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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

☒ **Quarterly Report Pursuant to Section 13 or 15 (d) of the Securities Exchange Act of 1934**

For the quarterly period ended June 30, 2018

or

☐ **Transition Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the Transition Period From _____ to _____ .

Commission File Number: 001-33093

LIGAND PHARMACEUTICALS INCORPORATED

(Exact name of registrant as specified in its charter)

Delaware	**77-0160744**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
3911 Sorrento Valley Boulevard, Suite 110 San Diego, CA	**92121**
(Address of principal executive offices)	**(Zip Code)**

(858) 550-7500

(Registrant's Telephone Number, Including Area Code)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one)

Large Accelerated Filer	☒	Accelerated Filer	☐
Non-Accelerated Filer	☐ (Do not check if a smaller reporting company)	Smaller Reporting Company	☐
Emerging Growth Company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of August 7, 2018, the registrant had 21,103,841 shares of common stock outstanding.

LIGAND PHARMACEUTICALS INCORPORATED
QUARTERLY REPORT

FORM 10-Q

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GLOSSARY OF TERMS AND ABBREVIATIONS

Abbreviation	Definition
2019 Notes	$245.0 million aggregate principal amount of convertible senior unsecured notes due 2019
2023 Notes	$750.0 million aggregate principal amount of convertible senior unsecured notes due 2023
ANDA	Abbreviated New Drug Application
Amgen	Amgen, Inc.
ASC	Accounting Standards Codification
ASU	Accounting Standards Update
Aziyo	Aziyo Med, LLC
CEO	Chief Executive Officer
Company	Ligand Pharmaceuticals Incorporated, including subsidiaries
CorMatrix	CorMatrix Cardiovascular, Inc.
CVR	Contingent value right
Crystal	Crystal Bioscience, Inc.
CyDex	CyDex Pharmaceuticals, Inc.
ESPP	Employee Stock Purchase Plan, as amended and restated
FASB	Financial Accounting Standards Board
FDA	Food and Drug Administration
GAAP	Generally accepted accounting principles in the United States
GRA	Glucagon receptor antagonist
Hovione	Hovione Farmaciencia
IPR&D	In-Process Research and Development
Ligand	Ligand Pharmaceuticals Incorporated, including subsidiaries
Metabasis	Metabasis Therapeutics, Inc.
NOLs	Net Operating Losses
Novartis	Novartis AG
OMT	OMT, Inc. or Open Monoclonal Technology, Inc.
Orange Book	Publication identifying drug products approved by the FDA based on safety and effectiveness
Q1 2008	The Company's fiscal quarter ended March 31, 2018
Q2 2018	The Company's fiscal quarter ended June 30, 2018
Q1 2017	The Company's fiscal quarter ended March 31, 2017
Q2 2017	The Company's fiscal quarter ended June 30, 2017
Retrophin	Retrophin Inc.
Roivant	Roivant Sciences GMBH
SEC	Securities and Exchange Commission
Selexis	Selexis, SA
Viking	Viking Therapeutics
WuXi	Wuxi Biologics
YTD	Year-to-date

PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

LIGAND PHARMACEUTICALS INCORPORATED
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited, in thousands, except share data)

	June 30, 2018	December 31, 2017
ASSETS		
Current assets:		
Cash and cash equivalents	$ 151,459	$ 20,620
Short-term investments	805,468	181,041
Investment in Viking	59,796	—
Accounts receivable, net	42,001	25,596
Inventory	9,520	4,373
Derivative asset	399,409	—
Other current assets	12,817	5,391
Total current assets	1,480,470	237,021
Deferred income taxes	44,586	84,422
Investment in Viking	—	6,438
Intangible assets, net	222,001	228,584
Goodwill	85,961	85,959
Commercial license rights, net	20,437	19,526
Property and equipment, net	4,187	4,212
Other assets	642	4,859
Total assets	$ 1,858,284	$ 671,021
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 2,682	$ 2,259
Accrued liabilities	9,312	7,377
Current contingent liabilities	7,495	4,703
Current deferred revenue, net	1,700	—
2019 convertible senior notes, net	210,370	224,529
Derivative liability	401,291	—
Total current liabilities	632,850	238,868
2023 convertible senior notes, net	595,912	
Long-term contingent liabilities	8,146	9,258
Other long-term liabilities	1,563	4,248
Total liabilities	1,238,471	252,374
Commitments and contingencies		
Equity component of currently redeemable convertible notes (Note 3)	—	18,859
Stockholders' equity:		
Common stock, $0.001 par value; 60,000,000 and 33,333,333 shares authorized; 21,095,174 and 21,148,665 shares issued and outstanding at June 30, 2018 and December 31, 2017, respectively	21	21
Additional paid-in capital	874,183	798,205
Accumulated other comprehensive (loss) income	(151)	2,486
Accumulated deficit	(254,240)	(400,924)
Total stockholders' equity	619,813	399,788
Total liabilities and stockholders' equity	$ 1,858,284	$ 671,021

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited)
(in thousands, except per share amounts)

	Three months ended June 30,		Six months ended June 30,	
	2018	**2017**	**2018**	**2017**
Revenues:				
Royalties	$ 31,396	$ 14,211	$ 52,216	$ 38,441
Material sales	7,612	5,550	12,003	6,672
License fees, milestones and other revenues	51,035	8,234	81,981	12,151
Total revenues	90,043	27,995	146,200	57,264
Operating costs and expenses:				
Cost of sales [1]	1,134	903	1,922	1,244
Amortization of intangibles	3,305	2,706	6,584	5,420
Research and development	6,135	4,822	13,540	13,495
General and administrative	9,294	6,549	16,938	13,872
Total operating costs and expenses	19,868	14,980	38,984	34,031
Income from operations	70,175	13,015	107,216	23,233
Other (expense) income:				
Gain (loss) from Viking	39,963	(1,400)	61,808	(2,406)
Interest income	2,762	481	3,637	835
Interest expense	(13,454)	(3,341)	(16,933)	(6,638)
Other expense, net	(3,867)	(455)	(4,835)	(531)
Total other income (expense), net	25,404	(4,715)	43,677	(8,740)
Income before income taxes	95,579	8,300	150,893	14,493
Income tax expense	(22,419)	(2,242)	(32,452)	(3,356)
Net income	$ 73,160	$ 6,058	$ 118,441	$ 11,137
Basic net income per share	$ 3.45	$ 0.29	$ 5.58	$ 0.53
Shares used in basic per share calculations	21,212	21,013	21,209	20,975
Diluted net income per share	$ 2.99	$ 0.26	$ 4.81	$ 0.48
Shares used in diluted per share calculations	24,438	23,216	24,618	23,117

(1) Excludes amortization of intangibles.

See accompanying notes.

LIGAND PHARMACEUTICALS INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Unaudited)
(in thousands)

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Net income:	$ 73,160	$ 6,058	$ 118,441	$ 11,137
Unrealized net gain (loss) on available-for-sale securities, net of tax	135	90	(14)	24
Less: Reclassification of net realized gain (loss) included in net income, net of tax	—	(136)	—	292
Comprehensive income	$ 73,295	$ 6,012	$ 118,427	$ 11,453

See accompanying notes.

LIGAND PHARMACEUTICAL INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited, in thousands)

	Six months ended June 30,	
	2018	**2017 (Revised)**
Operating activities		
Net income	$ 118,441	$ 11,137
Adjustments to reconcile net income to net cash provided by operating activities:		
Non-cash change in estimated fair value of contingent liabilities	2,730	966
Payments to CVR holders and other contingent payments	—	(4,998)
Depreciation and amortization	6,013	5,564
Amortization of debt discount and issuance fees	15,455	5,720
Stock-based compensation	9,367	10,669
Deferred income taxes	32,263	3,224
Change in fair value of the Viking convertible debt receivable and warrants	(8,450)	77
(Gain) / loss from equity investments	(53,689)	2,330
Royalties recorded in retained earnings upon adoption of ASU 606	32,707	—
Changes in operating assets and liabilities:		
Accounts receivable	(16,405)	1,263
Inventory	(4,395)	(4,286)
Accounts payable, accrued liabilities and Other	368	(2,056)
Net cash provided by operating activities	134,405	29,610
Investing activities		
Payments to CVR holders and other contingency payments	(1,000)	—
Purchase of short-term investments	(745,783)	(124,282)
Proceeds received from repayment of Viking note receivable	3,914	—
Proceeds received from repayment of commercial license rights	—	2,859
Proceeds from sale of short-term investments	12,791	83,268
Proceeds from maturity of short-term investments	110,175	51,887
Other	(416)	(199)
Net cash (used in) provided by investing activities	(620,319)	13,533
Financing activities		
Repayment of debt	(21,785)	—
Gross proceeds from issuance of 2023 Convertible Senior Notes	750,000	—
Payment of debt issuance costs	(16,900)	—
Proceeds from issuance of warrants	90,000	—
Purchase of convertible bond hedge	(140,250)	—
Net proceeds from stock option exercises and ESPP	11,849	2,370
Taxes paid related to net share settlement of equity awards	(3,434)	(4,042)
Share repurchase	(52,727)	—
Net cash provided by (used in) provided by financing activities	616,753	(1,672)
Net increase in cash and cash equivalents	130,839	41,471
Cash and cash equivalents at beginning of period	20,620	18,752
Cash and cash equivalents at end of period	$ 151,459	$ 60,223
Supplemental disclosure of cash flow information		
Interest paid	$ 919	$ 919
Taxes paid	$ 285	$ 132
Supplemental schedule of non-cash activity		
Accrued fixed asset purchases	$ 66	$ —
Accrued inventory purchases	$ 752	$ —
Unrealized gain on AFS investments	$ —	$ 24
Excess of conversion value over the principal amount of 2019 Notes paid in shares	$ (31,571)	$ —
Value of shares reacquired under convertible bond hedge transaction entered into with 2019 Notes	$ 31,571	$ —

See accompanying notes

LIGAND PHARMACEUTICALS INCORPORATED
Notes to Condensed Consolidated Financial Statements
(Unaudited)

1. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation

The Company's condensed consolidated financial statements include the financial statements of Ligand and its wholly-owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation. We have included all adjustments, consisting only of normal recurring adjustments, which we considered necessary for a fair presentation of our financial results. These unaudited condensed consolidated financial statements and accompanying notes should be read together with the audited consolidated financial statements included in the Company's Annual Report on Form 10-K for the year ended December 31, 2017. Interim financial results are not necessarily indicative of the results that may be expected for the full year.

Reclassifications

Certain amounts in the prior period combined financial statements have been reclassified to conform with the current period presentation.

Significant Accounting Policies

The Company describes its significant accounting policies in Note 1 to the financial statements in Item 8 of our Annual Report on Form 10-K for the year ended December 31, 2017.

Use of Estimates

The preparation of condensed consolidated financial statements in conformity with GAAP requires the use of estimates and assumptions that affect the amounts reported in the condensed consolidated financial statements and the accompanying notes. Actual results may differ from those estimates.

Accounting Standards Recently Adopted

Revenue Recognition - In May 2014, the FASB issued new guidance related to revenue recognition, ASU 2014-09, Revenue from Contracts with Customers ("ASC 606"), which outlines a comprehensive revenue recognition model and supersedes most current revenue recognition guidance. The new guidance requires a company to recognize revenue upon transfer of goods or services to a customer at an amount that reflects the expected consideration to be received in exchange for those goods or services. ASC 606 defines a five-step approach for recognizing revenue, which may require a company to use more judgment and make more estimates than under the current guidance. We adopted this new standard as of January 1, 2018, by using the modified-retrospective method.

Financial Instruments - In January 2016, the FASB issued ASU 2016-01, Financial Instruments - Overall (Subtopic 825-10), which requires equity investments (other than those accounted for under the equity method or those that result in consolidation) to be measured at fair value, with changes in fair value recognized in net income. We have strategic investments, including Viking, that fall under this guidance update. We have adopted ASU 2016-01 effective January 1, 2018 as a cumulative-effect adjustment and reclassified $2.6 million unrealized gains on equity investments, net of tax, from accumulated other comprehensive income to accumulated deficit on our consolidated balance sheet. Effective January 1, 2018, our results of operations include the changes in fair value of these financial instruments. See *Viking* subsection below for further information on the Viking investment.

Statement of Cash Flows - In August 2016 the FASB issued ASU No. 2016-15 Statement of Cash Flows (Topic 230), Classification of Certain Cash Receipts and Cash Payments. The new standard clarifies certain aspects of the statement of cash flows, and aims to reduce diversity in practice regarding how certain transactions are classified in the statement of cash flows. This standard was effective January 1, 2018. The Company adopted ASU No. 2016-15 effective January 1, 2018. We have updated our presentation of payments to CVR holders and other contingency payments to conform to the standard and have revised our prior year cash flows accordingly.

Accounting Standards Not Yet Adopted

Financial Instruments - In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments, which amends the impairment model by requiring entities to use a forward-looking approach based on expected losses to estimate credit losses on certain types of financial instruments, including trade receivables and available for sale debt securities. The ASU is effective for us beginning in the first quarter of 2020, with early adoption permitted. We are currently evaluating the impact of ASU 2016-13 on the consolidated financial statements.

We do not believe that any other recently issued, but not yet effective accounting pronouncements, if adopted, would have a material impact on our consolidated financial statements or disclosures.

Revenue

Our revenue is generated primarily from royalties on sales of products commercialized by the Company's partners, Captisol material sales, license fees and development and regulatory milestone payments.

On January 1, 2018, we adopted ASC 606 which amends the guidance for recognition of revenue from contracts with customers by using the modified-retrospective method applied to those contracts that were not completed as of January 1, 2018. The results for reporting periods beginning January 1, 2018, are presented in accordance with the new standard, although comparative information has not been restated and continues to be reported under the accounting standards and policies in effect for those periods. See Note 1, Summary of significant accounting policies, to the consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2017 for the accounting associated with revenue prior to the adoption of ASC 606.

Upon adoption, we recorded a net decrease of $25.4 million to accumulated deficit due to the cumulative impact of adopting the new standard—with the impact related primarily to the acceleration of royalty revenue, net of related deferred tax impact. The adoption of this new standard resulted in higher reported total revenues and operating income in the second quarter of 2018 of $10.4 million and lower reported total revenue and operating income in the first half of 2018 of $1.5 million, compared to what reported amounts would have been under the prior standard. Our accounting policies under the new standard were applied prospectively and are noted below.

Royalties, License Fees and Milestones

We receive royalty revenue on sales by our partners of products covered by patents that we own. We do not have future performance obligations under these license arrangements. We generally satisfy our obligation to grant intellectual property rights on the effective date of the contract. However, we apply the royalty recognition constraint required under the guidance for sales-based royalties which requires a sales-based royalty to be recorded no sooner than the underlying sale. Therefore, royalties on sales of products commercialized by the Company’s partners are recognized in the quarter the product is sold. Our partners generally report sales information to us on a one quarter lag. Thus, we estimate the expected royalty proceeds based on an analysis of historical experience and interim data provided by our partners including their publicly announced sales. Differences between actual and estimated royalty revenues are adjusted for in the period in which they become known, typically the following quarter. Our royalty revenue estimates recorded in the first quarter of 2018 did not differ materially from actual results.

Our contracts with customers often will include future contingent milestone based payments. We include contingent milestone based payments in the estimated transaction price when there is a basis to reasonably estimate the amount of the payment. These estimates are based on historical experience, anticipated results and our best judgment at the time. If the contingent milestone based payment is sales-based we apply the royalty recognition constraint and record revenue when the underlying sale has taken place. Significant judgments must be made in determining the transaction price for our sales of intellectual property. Because of the risk that products in development with our partners will not reach development based milestones or receive regulatory approval, we generally recognize any contingent payments that would be due to us upon or after the development milestone or regulatory approval.

Material Sales

We recognize revenue when control of Captisol material or intellectual property license rights is transferred to our customers in an amount that reflects the consideration we expect to receive from our customers in exchange for those products. This process involves identifying the contract with a customer, determining the performance obligations in the contract, determining the contract price, allocating the contract price to the distinct performance obligations in the contract, and recognizing revenue

when the performance obligations have been satisfied. A performance obligation is considered distinct from other obligations in a contract when it provides a benefit to the customer either on its own or together with other resources that are readily available to the customer and is separately identified in the contract. We consider a performance obligation satisfied once we have transferred control of the product, meaning the customer has the ability to use and obtain the benefit of the Captisol material or intellectual property license right. We recognize revenue for satisfied performance obligations only when we determine there are no uncertainties regarding payment terms or transfer of control. Sales tax and other taxes we collect concurrent with revenue-producing activities are excluded from revenue. We expense incremental costs of obtaining a contract when incurred if the expected amortization period of the asset that we would have recognized is one year or less or the amount is immaterial. We did not incur any incremental costs of obtaining a contract during the periods reported.

Depending on the terms of the arrangement, we may also defer a portion of the consideration received because we have to satisfy a future obligation. We use an observable price to determine the stand-alone selling price for separate performance obligations or a cost plus margin approach when one is not available. We have elected to recognize the cost for freight and shipping when control over Captisol material has transferred to the customer as an expense in cost of sales.

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (contract liabilities) on the Consolidated Balance Sheet. Except for royalty revenue, we generally receive payment at the point we satisfy our obligation or soon after. Therefore, we do not generally carry a contract asset or contract liability balance.

The Company has revenue sharing arrangements whereby certain revenue proceeds are shared with a third party. The revenue standard requires an entity to determine whether it is a principal or an agent in these transactions by evaluating the nature of its promise to the customer. The Company received a $4.6 million milestone payment from a license partner in the first six months of 2018 of which $3.0 million was paid to a third-party in-licensor. The Company recorded net revenue of $1.6 million as it believes it was an agent in the transaction. The Company records amounts due to third-party in-licensors as general and administrative expenses when it is the principal in the transaction.

Disaggregation of Revenue

Under ASC 605, the legacy revenue standard, the Company would have reported total royalty revenue of $21.1 million in the second quarter of 2018, disaggregated as follows: Promacta $15.6 million, Kyprolis $3.4 million, Evomela $1.6 million and Other $0.5 million. In 2017 royalty revenue continues to be reported in accordance with ASC 605 and was $14.2 million for the second quarter of 2017 or disaggregated as follows: Promacta $9.7 million, Kyprolis $2.9 million, Evomela, $1.3 million and Other $0.3 million and $38.4 million for the first half of 2017 or disaggregated as follows: Promacta $26.4 million, Kyprolis $7.5 million, Evomela $3.1 million and Other $1.4 million. Under ASC 606, royalty revenue was $31.4 million in second quarter of 2018 or disaggregated as follows: Promacta $24.8 million, Kyprolis $4.7 million, Evomela $1.2 million and Other $0.7 million and $52.2 million the first half of 2018 or disaggregated as follows: Promacta $40.4 million, Kyprolis $8.1 million, Evomela $2.8 million and Other $0.9 million.

The following table represents disaggregation of Material Sales and License fees, milestone and other (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Material Sales				
Captisol	$ 7,612	$ 5,550	$ 12,003	$ 6,672
License fees, milestones and other				
License Fees	$ 47,981	$ 666	$ 74,936	$ 3,538
Milestone	1,919	4,497	4,744	5,505
Other	1,135	3,071	2,301	3,108
	$ 51,035	$ 8,234	$ 81,981	$ 12,151

Short-term Investments

The Company's investments consist of the following at June 30, 2018 and December 31, 2017 (in thousands):

	June 30, 2018				December 31, 2017			
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Estimated fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Estimated fair value
Short-term investments								
Bank deposits	$ 361,826	$ 36	$ (79)	$ 361,783	$ 80,095	$ 6	$ (42)	$ 80,059
Corporate bonds	84,275	1	(138)	84,138	55,335	—	(96)	55,239
Commercial paper	243,544	10	(12)	243,542	27,933	—	(20)	27,913
U.S. Government bonds	112,403	14	(20)	112,397	8,939	—	(10)	8,929
Agency bonds	—	—	—	—	4,991	—	(1)	4,990
Municipal bonds	2,023	—	(13)	2,010	2,028	—	(13)	2,015
Corporate equity securities	135	1,463	—	1,598	207	1,689	—	1,896
	$ 804,206	$ 1,524	$ (262)	$ 805,468	$ 179,528	$ 1,695	$ (182)	$ 181,041

Inventory

Inventory, which consists of finished goods, is stated at the lower of cost or market value. The Company determines cost using the first-in, first-out method.

Goodwill and Other Identifiable Intangible Assets

Goodwill and other identifiable intangible assets consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Indefinite lived intangible assets		
IPR&D	$ 2,410	$ 7,923
Goodwill	85,961	85,959
Definite lived intangible assets		
Complete technology	228,413	222,900
Less: accumulated amortization	(29,078)	(23,301)
Trade name	2,642	2,642
Less: accumulated amortization	(982)	(916)
Customer relationships	29,600	29,600
Less: accumulated amortization	(11,004)	(10,264)
Total goodwill and other identifiable intangible assets, net	$ 307,962	$ 314,543

Commercial License Rights

Commercial license rights consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Aziyo and CorMatrix	$ 17,696	$ 17,696
Selexis	8,602	8,602
	$ 26,298	$ 26,298
Less: accumulated amortization	(5,861)	(6,772)
Total commercial rights, net	$ 20,437	$ 19,526

Commercial license rights represent a portfolio of future milestone and royalty payment rights acquired from Selexis in April 2013 and April 2015 and CorMatrix in May 2016. Individual commercial license rights acquired are carried at allocated cost and approximate fair value. In May 2017, the Company entered into a Royalty Agreement with Aziyo pursuant to which the Company will receive royalties from certain marketed products that Aziyo acquired from CorMatrix. The Company accounts for the Aziyo commercial license right as a financial asset in accordance with ASC 310 and amortizes the commercial license right using the "effective interest" method whereby the Company forecasts expected cash flows over the term of the arrangement to arrive at an annualized effective interest. The annual effective interest associated with the forecasted cash flows from the Royalty Agreement with Aziyo as of June 30, 2018 is 26%. Revenue is calculated by multiplying the carrying value of the commercial license right by the effective interest.

Viking

The Company's equity ownership interest in Viking decreased in the first quarter of 2018 to approximately 12.4% due to Viking's financing events in February 2018. As a result, in February 2018, the Company concluded that it did not exert significant influence over Viking and discontinued accounting for its investment in Viking under the equity method. The market value of the Company's equity investment in Viking was $59.8 million as of June 30, 2018 and as a result the Company recorded an unrealized gain of $32.3 million and $53.5 million in Gain (loss) from Viking in its condensed consolidated statement of operations for the three and six months ended June 30, 2018, respectively.

The Company also has outstanding warrants to purchase 1.5 million shares of Viking's common stock at an exercise price of $1.50 per share. The Company recorded the warrants at fair value of $12.3 million and $3.8 million at June 30, 2018 and December 31, 2017, respectively. As a result, the Company recorded an unrealized gain of $7.7 million and $8.5 million in Gain (loss) from Viking in its condensed consolidated statement of operations for the three and six months ended June 30, 2018, respectively.

Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	June 30, 2018	December 31, 2017
Compensation	$ 3,166	$ 4,085
Professional fees	367	430
Amounts owed to former licensees	468	396
Royalties owed to third parties	2,245	954
Other	3,066	1,512
Total accrued liabilities	$ 9,312	$ 7,377

Stock-Based Compensation

Stock-based compensation expense for awards to employees and non-employee directors is recognized on a straight-line basis over the vesting period until the last tranche vests. The following table summarizes stock-based compensation expense recorded as components of research and development expenses and general and administrative expenses for the periods indicated (in thousands):

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Stock-based compensation expense as a component of:				
Research and development expenses	$ 2,096	$ 1,928	$ 3,863	$ 5,867
General and administrative expenses	2,716	2,696	5,504	4,802
	$ 4,812	$ 4,624	$ 9,367	$ 10,669

The fair-value for options that were awarded to employees and directors was estimated at the date of grant using the Black-Scholes option valuation model with the following weighted-average assumptions:

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Risk-free interest rate	2.8%	2.1%	2.8%	2.1%
Dividend yield	—	—	—	—
Expected volatility	36%	47%	34%	47%
Expected term	5.8	6.5	5.7	6.8

Derivatives

In May 2018, the Company issued $750 million aggregate principal amount of 0.75% convertible senior notes (the '2023 Notes') as further described in “Footnote 3. Convertible Senior Notes.” Concurrently with the issuance of the notes, the Company entered into a series of convertible note hedge and warrant transactions which in combination are designed to reduce the potential dilution to the Company's stockholders and/or offset the cash payments the Company is required to make in excess of the principal amount upon conversion of the notes. The conversion option associated with the 2023 Notes temporarily met the criteria for an embedded derivative liability which required bifurcation and separate accounting. In addition, the note hedge and warrants were also temporarily classified as a derivative asset and liability, respectively, on the Company’s consolidated balance sheet. As a result of shareholder approval to increase the number of authorized shares of the Company's common stock on June 19, 2018, as discussed in “Footnote 3. Convertible Senior Notes” the derivative asset and liabilities were reclassified to additional paid-in capital. Changes in the fair value of these derivatives were reflected in Other expense, net in our Condensed Consolidated Statements of Operations.

The following table summarizes the inputs and assumptions used in the Black-Scholes model to calculate the fair value of the assets and the inputs and assumptions used in the Binomial model to calculate the fair value of the derivative liabilities associated with the 2023 Notes:

	As of May, 22 2018	As of June 19, 2018
Common stock price	$187.09	$195.91
Exercise price, conversion premium and bond hedge	$248.48	$248.48
Exercise price, warrant	$315.38	$315.38
Risk-free interest rate	2.9%	2.8%
Volatility	30%-35%	30%-35%
Dividend yield	—	—
Annual coupon rate	0.75%	0.75%
Remaining contractual term (in years)	5.00	4.98

In addition, on May 22, 2018, the Company amended its 2019 Notes making an irrevocable election to settle the entire note in cash. As a result, the Company reclassified from equity to derivative liability the fair value of the conversion premium as of May 22, 2018. Amounts paid in excess of the principal amount will be offset by an equal receipt of cash under the corresponding convertible bond hedge. As a result, the Company reclassified from equity to derivative asset the fair value of the bond hedge as of May 22, 2018. The Company engaged a third-party valuation firm with expertise in valuing financial instruments to determine the fair value of the conversion option derivative liability and bond hedge derivative asset. Changes in the fair value of these derivatives are reflected in Other expense, net in our Condensed Consolidated Statements of Operations.

The following table summarizes the inputs and assumptions used in the Black-Scholes model to calculate the fair value of the derivative assets and the inputs and assumptions used in the Binomial model to calculate the fair value of the derivative liability associated with the 2019 Notes:

	As of May, 22 2018	As of June 30, 2018
Common stock price	$187.09	$207.17
Exercise price, conversion premium and bond hedge	$75.05	$75.05
Risk-free interest rate	2.47%	2.43%
Volatility	30%-35%	30%-35%
Dividend yield	—	—
Annual coupon rate	0.75%	0.75%
Remaining contractual term (in years)	1.25	1.14

Lease Obligations

The Company describes its operating lease obligations in Note 5 to the financial statements in Item 8 of its Annual Report on Form 10-K for the year ended December 31, 2017. There were no significant changes in the Company's operating lease commitments during the first six months of 2018.

Income Per Share

Basic income per share is calculated by dividing net income by the weighted-average number of common shares outstanding during the period. Diluted income per share is computed based on the sum of the weighted average number of common shares and potentially dilutive common shares outstanding during the period.

Potentially dilutive common shares consist of shares issuable under the 2023 Notes, warrants associated with the 2019 Notes and 2023 Notes, stock options and restricted stock. The 2023 Notes have a dilutive impact when the average market price of the Company’s common stock exceeds the applicable conversion price of the notes. The 2019 Notes were amended to require cash settlement of the conversion premium for conversion notices received after May 22, 2018 and therefore do not have a dilutive impact subsequent to May 22, 2018. The warrants have a dilutive effect to the extent the market price per share of common stock exceeds the applicable exercise price of the warrants. Potentially dilutive common shares from stock options and restricted stock are determined using the average share price for each period under the treasury stock method. In addition, proceeds from exercise of stock options and the average amount of unrecognized compensation expense for restricted stock are assumed to be used to repurchase shares. In loss periods, basic net loss per share and diluted net loss per share are identical because the otherwise dilutive potential common shares become anti-dilutive and are therefore excluded.

The following table presents the calculation of weighted average shares used to calculate basic and diluted earnings per share:

	Three months ended June 30,		Six months ended June 30,	
	2018	2017	2018	2017
Weighted average shares outstanding:	21,211,877	21,012,611	21,209,467	20,974,738
Dilutive potential common shares:				
Restricted stock	59,605	156,054	61,782	170,900
Stock options	1,132,781	967,533	1,126,196	961,021
2019 Convertible Senior Notes	1,051,852	1,079,702	1,385,475	1,010,505
Warrants	981,807	—	835,329	—
Shares used to compute diluted income per share	24,437,922	23,215,900	24,618,249	23,117,164
Potentially dilutive shares excluded from calculation due to anti-dilutive effect	2,091,908	3,811,813	1,120,156	3,761,440

2. Fair Value Measurements

The following table presents the Company's hierarchy for assets and liabilities measured at fair value.

	June 30, 2018				December 31, 2017			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Assets:								
Short-term investments[1]	$ 61,393	$ 803,871	$ —	$ 865,264	$ 1,896	$ 179,145	$ —	$ 181,041
Note receivable Viking	—	—	—	—	—	—	3,877	3,877
Investment in warrants [2]	12,296	—	—	12,296	3,846	—	—	3,846
Total assets	$ 73,689	$ 803,871	$ —	$ 877,560	$ 5,742	$ 179,145	$ 3,877	$ 188,764
Liabilities:								
Current portion of contingent liabilities - Crystal [3]	$ —	$ —	$ 3,618	$ 3,618	$ —	$ —	$ 4,618	4,618
Current contingent liabilities-CyDex [4]	—	—	36	36	—	—	86	86
Long-term portion of contingent liabilities - Crystal [3]	—	—	3,784	3,784	—	—	3,783	3,783
Long-term contingent liabilities-CyDex [4]	—	—	1,503	1,503	—	—	1,503	1,503
Long-term contingent liabilities-Metabasis [5]	—	2,859	—	2,859	—	3,971	—	3,971
Total liabilities	$ —	$ 2,859	$ 8,941	$ 11,800	$ —	$ 3,971	$ 9,990	$ 13,961

(1) Investments in equity securities, which the Company received from Viking and another licensee as upfront and event-based payments, are classified as level 1 as the fair value is determined using quoted market prices in active markets for the same securities. Short-term investments in marketable debt securities with maturities greater than 90 days are classified as level 2 of the fair value hierarchy, as these investment securities are valued based upon quoted prices for identical or similar instruments in markets that are not active, and model-based valuation techniques for which all significant assumptions are observable in the market.

(2) Investment in warrants, which the Company received as a result of Viking's partial repayment of the Viking note receivable and the Company's purchase of Viking common stock and warrants in April 2016, are classified as level 1 as the fair value is determined using quoted market prices in active markets for the same securities. The change of the fair value is recorded in Gain (loss) from Viking in the Company's condensed consolidated statement of operations.

(3) The fair value of Crystal contingent liabilities was determined using a probability weighted income approach. Most of the contingent payments are based on development or regulatory milestones as defined in the merger agreement with Crystal. The fair value is subjective and is affected by changes in inputs to the valuation model including management's estimates regarding the timing and probability of achievement of certain developmental and regulatory milestones. At June 30, 2018, most of the development and regulatory milestones were estimated to be highly probable of being achieved between 2018 and 2019. Changes in these estimates may materially affect the fair value.

(4) The fair value of the liabilities for CyDex contingent liabilities were determined based on the income approach. To the extent the estimated future income may vary significantly given the long-term nature of the estimate, the Company utilizes a Monte Carlo model. The fair value is subjective and is affected by changes in inputs to the valuation model including management's estimates of timing and probability of achievement of certain revenue thresholds and developmental and regulatory milestones which may be achieved and affect amounts owed to former license holders. Changes in these assumptions can materially affect the fair value estimate.

(5) The liability for CVRs for Metabasis are determined using quoted prices in a market that is not active for the underlying CVR. At June 30, 2018, the Company has a CVR payable of $3.8 million to the Glucagon CVR holders due on July 2, 2018, which is not included in the fair value disclosure.

For the three months ended June 30, 2018, there was no change to the fair value of the contingent liabilities associated with CyDex or Crystal. The Company made a $1.0 million payment to the former shareholders of Crystal in the first quarter of 2018.

The following table represents significant unobservable inputs used in determining the fair value of contingent liabilities assumed in the acquisition of CyDex:

	June 30, 2018	December 31, 2017
Revenue volatility	25%	25%
Average probability of commercialization	12.5%	12.5%
Market price of risk	2.9%	2.9%

3. Convertible Senior Notes

0.75% Convertible Senior Notes due 2019

In August 2014, the Company issued $245.0 million aggregate principal amount of 2019 Notes. The implied estimated effective rate of the liability component of the 2019 Notes was 5.83% and are convertible into common stock at an initial conversion rate of 13.3251 shares per $1,000 principal amount of 2019 Notes, subject to adjustment upon certain events, which is equivalent to an initial conversion price of approximately $75.05 per share of common stock. The notes bear cash interest at a rate of 0.75% per year, payable semi-annually.

Holders of the 2019 Notes may convert the notes at any time prior to the close of business on the business day immediately preceding May 15, 2019, under any of the following circumstances:

(1) during any fiscal quarter (and only during such fiscal quarter) commencing after December 31, 2014, if, for at least 20 trading days (whether or not consecutive) during the 30 consecutive trading day period ending on the last trading day of the immediately preceding fiscal quarter, the last reported sale price of the Company's common stock on such trading day is greater than 130% of the conversion price on such trading day;

(2) during the five business day period immediately following any 10 consecutive trading day period, in which the trading price per $1,000 principal amount of notes was less than 98% of the product of the last reported sale price of the Company's common stock on such trading day and the conversion rate on each such trading day; or

(3) upon the occurrence of certain specified corporate events as specified in the indenture governing the notes.

As of June 30, 2018, the Company's last reported sale price has exceeded the 130% threshold described above and accordingly the 2019 Notes have been classified as a current liability as of June 30, 2018. Upon conversion, the Company must deliver cash to settle the principal and may deliver cash or shares of common stock, at its option, to settle any premium due upon conversion for any conversion notices received prior to May 22, 2018. And, as per a supplemental indenture entered into on May 22, 2018, the Company made an irrevocable election to settle the entire note in cash. As such, the Company must deliver cash to settle the principal and any premium due upon conversion for any conversion notices received on or after May 22, 2018.

As a result of the requirement to deliver cash to settle any premium due upon conversion, on May 22, 2018, the Company reclassified from equity to liability the conversion option fair value of $341.6 million. In accordance with ASC 815, the derivative was adjusted to its fair value as of June 30, 2018 of $401.3 million with the resulting $59.7 million increase reflected in Other expense, net in our Condensed Consolidated Statements of Operations for the three and six months ended June 30, 2018.

In March and April 2018, the Company received notices for conversion of $21.8 million of principal amount of the 2019 Notes which were settled in May and June 2018. The Company paid the noteholders the conversion value of the notes in cash, up to the principal amount of the 2019 Notes. The excess of the conversion value over the principal amount, totaling $31.6 million, was paid in shares of common stock. This equity dilution upon conversion of the 2019 Notes was offset by the reacquisition of the shares under the convertible bond hedge transactions entered into in connection with the offering of the 2019 Notes as further discussed below. As a result of the conversions the Company recorded a $0.6 million loss on extinguishment of debt calculated as the difference between the estimated fair value of the debt and the carrying value of the 2019 Notes as of the settlement dates. To measure the fair value of the converted 2019 Notes as of the settlement dates, the applicable interest rates were estimated using Level 2 observable inputs and applied to the converted notes using the same methodology as in the issuance date valuation.

In July 2018, the Company received notices for conversion of $64.7 million in principal of 2019 Convertible Senior Notes which are expected to settle in October 2018.

Convertible Bond Hedge and Warrant Transactions

In August 2014, the Company entered into convertible bond hedges and sold warrants covering 3,264,643 shares of its common stock to minimize the impact of potential dilution to the Company's stockholders and/or offset the cash payments the Company is required to make in excess of the principal amount upon conversion of the 2019 Notes.

The convertible bond hedges have an exercise price of $75.05 per share and are exercisable when and if the 2019 Notes are converted. If upon conversion of the 2019 Notes, the price of the Company's common stock is above the exercise price of the convertible bond hedges, the counterparties will deliver shares of common stock and/or cash with an aggregate value equal to the difference between the price of common stock at the conversion date and the exercise price, multiplied by the number of shares of common stock related to the convertible bond hedge transaction being exercised. The convertible bond hedges and warrants described below are separate transactions entered into by the Company and are not part of the terms of the 2019 Convertible Senior Notes. Holders of the 2019 Convertible Senior Notes and warrants will not have any rights with respect to the convertible bond hedges. The Company paid $48.1 million for these convertible bond hedges and recorded the amount as a reduction to additional paid-in capital.

Conversion notices received after May 22, 2018 relating to the 2019 Notes must be fully settled in cash and amounts paid in excess of the principal amount will be offset by an equal receipt of cash under the convertible bond hedge. As a result of the irrevocable cash election, on May 22, 2018, the Company reclassified from equity to derivative asset the remaining bond hedge fair value of $340.0 million and marked it to market as of June 30, 2018 to $399.4 million with the resulting $59.4 million increase reflected in Other expense, net, in our Condensed Consolidated Statements of Operations for the three and six months ended June 30, 2018.

Concurrently with the convertible bond hedge transactions, the Company entered into warrant transactions whereby it sold warrants to acquire approximately 3,264,643 shares of common stock with an exercise price of approximately $125.08 per share, subject to certain adjustments. The warrants have various expiration dates ranging from November 13, 2019 to April 22, 2020. The warrants will have a dilutive effect to the extent the market price per share of common stock exceeds the applicable exercise price of the warrants, as measured under the terms of the warrant transactions. The Company received $11.6 million for these warrants and recorded this amount to additional paid-in capital. The common stock issuable upon exercise of the warrants will be in unregistered shares, and the Company does not have the obligation and does not intend to file any registration statement with the Securities and Exchange Commission registering the issuance of the shares under the warrants. The Company continues to have the ability to avoid settling the warrants associated with the 2019 Notes in cash after May 22, 2018. Accordingly, the warrants continue to be classified in additional paid in capital.

0.75% Convertible Senior Notes due 2023

In May 2018, the Company issued $750 million aggregate principal amount of 0.75% convertible senior notes. The net proceeds from the offering, after deducting the initial purchasers' discount and offering expenses, were approximately $733.1 million. The 2023 Notes will be convertible into cash, shares of common stock, or a combination of cash and shares of common stock, at the Company's election, based on an initial conversion rate, subject to adjustment, of 4.0244 shares per $1,000 principal amount of the 2023 Notes which represents an initial conversion price of approximately $248.48 per share.

Holders of the 2023 Notes may convert the notes at any time prior to the close of business on the business day immediately preceding November 15, 2022, under any of the following circumstances:

(1) during any fiscal quarter (and only during such fiscal quarter) commencing after September 30, 2018, if, for at least 20 trading days (whether or not consecutive) during the 30 consecutive trading day period ending on the last trading day of the immediately preceding fiscal quarter, the last reported sale price of the Company's common stock on such trading day is greater than 130% of the conversion price on such trading day;

(2) during the five business day period immediately following any 10 consecutive trading day period, in which the trading price per $1,000 principal amount of notes was less than 98% of the product of the last reported sale price of the Company's common stock on such trading day and the conversion rate on each such trading day; or

(3) upon the occurrence of certain specified corporate events as specified in the indenture governing the notes.

At the May 22, 2018 issuance date of the 2023 Notes, the Company did not have the necessary number of authorized but unissued shares of its common stock available to settle the conversion option of the 2023 Notes in shares. Therefore, in accordance with guidance found in ASC 815-15 – Embedded Derivatives, the conversion option of the Notes was deemed an embedded derivative requiring bifurcation from the 2023 Notes (host contract) and separate accounting as a derivative liability. The fair value of the conversion option derivative liability at May 22, 2018 was $144.0 million, which was recorded as a reduction to the carrying value of the debt. This debt discount will be amortized to interest expense over the term of the debt using the effective interest method. Up to the date in which the Company received shareholder approval on June 19, 2018 to increase the authorized number of shares of the Company's common stock, the conversion option was accounted for as a liability with the resulting change in fair value of $13.5 million during that period reflected in Other expense, net in our Condensed Consolidated Statements of Operations for the three and six months ended June 30, 2018. As of June 30, 2018, the debt discount remains and continues to be amortized to interest expense.

The notes will have a dilutive effect to the extent the average market price per share of common stock for a given reporting period exceeds the conversion price of $248.48. As of June 30, 2018, the "if-converted value" did not exceed the principal amount of the 2023 Notes.

In connection with the issuance of the 2023 Notes, the Company incurred $16.9 million of issuance costs, which primarily consisted of underwriting, legal and other professional fees. The portion of these costs allocated to the conversion option totaling $3.2 million was recorded as interest expense for the three and six months ended June 30, 2018. The portion of these costs allocated to the liability component totaling $13.7 million is amortized to interest expense using the effective interest method over the five year expected life of the 2023 Notes.

It is the Company's intent and policy to settle conversions through combination settlement, which essentially involves payment in cash equal to the principal portion and delivery of shares of common stock for the excess of the conversion value over the principal portion.

Convertible Bond Hedge and Warrant Transactions

In conjunction with the 2023 Notes, in May 2018, the Company entered into convertible bond hedges and sold warrants covering 3,018,327 shares of its common stock to minimize the impact of potential dilution to the Company's common stock and/or offset the cash payments the Company is required to make in excess of the principal amount upon conversion of the 2023 Notes. The convertible bond hedges have an exercise price of $248.48 per share and are exercisable when and if the 2023 Notes are converted. The Company paid $140.3 million for these convertible bond hedges. If upon conversion of the 2023 Notes, the price of the Company's common stock is above the exercise price of the convertible bond hedges, the counterparties will deliver shares of common stock and/or cash with an aggregate value approximately equal to the difference between the price of common stock at the conversion date and the exercise price, multiplied by the number of shares of common stock related to the convertible bond hedge transaction being exercised. The convertible bond hedges and warrants described below are separate transactions entered into by the Company and are not part of the terms of the 2023 Notes. Holders of the 2023 Notes and warrants will not have any rights with respect to the convertible bond hedges.

Concurrently with the convertible bond hedge transactions, the Company entered into warrant transactions whereby it sold warrants covering approximately 3,018,327 shares of common stock with an exercise price of approximately $315.38 per share, subject to certain adjustments. The Company received $90.0 million for these warrants. The warrants have various expiration dates ranging from August 15, 2023 to February 6, 2024. The warrants will have a dilutive effect to the extent the market price per share of common stock exceeds the applicable exercise price of the warrants, as measured under the terms of the warrant transactions. The common stock issuable upon exercise of the warrants will be in unregistered shares, and the Company does not have the obligation and does not intend to file any registration statement with the Securities and Exchange Commission registering the issuance of the shares under the warrants.

For the period from May 22, 2018, the issuance date of the bond hedge and warrant transactions, to June 19, 2018, the date shareholders approved an increase in the Company's authorized shares of common stock, the bond hedges and warrants required cash settlement and were accounted for as a derivative asset and liability, respectively, with the resulting increase in fair value of $19.2 million and $7.5 million during that period reflected in Other expense, net in our Condensed Consolidated Statements Of Operations for the three and six months ended June 30, 2018.

The following table summarizes information about the equity and liability components of the 2019 Notes and 2023 Notes (in thousands).

	June 30, 2018	December 31, 2017
Principal amount of 2019 Notes outstanding	$ 223,215	$ 245,000
Unamortized discount (including unamortized debt issuance cost)	(12,845)	(20,471)
Total current portion of notes payable	$ 210,370	$ 224,529
Principal amount of 2023 Notes outstanding	$ 750,000	$ —
Unamortized discount (including unamortized debt issuance cost)	(154,088)	—
Total long-term portion of notes payable	$ 595,912	$ —
Carrying value of equity component of 2023 Notes	$ 143,986	$ —
Fair value of convertible senior notes outstanding (Level 2)	$ 1,389,800	$ 446,360

4. Income Tax

The Company's effective tax rate may vary from the U.S. federal statutory tax rate due to the change in the mix of earnings in various state jurisdictions with different statutory rates, benefits related to tax credits, and the tax impact of non-deductible expenses, stock award activities and other permanent differences between income before income taxes and taxable income. The effective tax rate for the three and six months ended June 30, 2018 was 23% and 22%, respectively. Our tax rate for the second quarter of 2018 did not differ significantly from the combined federal and state statutory rate. The variance from the U.S. federal statutory tax rate of 21% for the first six months of 2018 was primarily attributable to tax deductions related to stock award activities which were recorded as discrete items as well as the release of a valuation allowance relating to our investment in Viking. The effective tax rate for the three and six months ended June 30, 2017 was 27% and 23%. The variance from the U.S. federal statutory tax rate of 35% was primarily attributable to tax deductions related to stock award activities which were recorded as discrete items in the quarter.

The Company continues to evaluate the impact of the U.S. Tax Cuts and Jobs Act (Tax Act) and has not adjusted its provisional tax estimates related to the Tax Act that it recorded in the fourth quarter of 2017. The Company's accounting remains incomplete as of June 30, 2018 and will be refined and, if necessary, adjusted throughout 2018 as required by SEC Staff Accounting Bulletin No. 118 (SAB 118).

5. Stockholders' Equity

The Company grants options and awards to employees and non-employee directors pursuant to a stockholder approved stock incentive plan, which is described in further detail in Note 8, Stockholders' Equity, of Notes to Consolidated Financial Statements in the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017.

The following is a summary of the Company's stock option and restricted stock activity and related information:

	Stock Options		Restricted Stock Awards	
	Shares	Weighted-Average Exercise Price	Shares	Weighted-Average Grant Date Fair Value
Balance as of December 31, 2017	1,876,332	$ 53.17	133,294	$ 91.60
Granted	224,312	161.83	62,033	169.91
Options exercised/RSUs vested	(188,998)	61.78	(57,497)	82.79
Forfeited	(12,228)	104.54	(1,165)	125.16
Balance as of June 30, 2018	1,899,418	$ 64.81	136,665	$ 130.57

As of June 30, 2018, outstanding options to purchase 1.4 million shares were exercisable with a weighted average exercise price per share of $41.38.

Employee Stock Purchase Plan

The price at which common stock is purchased under the Amended ESPP is equal to 85% of the fair market value of the common stock on the first or last day of the offering period, whichever is lower. As of June 30, 2018, 65,007 shares were available for future purchases under the Amended ESPP.

6. Litigation

The Company records an estimate of a loss when the loss is considered probable and estimable. Where a liability is probable and there is a range of estimated loss and no amount in the range is more likely than any other number in the range, the Company records the minimum estimated liability related to the claim in accordance with *FASB ASC Topic 450 Contingencies.* As additional information becomes available, the Company assesses the potential liability related to its pending litigation and revises its estimates. Revisions in the Company's estimates of potential liability could materially impact its results of operations.

On July 27, 2018, AG Oncon, LLC, AG Ofcon, Ltd., Calamos Market Neutral Income Fund, Capital Ventures International, Citadel Equity Fund Ltd., Opti Opportunity Master Fund, Polygon Convertible Opportunity Master Fund, Wolverine Flagship

Fund Trading Limited, as plaintiffs, filed a complaint in the Court of Chancery of the State of Delaware (AG Oncon, LLC v. Ligand Pharmaceuticals Inc.) alleging claims for violation of the Trust Indenture Act, breach of contract, damages and a declaratory judgment that the Supplemental Indenture, dated as of February 20, 2018, entered into by us and Wilmington Trust, National Association, as trustee, is invalid. The Supplemental Indenture supplemented the Indenture, dated as of August 18, 2014, between us and Wilmington Trust, National Association, which governs the 2019 Notes (as further supplemented, the "Indenture"). The Supplemental Indenture corrected a scrivener's error in the conversion calculation of the 2019 Notes and was entered into pursuant to Section 9.01(b) of the Indenture, which expressly permits amendments to the Indenture without consent of the noteholders to conform the terms of the Indenture or the 2019 Notes to the "Description of the Notes" section of the offering memorandum for the 2019 Notes, which contained the correct conversion calculation. In addition, the correction conforms the calculation to the stated number of shares to be received upon conversion of the 2019 Notes that is stated in Section 10.01(a) of the Indenture, or a conversion rate initially equal to 13.3251 shares of common stock per $1,000 in principal amount of 2019 Notes. Notice of the Supplemental Indenture was provided to the holders of the 2019 Notes on March 8, 2018 in accordance with Section 9.04 of the Indenture. We believe the allegations are completely without merit, reject all claims raised by the plaintiffs and intend to vigorously defend this matter.

In November 2017, CyDex, our wholly owned subsidiary, received a paragraph IV certification from Teva Pharmaceuticals USA, Inc., Teva Pharmaceutical Industries Ltd. and Actavis, LLC (collectively "Teva") alleging that certain of our patents related to Captisol were invalid, unenforceable and/or will not be infringed by Teva's ANDA related to Spectrum Pharmaceuticals' NDA for Evomela. On December 20, 2017, CyDex filed a complaint against Teva in the U.S. District Court for the District of Delaware, asserting that Teva's ANDA would infringe our patents. On March 22, Teva filed an answer and counterclaims seeking declarations of non-infringement and invalidity as to each of the asserted patents and on April 12, CyDex filed an answer to Teva's counterclaims.

ITEM 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Caution: This discussion and analysis may contain predictions, estimates and other forward-looking statements that involve a number of risks and uncertainties, including those discussed in Part II, Item 1A:"Risk Factors." This outlook represents our current judgment on the future direction of our business. These statements include those related to our Captisol-related revenues, our Promacta, Kyprolis, and other product royalty revenues, product returns, and product development. Actual events or results may differ materially from our expectations. For example, there can be no assurance that our revenues or expenses will meet any expectations or follow any trend(s), that we will be able to retain our key employees or that we will be able to enter into any strategic partnerships or other transactions. We cannot assure you that we will receive expected Promacta, Kyprolis, Captisol and other product revenues to support our ongoing business or that our internal or partnered pipeline products will progress in their development, gain marketing approval or achieve success in the market. In addition, ongoing or future arbitration, or litigation or disputes with third parties may have a material adverse effect on us. Such risks and uncertainties, and others, could cause actual results to differ materially from any future performance suggested. We undertake no obligation to make any revisions to these forward-looking statements to reflect events or circumstances arising after the date of this quarterly report. This caution is made under the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act.

Our trademarks, trade names and service marks referenced herein include Ligand. Each other trademark, trade name or service mark appearing in this quarterly report belongs to its owner.

References to "Ligand Pharmaceuticals Incorporated," "Ligand," the "Company," "we" or "our" include Ligand Pharmaceuticals Incorporated and our wholly owned subsidiaries.

Overview

We are a biopharmaceutical company focused on developing and acquiring technologies that help pharmaceutical companies discover and develop medicines. Over our more than 30 year history, we have employed research technologies such as nuclear receptor assays, high throughput computer screening, formulation science, liver targeted pro-drug technologies and antibody discovery technologies to assist companies in their work toward securing prescription drug approvals. We currently have partnerships and license agreements with over 95 pharmaceutical and biotechnology companies, and over 165 different programs under license with us are currently in various stages of commercialization and development. We have contributed novel research and technologies for approved medicines that treat cancer, osteoporosis, fungal infections and low blood platelets, among others. Our partners have programs currently in clinical development targeting seizure, coma, cancer, diabetes, cardiovascular disease, muscle wasting, liver disease, and kidney disease, among others.

We have over 800 issued patents worldwide. We have assembled our large portfolio of fully-funded programs either by licensing our own proprietary drug development programs, licensing our platform technologies such as Captisol or OmniAb to partners for use with their proprietary programs, or acquiring existing partnered programs from other companies. Fully-funded programs are those for which our partners pay all of the development and commercialization costs. For our internal programs, we generally plan to advance drug candidates through early-stage drug development or clinical proof-of-concept.

Our business model creates value for stockholders by providing a diversified portfolio of biotech and pharmaceutical product revenue streams that are supported by an efficient and low corporate cost structure. Our goal is to offer investors an opportunity to participate in the promise of the biotech industry in a profitable, diversified and lower-risk business than a typical biotech company. Our business model is based on doing what we do best: drug discovery, early-stage drug development, product reformulation and partnering. We partner with other pharmaceutical companies to leverage what they do best (late-stage development, regulatory management and commercialization) to ultimately generate our revenue. We believe that focusing on discovery and early-stage drug development while benefiting from our partners' development and commercialization expertise will reduce our internal expenses and allow us to have a larger number of drug candidates progress to later stages of drug development.

Our revenue consists of three primary elements: royalties from commercialized products, license and milestone payments and sale of Captisol material. In addition to discovering and developing our own proprietary drugs, we selectively pursue acquisitions to bring in new assets, pipelines, and technologies to aid in generating additional potential new revenue streams.

Portfolio Program Updates

Promacta®/Revolade®

- Novartis reported second quarter 2018 net sales of Promacta/Revolade (eltrombopag) of $292 million, an $82 million or 39% increase over the same period in 2017.
- Novartis announced that the FDA has accepted the company's supplemental New Drug Application (sNDA) and granted Priority Review designation to Promacta in combination with standard immunosuppressive therapy for first-line treatment of severe aplastic anemia.
- Novartis published the results of a survey uncovering the real-world impact of immune thrombocytopenia on patient quality of life.

Kyprolis® (carfilzomib), an Amgen Product Utilizing Captisol

- On July 26, 2018, Amgen reported second quarter net sales of Kyprolis of $263 million, a $52 million or 25% increase over the same period in 2017. On August 1, 2018, Ono Pharmaceutical Company reported Kyprolis sales in Japan of approximately $11.6 million for the most recent quarter.
- On June 11, 2018, Amgen announced that the FDA approved the sNDA to add the positive overall survival (OS) data from the Phase 3 ASPIRE trial to the U.S. Prescribing Information for Kyprolis.
- On April 30, 2018, Amgen announced that the CHMP adopted a positive opinion recommending a label variation for Kyprolis in the European Union to include the final OS data from the Phase 3 ASPIRE trial.

- On June 1, 2018, Amgen announced results from the Phase 3 A.R.R.O.W. trial of a once-weekly Kyprolis dosing regimen in patients with relapsed and refractory multiple myeloma. Patients in the trial treated with once-weekly Kyprolis achieved a statistically significant 3.6 month improvement in progression-free survival (PFS) compared with the twice-weekly regimen (median PFS 11.2 months for once-weekly Kyprolis versus 7.6 months for twice-weekly Kyprolis; HR=0.69; 95% CI: 0.54-0.88; one-sided p=0.0014). The overall response rate in patients treated with once-weekly Kyprolis was 62.9% versus 40.8% for those treated with the twice-weekly regimen (p<0.0001).

Additional Pipeline and Partner Developments

- Sage Therapeutics announced that the FDA accepted the filing of a New Drug Application (NDA) for IV-brexanolone for the treatment of postpartum depression, and that the NDA was granted Priority Review status and a Prescription Drug User Fee Act (PDUFA) target date of December 19, 2018.
- Retrophin announced first patient enrollment in the Phase 3 DUPLEX Study evaluating the long-term nephroprotective potential of sparsentan for the treatment of focal segmental glomerulosclerosis. Topline data from the 36-week interim efficacy endpoint are expected in the second half of 2020.
- Retrophin announced that the United States Patent and Trademark Office issued a new patent providing coverage for the use of sparsentan in the treatment of IgAN and broadening the existing coverage to include all doses of sparsentan between 200 and 800 mg/day. The patent has a stated expiration date of March 30, 2030.
- CASI Pharmaceuticals announced that preparations for the EVOMELA commercial launch in China were underway, and that CASI expects formal regulatory application feedback from China's State Drug Administration.
- Viking Therapeutics announced that enrollment had been completed in the company's Phase 2 trial of VK2809 in patients with primary hypercholesterolemia and non-alcoholic fatty liver disease, and that trial results are expected in the second half of 2018.
- Viking Therapeutics also announced that the results from the company's Phase 2 study of VK5211 in patients recovering from hip fracture have been selected for presentation at the American Society for Bone and Mineral Research 2018 annual meeting.
- Melinta Therapeutics announced oral presentations and posters for Baxdela at the American Society for Microbiology's annual ASM Microbe 2018 meeting.
- Opthea Limited announced that its Phase 1b trial of OPT-302 in Diabetic Macular Edema (DME) met its primary objective and that the company had dosed the first patient in a Phase 2a randomized, controlled clinical trial evaluating OPT-302 in patients with persistent center-involved DME.
- Opthea Limited announced it reached the mid-way point of patient recruitment for its Phase 2b clinical trial of OPT-302 in wet age-related macular degeneration and plans to report primary data from the study in early 2020.
- Merrimack Pharmaceuticals announced a poster presentation related to seribantumab at the 2018 American Society of Clinical Oncology (ASCO) Annual Meeting.
- Seelos Therapeutics announced a merger agreement with Apricus Biosciences, to form a combined publicly-traded company focused on developing a portfolio that includes Ligand-partnered CNS programs.
- Aldeyra Therapeutics announced enrollment of the first patient in a Phase 3 clinical trial of topical ocular reproxalap for the treatment of allergic conjunctivitis.
- Aldeyra Therapeutics also announced that the last patient has been dosed in a Phase 2b clinical trial of topical ocular reproxalap in dry eye disease.
- Syros Pharmaceuticals announced new preclinical data showing that Captisol-enabled SY-1365, a first-in-class selective cyclin-dependent kinase 7 inhibitor currently in a Phase 1 trial in patients with advanced solid tumors, demonstrated potent anti-tumor activity in multiple models of heavily pretreated ovarian cancer.
- Aptevo Therapeutics announced that it had submitted an Investigational New Drug (IND) application to the FDA to evaluate APVO436 in a Phase 1 clinical study for the treatment of patients with relapsed or refractory acute myeloid leukemia or myelodysplastic syndrome.
- Aptevo Therapeutics presented new data for APVO436 at the American Association for Cancer Research (AACR) 2018 Annual Meeting.
- Arcus Biosciences announced that the FDA cleared the IND application for OmniAb-derived AB122 and the company presented a poster on AB122 at the AACR 2018 Annual Meeting.
- Arcus Biosciences also announced a collaboration agreement with Infinity Pharmaceuticals to evaluate AB122 with IPI-549, an immuno-oncology candidate that selectively inhibits PI3K-gamma.
- CStone Pharmaceuticals announced two pivotal Phase 2 studies exploring the efficacy and safety of OmniAb-derived CS1001 in patients with natural killer cell/T-cell lymphoma and classical Hodgkin's lymphoma have been initiated and have each enrolled and dosed the first patient.
- CStone Pharmaceuticals announced a collaboration agreement with Blueprint Medicines to initiate a proof-of-concept clinical trial in China evaluating BLU-554 in combination with OmniAb-derived CS1001.

- CStone Pharmaceuticals also announced the completion of a $260 million series B financing that will primarily fund clinical development of OmniAb-derived CS1001.
- MEI Pharma announced a poster presentation related to ME-344 at the 2018 ASCO Annual Meeting.
- Roivant announced that OmniAb-derived RVT-1401 (previously HL161) will form the foundation of a new company called Immunovant.
- Nucorion Pharmaceuticals presented preclinical data for its novel liver-targeting prodrug technology program, NCO-1010, for the treatment of hepatitis B at the European Association for the Study of the Liver's International Liver Congress.

Business Development

- Ligand announced receipt of a $47 million payment as a result of signing an amendment related to its OmniAb platform license agreement with WuXi Biologics. Under the amended agreement, Ligand will continue to be eligible to earn royalties at the same rate and terms as the previous agreement and the predefined contract payments have been eliminated. With this new business relationship, WuXi Biologics believes it will be able to increase the number of OmniAb antibodies it discovers for its clients in China and around the world.
- Ligand entered into a research and development agreement with Janssen Pharmaceuticals for the development by Ligand of a heavy-chain-only (HCO) version of OmniChicken, for which Ligand is eligible to earn defined milestone payments. Upon completion of the project, Ligand will be able to make the HCO OmniChicken available to other commercial partners.
- Ligand entered into OmniChicken license expansions with FivePrime and Amgen, allowing the companies to use the OmniChicken technology.
- Ligand entered into a Captisol use agreement with Sunshine Lake Pharmaceuticals.

Internal Research and Development

- Ligand presented a poster at the National Lipid Association's 2018 Scientific Sessions showing that Ligand's LTP Technology significantly improves liver targeting of the statin rosuvastatin (Crestor®), and may potentially be an effective strategy to increase the therapeutic index of statins and reduce statin intolerance.
- A paper by Ligand scientists entitled "V(D)J Rearrangement is Dispensable for Producing CDR-H3 Sequence Diversity in a Gene Converting Species" was published in the journal *Frontiers in Immunology*, highlighting the use of OmniChicken in antibody drug discovery.

Recent Financing

Ligand announced the pricing of $750 million aggregate principal amount (including overallotments) of 0.75% convertible senior notes due 2023 with an initial conversion price of $248.48 per share. Ligand also repurchased 260,000 shares in the transaction and entered into convertible note hedge transactions with the net effect of increasing the effective conversion price of the notes to $315.38 per share. Ligand indicated the net proceeds of the offering will be used for acquisitions, working capital and other general corporate purposes.

Results of Operations

Revenue

(Dollars in thousands)	Q2 2018	Q2 2017	Change	% Change	YTD 2018	YTD 2017	Change	% Change
Royalties	**$ 31,396**	$ 14,211	$ 17,185	121%	**$ 52,216**	$ 38,441	$ 13,775	36%
Material sales	**7,612**	5,550	2,062	37%	**12,003**	6,672	5,331	80%
License fees, milestones and other revenue	**51,035**	8,234	42,801	520%	**81,981**	12,151	69,830	575%
Total revenue	**$ 90,043**	$ 27,995	$ 62,048	222%	**$ 146,200**	$ 57,264	$ 88,936	155%

We adopted ASC 606, the new revenue standard, in the first quarter of 2018 and now recognize royalties on sales of products commercialized by our partners in the quarter the product is sold as opposed to on a one-quarter lag as previously recognized under ASC 605. The results for the reporting periods beginning after January 1, 2018, are presented in accordance with the new standard, although comparative information has not been restated and continues to be reported under the accounting standards and policies in effect for those periods. The adoption of this new standard resulted in higher reported

revenue in the second quarter of 2018 of $10.4 million and lower reported revenue in the first half of 2018 of $1.5 million, compared to what it would have been under ASC 605.

Royalty revenue is a function of our partners' product sales and the applicable royalty rate. Promacta and Kyprolis royalty rates are under a tiered royalty rate structure with the highest tier being 9.4% and 3.0%, respectively. Evomela has a fixed royalty rate of 20%.

The following table represents royalty revenue by program under the new (ASC 606) and prior (ASC 605) revenue standard:

(in millions)	Q2 2018 Estimated Partner Product Sales	Effective Royalty Rate	Q2 2018 Royalty Revenue under ASC 606	Q1 2018 Partner Product Sales	Effective Royalty Rate	Q2 2018 Royalty Revenue under ASC 605	Q1 2017 Partner Products Sales	Effective Royalty Rate	Q2 2017 Royalty Revenue under ASC 605
Promacta	**$ 292.0**	**8.49 %**	**$ 24.8**	$ 257.1	6.07 %	$ 15.6	$ 175.8	5.52 %	$ 9.7
Kyprolis	**275.0**	**1.78 %**	**4.9**	234.1	1.45 %	3.4	195.8	1.48 %	2.9
Evomela	**5.8**	**20.00 %**	**1.2**	8.1	20.00 %	1.6	6.3	20.00 %	1.3
Other	**43.4**	**1.15 %**	**0.5**	44.0	0.91 %	0.4	38.8	0.77 %	0.3
Total	**$ 616.2**		**$ 31.4**	$ 543.3		$ 21.0	$ 416.7		$ 14.2

Q2 2018 vs. Q2 2017

Total revenue increased $62.0 million, or 222%, to $90.0 million in Q2 2018 compared to $28.0 million in Q2 2017 primarily driven by a $47.0 million OmniAB platform license fee received from WuXi. An increase in sales of Promacta and Kyprolis were key drivers in the increase in royalty revenue. Material sales increased compared to the prior year quarter due primarily to timing of customer purchases of Captisol for use in clinical trials and in commercialized products.

YTD 2018 vs. YTD 2017

Total revenue increased $88.9 million, or 155%, to $146.2 million in the first half of 2018 compared to $57.3 million in the first half of 2017 primarily driven by a $47.0 million OmniAB platform license fee received from WuXi and $20.0 million received from Roivant upon entering into the GRA license agreement to develop and commercialize LGD-6972. An increase in sales of Promacta and Kyprolis were key drivers in the increase in royalty revenue. Material sales also contributed to the increase and was due primarily to timing of customer purchases of Captisol for use in clinical trials and in commercialized products.

Operating Costs and Expenses

(Dollars in thousands)	Q2 2018	% of Revenue	Q2 2017	% of Revenue	YTD 2018	% of Revenue	YTD 2017	% of Revenue
Costs of sales	**$ 1,134**		$ 903		**$ 1,922**		$ 1,244	
Amortization of intangibles	**3,305**		2,706		**6,584**		5,420	
Research and development	**6,135**		4,822		**13,540**		13,495	
General and administrative	**9,294**		6,549		**16,938**		13,872	
Total operating costs and expenses	**$ 19,868**	22%	$ 14,980	54%	**$ 38,984**	27%	$ 34,031	59%

Q2 2018 vs. Q2 2017

Total operating costs and expenses as a percentage of total revenue decreased in Q2 2018 compared to Q2 2017. Total revenue for Q2 2018 increased $62.0 million or 155% while total operating costs and expenses for that quarter increased $4.9 million. Amortization of intangibles increased primarily as a result of the Crystal acquisition in the fourth quarter of 2017. Research and development expenses increased due to timing of internal development costs. General and administrative expenses increased primarily due to a $1.2 million payment to a third-party in-licensor and an increase in headcount related expenses.

YTD 2018 vs/. YTD 2017

Total operating costs and expenses as a percentage of total revenue decreased in the first half of 2018 compared to the first half of 2017. Total revenue for the first half of 2018 increased $88.9 million or 155% while total operating costs and expenses for that period increased $5.0 million . Amortization of intangibles increased primarily as a result of the Crystal acquisition in the fourth quarter of 2017. General and administrative expenses increased primarily due to a $1.2 million payment to a third-party in-licensor and an increase in headcount related expenses including stock-based compensation.

Other Income (Expense)

(Dollars in thousands)	Q2 2018	Q2 2017	Change	YTD 2018	YTD 2017	Change
Gain (loss) from Viking	**$ 39,963**	$ (1,400)	$ 41,363	**$ 61,808**	$ (2,406)	$ 64,214
Interest income	**2,762**	481	2,281	**3,637**	835	2,802
Interest expense	**(13,454)**	(3,341)	(10,113)	**(16,933)**	(6,638)	(10,295)
Other expense, net	**(3,867)**	(455)	(3,412)	**(4,835)**	(531)	(4,304)
Total other expense, net	**$ 25,404**	$ (4,715)	$ 30,119	**$ 43,677**	$ (8,740)	$ 52,417

In the first quarter of 2018 we discontinued accounting for our ownership interest in Viking common stock under the equity method and now account for Viking as an equity security with changes in the fair value of Viking common stock recorded as unrealized gain (loss) from Viking. The increase in gain (loss) from Viking is a result of a $32.3 million and $53.5 million unrealized gain recorded in the second quarter and first half of 2018, respectively. In addition, gain (loss) from Viking includes an unrealized gain relating to an increase in the market value of Viking warrants held by us of $7.7 million and $8.5 million in the second quarter and first half of 2018, respectively.

Interest income, net consists primarily of short term investment transactions and the change in their fair market value. The increase over the prior periods presented is due to the increase in our short term investment balance as a result of the 2023 Notes financing on May 22, 2018.

Interest expense includes the 0.75% coupon cash interest expense in addition to the non-cash accretion of discount on our 2019 Notes and 2023 Notes. The increase from prior period is primarily due to the issuance of the 2023 Notes in May of 2018 and settlement of a portion of our 2019 Notes in the second quarter of 2018. *See Note 3 - Convertible Senior Notes.*

The increase in Other expense, net in Q2 2018 is due primarily to the increase in the fair value of contingent liabilities associated with our Metabasis acquisition and a net increase in our derivative instrument expense associated with our convertible notes and hedge transactions. *See Note 3 - Convertible Senior Notes.*

Income Tax Expense

(Dollars in thousands)	Q2 2018	Q2 2017	Change	YTD 2018	YTD 2017	Change
Income before income taxes	**$ 95,579**	$ 8,300	$ 87,279	**$ 150,893**	$ 14,493	$ 136,400
Income tax expense	**(22,419)**	(2,242)	(20,177)	**(32,452)**	(3,356)	(29,096)
Income from operations	**$ 73,160**	$ 6,058	$ 67,102	**$ 118,441**	$ 11,137	$ 107,304
Effective tax rate	23.5%	27.0%		21.5%	23.2%	

We compute our income tax provision by applying the estimated annual effective tax rate to income or loss from recurring operations and adding the effects of any discrete income tax items specific to the period. Our effective tax rate for the second quarter and first half of 2018 was approximately 23% and 22% and did not differ significantly from the combined federal and state statutory rate of 22.5%. Our effective tax rate for the comparable prior year periods was approximately 27%

and 23%. Excluding discrete tax items primarily related to share-based compensation tax benefits, our effective tax rate for the prior year periods was 37% and did not differ significantly from the federal statutory rate of 35%.

Liquidity and Capital Resources

We have financed our operations through offerings of our equity securities, issuance of convertible notes, product sales and the subsequent sales of our commercial assets, royalties, collaborative research and development and other revenue, and operating lease transactions.

We had net income of $73.2 million for the quarter ended June 30, 2018. As of June 30, 2018, our cash, cash equivalents and marketable securities (including our investment in Viking) totaled $1.0 billion, and we had working capital of $847.6 million. We believe that our currently available funds, cash generated from operations as well as existing sources of and access to financing will be sufficient to fund our anticipated operating, capital requirements and debt service requirement.

While we believe in the viability of our strategy to generate sufficient operating cash flow and in our ability to raise additional funds, there can be no assurances to that effect.

Investments

We invest our excess cash principally in U.S. government debt securities, municipal debt securities, investment-grade corporate debt securities and certificates of deposit. We have established guidelines relative to diversification and maturities that maintain safety and liquidity. These guidelines are periodically reviewed and modified to take advantage of trends in yields and interest rates. Additionally, we own certain equity securities as a result of milestones and license fees received from licensees as well as warrants to purchase Viking common stock.

Borrowings and Other Liabilities

2019 Convertible Senior Notes

We have convertible debt outstanding as of June 30, 2018 related to our 2019 Convertible Senior Notes. In August 2014, we issued $245.0 million aggregate principal amount of convertible senior unsecured notes. The 2019 Convertible Senior Notes are convertible into common stock upon satisfaction of certain conditions. Interest of 0.75% per year is payable semi-annually on August 15th and February 15th through the maturity of the notes in August 2019.

In May and June 2018, we settled notices for conversion of $21.8 million in principal of 2019 Notes. In July 2018, we received notices for conversion of $49.9 million in principal of 2019 Notes.

2023 Convertible Senior Notes

We have convertible debt outstanding as June 30, 2018 related to our 2023 Notes. In May 2018, we issued $750.0 million aggregate principal amount of convertible senior unsecured notes. The 2023 Notes are convertible into common stock upon satisfaction of certain conditions. Interest of 0.75% per year is payable semi-annually on May 15th and November 15th through maturity of the notes in May 2023.

We may, from time to time, subject to market conditions, repurchase the 2019 Notes and/or 2023 Notes or exchange such notes in voluntary transactions with the holders of such notes.

Repurchases of Common Stock

In September 2015, our Board of Directors authorized us to repurchase up to $200.0 million of our common stock from time to time over a period of up to three years. We repurchased 6,000 shares of common stock during Q2 2018 under the authorized program. As of June 30, 2018, $190.6 million remains available for repurchase under the authorized program. Additionally, on May 18, 2018 in conjunction with our 2023 Convertible Senior Notes debt offering we repurchased 260,000 shares at a cost of $191.14 per share.

Contingent Liabilities

Metabasis

In connection with the acquisition of Metabasis in January 2010, we entered into four CVR agreements with Metabasis shareholders. The CVRs entitle the holders to cash payments upon the sale or licensing of certain assets and upon the achievement of specified milestones. See *footnote 2,* Fair Value Measurements.

Leases and Off-Balance Sheet Arrangements

We lease our office facilities under operating lease arrangements with varying terms through April 2023. The agreements provide for increases in annual rents based on changes in the Consumer Price Index or fixed percentage increases of 3.0%. We had no off-balance sheet arrangements at June 30, 2018 and December 31, 2017.

Cash Flows

(Dollars in thousands)	YTD 2018	YTD 2017 Revised
Net cash provided by (used in):		
Operating activities	$ 134,405	$ 29,610
Investing activities	(620,319)	13,533
Financing activities	616,753	(1,672)
Net increase in cash and cash equivalents	$ 130,839	$ 41,471

During the first half of 2018, we generated cash from operations, from the 2023 Notes offering and from issuance of common stock under employee stock plans. During the same period we used cash for investing activities, including payments to CVR holders and net purchases of short term investments. We used $52.7 million to repurchase our common stock in the first half of 2018.

During the first half of 2017, we generated cash from operations, from issuance of common stock under employee stock plans and from net proceeds from the sale and maturity of short term investments. During the same period we used cash for investing activities, including payments to CVR holders. We also used cash to pay taxes related to net share settlement of equity awards.

Critical Accounting Policies

Certain of our policies require the application of management judgment in making estimates and assumptions that affect the amounts reported in our consolidated financial statements and the disclosures made in the accompanying notes. Those estimates and assumptions are based on historical experience and various other factors deemed applicable and reasonable under the circumstances. The use of judgment in determining such estimates and assumptions is by nature, subject to a degree of uncertainty. Accordingly, actual results could differ materially from the estimates made.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk from interest rates and equity prices which could affect our results of operations, financial condition and cash flows. We manage our exposure to these market risks through our regular operating and financing activities.

Investment Portfolio Risk

At June 30, 2018, our investment portfolio included investments in available-for-sale securities of $805.5 million. These securities are subject to market risk and may decline in value based on market conditions. Due to the short-term duration of our investment portfolio and low risk profile of our investments, a 10% increase in interest rates would not have material effect on the fair value of our portfolio.

Equity Price Risk

Our 2019 Notes and 2023 Notes include conversion and settlement provisions that are based on the price of our common stock at conversion or maturity of the notes, as applicable. The minimum amount of cash we may be required to pay is $223.2 million for settlement of the 2019 Notes and $750.0 million for the settlement of the 2023 Notes, but will ultimately be determined by the price of our common stock. The fair values of our 2019 Notes and 2023 Notes are dependent on the price and volatility of our common stock and will generally increase or decrease as the market price of our common stock changes. In order to minimize the impact of potential dilution to our common stock upon the conversion of the 2019 Notes or 2023 Notes, we entered into convertible bond hedge transactions covering the shares of our common stock issuable upon conversion or maturity relating of the 2019 Notes or 2023 Notes. Concurrently with entering into the convertible bond hedge transactions, we entered into warrant transactions whereby we sold warrants with an exercise price of approximately $125.08 per share associated with the 2019 Notes and $315.38 per share associated with the 2023 Notes, subject to adjustment. Throughout the term of 2023 Notes, the notes may have a dilutive effect on our earnings per share to the extent the stock price exceeds the conversion price of the notes. On May 22, 2018 we entered into a supplemental indenture related to the 2019 Notes, whereby we relinquished our right to settle the conversion premium in shares, as a result the 2019 Notes will not have a dilutive effect on our earnings per share as it relates to conversion notices received subsequent to May 22, 2018. Additionally, the warrants may have a dilutive effect on our earnings per share to the extent the stock price exceeds the strike price of the warrants.

Foreign currency risk

Through our licensing and business operations, we are exposed to foreign currency risk. Foreign currency exposures arise from transactions denominated in a currency other than the functional currency and from foreign denominated revenues and profit translated into U.S. dollars. Our collaborative partners sell our products worldwide in currencies other than the U.S. dollar. Because of this, our revenues from royalty payments are subject to risk from changes in exchange rates.

We purchase Captisol from Hovione, located in Lisbon, Portugal. Payments to Hovione are denominated and paid in U.S. dollars, however the unit price of Captisol contains an adjustment factor which is based on the sharing of foreign currency risk between the two parties. The effect of an immediate 10% change in foreign exchange rates would not have a material impact on our financial condition, results of operations or cash flows. We do not currently hedge our exposures to foreign currency fluctuations.

Interest rate risk

We are exposed to market risk involving rising interest rates. To the extent interest rates rise, our interest costs could increase. An increase in interest costs of 10% would not have a material impact on our financial condition, results of operations or cash flows.

ITEM 4. CONTROLS AND PROCEDURES

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures, as such term is defined in Rules 13a15(e) and 15d-15(e) under the Exchange Act. Based upon and as of the date of that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that our disclosure controls and procedures were effective to provide reasonable assurance that information required to be disclosed by us in reports we file or submit pursuant to the Exchange Act is (1) recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and (2) accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Our disclosure controls were designed to provide reasonable assurance that the controls and procedures would meet their objectives. Our management, including the Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls will prevent all error and all fraud. A control system, no matter how well designed and operated, can provide only reasonable assurance of achieving the designed control objectives and management is required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the Company have been detected. These inherent limitations include the realities that judgments in decision making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusions of two or more people, or by management override of the control. Because of the inherent limitations in a cost-effective, maturing control system, misstatements due to error or fraud may occur and not be detected.

There have not been any changes in our internal control over financial reporting (as defined in Rule 13a-15(f) and 15d-15(f) under the Exchange Act) during the quarter of the fiscal year to which this report relates that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. Legal Proceedings

From time to time we are subject to various lawsuits and claims with respect to matters arising out of the normal course of our business. Due to the uncertainty of the ultimate outcome of these matters, the impact on future financial results is not subject to reasonable estimates.

On July 27, 2018, AG Oncon, LLC, AG Ofcon, Ltd., Calamos Market Neutral Income Fund, Capital Ventures International, Citadel Equity Fund Ltd., Opti Opportunity Master Fund, Polygon Convertible Opportunity Master Fund, Wolverine Flagship Fund Trading Limited, as plaintiffs, filed a complaint in the Court of Chancery of the State of Delaware (AG Oncon, LLC v. Ligand Pharmaceuticals Inc.) alleging claims for violation of the Trust Indenture Act, breach of contract, damages and a declaratory judgment that the Supplemental Indenture, dated as of February 20, 2018, entered into by us and Wilmington Trust, National Association, as trustee, is invalid. The Supplemental Indenture supplemented the Indenture, dated as of August 18, 2014, between us and Wilmington Trust, National Association, which governs the 2019 Notes (as further supplemented, the "Indenture"). The Supplemental Indenture corrected a scrivener's error in the conversion calculation of the 2019 Notes and was entered into pursuant to Section 9.01(b) of the Indenture, which expressly permits amendments to the Indenture without consent of the noteholders to conform the terms of the Indenture or the 2019 Notes to the "Description of the Notes" section of the offering memorandum for the 2019 Notes, which contained the correct conversion calculation. In addition, the correction conforms the calculation to the stated number of shares to be received upon conversion of the 2019 Notes that is stated in Section 10.01(a) of the Indenture, or a conversion rate initially equal to 13.3251 shares of common stock per $1,000 in principal amount of 2019 Notes. Notice of the Supplemental Indenture was provided to the holders of the 2019 Notes on March 8, 2018 in accordance with Section 9.04 of the Indenture. We believe the allegations are completely without merit, reject all claims raised by the plaintiffs and intend to vigorously defend this matter.

In November 2017, CyDex, our wholly owned subsidiary, received a paragraph IV certification from Teva Pharmaceuticals USA, Inc., Teva Pharmaceutical Industries Ltd. and Actavis, LLC (collectively "Teva") alleging that certain of our patents related to Captisol were invalid, unenforceable and/or will not be infringed by Teva's ANDA related to Spectrum Pharmaceuticals' NDA for Evomela. On December 20, 2017, CyDex filed a complaint against Teva in the U.S. District Court for the District of Delaware, asserting that Teva's ANDA would infringe our patents. On March 22, 2018 Teva filed an answer and counterclaims seeking declarations of non-infringement and invalidity as to each of the asserted patents and on April 12, 2018 CyDex filed an answer to Teva's counterclaims.

ITEM 1A. RISK FACTORS

The following is a summary description of some of the many risks we face in our business. You should carefully review these risks in evaluating our business, including the businesses of our subsidiaries. You should also consider the other information described in this report. The risk factors set forth below with an asterisk (*) next to the title are new risk factors or risk factors containing material changes from the risk factors previously disclosed in Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2017, as filed with the SEC on March 1, 2018:

Future revenue based on Promacta, Kyprolis and Evomela, as well as sales of our other products, may be lower than expected.

Novartis is obligated to pay us royalties on its sales of Promacta, and we receive revenue from Amgen based on both sales of Kyprolis and purchases of Captisol material for clinical and commercial uses. These payments are expected to be a substantial portion of our ongoing revenues for some time. In addition, we receive revenues based on sales of Evomela and other products. Any setback that may occur with respect to any of our partners' products, and in particular Promacta or Kyprolis, could significantly impair our operating results and/or reduce our revenue and the market price of our stock. Setbacks for the products could include problems with shipping, distribution, manufacturing, product safety, marketing, government regulation or reimbursement, licenses and approvals, intellectual property rights, competition with existing or new products and physician or patient acceptance of the products, as well as higher than expected total rebates, returns, discounts, or unfavorable exchange rates. These products also are or may become subject to generic competition.

Future revenue from sales of Captisol material to our license partners may be lower than expected.

Revenues from sales of Captisol material to our collaborative partners represent a significant portion of our current revenues. Any setback that may occur with respect to Captisol could significantly impair our operating results and/or reduce the market price of our stock. Setbacks for Captisol could include problems with shipping, distribution, manufacturing, product safety, marketing, government regulation or reimbursement, licenses and approvals, intellectual property rights, competition with existing or new products and physician or patient acceptance of the products using Captisol.

If products or product candidates incorporating Captisol material were to cause any unexpected adverse events, the perception of Captisol safety could be seriously harmed. If this were to occur, we may not be able to sell Captisol unless and until we are able to demonstrate that the adverse event was unrelated to Captisol, which we may not be able to do. Further, the FDA could require us to submit additional information for regulatory review or approval, including data from extensive safety testing or clinical testing of products using Captisol. This would be expensive and it may delay the marketing of Captisol-enabled products and receipt of revenue related to those products, which could significantly impair our operating results and/or reduce the market price of our stock.

We obtain Captisol from a sole source supplier, and if this supplier were to cease to be able, for any reason, to supply Captisol to us in the amounts we require, or decline to supply Captisol to us, we would be required to seek an alternative source, which could potentially take a considerable length of time and impact our revenue and customer relationships. We maintain inventory of Captisol, which has a five year shelf life, at three geographically dispersed storage locations in the United States and Europe. If we were to encounter problems maintaining our inventory, such as natural disasters, at one or more of these locations, it could lead to supply interruptions. While we believe we maintain adequate inventory of Captisol to meet our current and expected future partner needs, our estimates and projections for Captisol demand may be wrong and any supply interruptions could materially adversely impact our operating results.

We currently depend on our arrangements with our partners and licensees to sell products using our Captisol technology. These agreements generally provide that our partners may terminate the agreements at will. If our partners discontinue sales of products using Captisol, fail to obtain regulatory approval for products using Captisol, fail to satisfy their obligations under their agreements with us, or choose to utilize a generic form of Captisol should it become available, or if we are unable to establish new licensing and marketing relationships, our financial results and growth prospects would be materially affected. Furthermore, we maintain significant accounts receivable balances with certain customers purchasing Captisol materials, which may result in the concentration of credit risk. We generally do not require any collateral from our customers to secure payment of these accounts receivable. If any of our major customers were to default in the payment of their obligations to us, our business, operating results and cash flows could be adversely affected.

Further, under most of our Captisol outlicenses, the amount of royalties we receive will be reduced or will cease when the relevant patent expires. Our low-chloride patents and foreign equivalents are not expected to expire until 2033, our high purity patents and foreign equivalents, are not expected to expire until 2029 and our morphology patents and foreign equivalents, are not expected to expire until 2025, but the initially filed patents relating to Captisol expired starting in 2010 in the United States and in 2016 in most countries outside the United States. If our other intellectual property rights are not sufficient to prevent a generic form of Captisol from coming to market and if in such case our partners choose to terminate their agreements with us, our Captisol revenue may decrease significantly.

Third party intellectual property may prevent us or our partners from developing our potential products; our and our partners' intellectual property may not prevent competition; and any intellectual property issues may be expensive and time consuming to resolve.

The manufacture, use or sale of our potential products or our licensees' products or potential products may infringe the patent rights of others. If others obtain patents with conflicting claims, we may be required to obtain licenses to those patents or to develop or obtain alternative technology. We may not be able to obtain any such licenses on acceptable terms, or at all. Any failure to obtain such licenses could delay or prevent us from pursuing the development or commercialization of our potential products.

Generally, our success will depend on our ability and the ability of our partners to obtain and maintain patents and other intellectual property rights for our and their potential products. Our patent position is uncertain and involves complex legal and technical questions for which legal principles are unresolved. Even if we or our partners do obtain patents, such patents may not adequately protect the technology we own or have licensed.

We permit our partners to list our patents that cover their branded products in the Orange Book. If a third party files an NDA or ANDA for a generic drug product that relies in whole or in part on studies contained in our partner's NDA for their branded product, the third party will have the option to certify to the FDA that, in the opinion of that third party, the patents listed in the Orange Book for our partner's branded product are invalid, unenforceable, or will not be infringed by the manufacture, use or sale of the third party's generic drug product. A third party certification that a new product will not infringe Orange Book-listed patents, or that such patents are invalid, is called a paragraph IV patent certification. If the third party submits a paragraph IV patent certification to the FDA, a notice of the paragraph IV patent certification must be sent to the NDA owner and the owner of the patents that are subject to the paragraph IV patent certification notice once the third-party's NDA or ANDA is accepted for filing by the FDA. A lawsuit may then be initiated to defend the patents identified in the notice. The filing of a patent infringement lawsuit within 45 days of the receipt of notice of a paragraph IV patent certification automatically prevents the FDA from approving the generic NDA or ANDA until the earlier of the expiration of a 30-month period, the expiration of the patents, the entry of a settlement order stating that the patents are invalid or not infringed, a decision in the infringement case that is favorable to the NDA or ANDA applicant, or such shorter or longer period as the court may order. If a patent infringement lawsuit is not initiated within the required 45-day period, the third-party's NDA or ANDA will not be subject to the 30-month stay.

Several third-parties have challenged, and additional third parties may challenge, the patents covering our partner's branded products, including Promacta, Kyprolis and Evomela, which could result in the invalidation or unenforceability of some or all of the relevant patent claims. We may from time to time become party to litigation or other proceedings as a result of Paragraph IV certifications. For example, in November 2017, CyDex, our wholly owned subsidiary, received a paragraph IV certification from Teva Pharmaceuticals USA, Inc., Teva Pharmaceutical Industries Ltd. and Actavis, LLC (collectively "Teva") alleging that certain of our patents related to Captisol were invalid, unenforceable and/or will not be infringed by Teva's ANDA related to Spectrum Pharmaceuticals' NDA for Evomela. On December 20, 2017, CyDex filed a complaint against Teva in the U.S. District Court for the District of Delaware, asserting that Teva's ANDA would infringe our patents. On March 22, Teva filed an answer and counterclaims seeking declarations of non-infringement and invalidity as to each of the asserted patents and on April 12, CyDex filed an answer to Teva's counterclaims.

In addition, we cannot assure you that all of the potentially relevant prior art-information that was or is deemed available to a person of skill in the relevant art prior to the priority date of the claimed invention-relating to our and our partners' patents and patent applications has been found. If such prior art exists, it can invalidate a patent or prevent a patent from issuing from a pending patent application, and we or our partners may be subject to a third party pre-issuance submission of prior art to the United States Patent and Trademark Office. Even if patents do successfully issue and even if such patents cover our or our partner's products or potential products, third parties may an initiate litigation or opposition, interference, re-examination, post-grant review, inter partes review, nullification or derivation action in court or before patent offices, or similar proceedings challenging the validity, enforceability or scope of such patents, which may result in the patent claims being narrowed or

invalidated, may allow third parties to commercialize our or our partners' products and compete directly with us and our partners, without payment to us or our partners, or limit the duration of the patent protection of our and our partners' technology and products. For example, we are aware that a third party has requested a reexamination of U.S. Patent No. 8,703,485 related to OmniAb on the basis of certain prior art documents. If the United States Patent and Trademark Office grants the request, we will have an opportunity to respond, but we cannot assure you that this patent will be held to be valid.

Litigation or other proceedings to enforce or defend intellectual property rights are often very complex in nature, may be very expensive and time-consuming, may divert our management's attention from our core business, and may result in unfavorable results that could adversely impact our ability to prevent third parties from competing with our partner's products. Any adverse outcome of such litigation or other proceeding could result in one or more or our patents being held invalid or unenforceable, which could adversely affect our ability to successfully execute our business strategy and negatively impact our financial condition and results of operations. However, given the unpredictability inherent in litigation, we cannot predict or guarantee the outcome of these matters or any other litigation. Regardless of how these matters are ultimately resolved, these matters may be costly, time-consuming and distracting to our management, which could have a material adverse effect on our business.

In addition, periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and or applications will be due to the U.S. and various foreign patent offices at various points over the lifetime of our and our licensees' patents and/or applications. We have systems in place to remind us to pay these fees, and we rely on our outside patent annuity service to pay these fees when due. Additionally, the U.S. and various foreign patent offices require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. We employ reputable law firms and other professionals to help us comply, and in many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with rules applicable to the particular jurisdiction. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or
complete loss of patent rights in the relevant jurisdiction. If such an event were to occur, it could have a material adverse effect on our business.

Any conflicts with the patent rights of others could significantly reduce the coverage of our patents or limit our ability to obtain meaningful patent protection. For example, our European patent related to Agglomerated forms of Captisol was limited during an opposition proceeding, and the rejection of our European patent application related to High Purity Captisol was upheld on appeal. In addition, any determination that our patent rights are invalid may result in early termination of our agreements with our license partners and could adversely affect our ability to enter into new license agreements. We also rely on unpatented trade secrets and know-how to protect and maintain our competitive position. We require our employees, consultants, licensees and others to sign confidentiality agreements when they begin their relationship with us. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our competitors may independently discover our trade secrets.

We may also need to initiate litigation, which could be time-consuming and expensive, to enforce our proprietary rights or to determine the scope and validity of others' rights. If this occurs, a court may find our patents or those of our licensors invalid or may find that we have infringed on a competitor's rights. In addition, if any of our competitors have filed patent applications in the United States which claim technology we also have invented, the United States Patent and Trademark Office may require us to participate in expensive interference proceedings to determine who has the right to a patent for the technology.

The occurrence of any of the foregoing problems could be time-consuming and expensive and could adversely affect our financial position, liquidity and results of operations.

We rely heavily on licensee relationships, and any disputes or litigation with our partners or termination or breach of any of the related agreements could reduce the financial resources available to us, including milestone payments and future royalty revenues.

Our existing collaborations may not continue or be successful, and we may be unable to enter into future collaborative arrangements to develop and commercialize our unpartnered assets. Generally, our current collaborative partners also have the right to terminate their collaborations at will or under specified circumstances. If any of our collaborative partners breach or terminate their agreements with us or otherwise fail to conduct their collaborative activities successfully (for example, by not making required payments when due, or at all), our product development under these agreements will be delayed or terminated. Disputes or litigation may also arise with our collaborators (with us and/or with one or more third parties), including those over ownership rights to intellectual property, know-how or technologies developed with our collaborators. For example, we are

asserting our rights to receive payment against one of our collaborative partners which could harm our relationship with such partner. Such disputes or litigation could adversely affect our rights to one or more of our product candidates and could delay, interrupt or terminate the collaborative research, development and commercialization of certain potential products, create uncertainty as to ownership rights of intellectual property, or could result in litigation or arbitration. In addition, a significant downturn or deterioration in the business or financial condition of our collaborators or partners could result in a loss of expected revenue and our expected returns on investment. The occurrence of any of these problems could be time-consuming and expensive and could adversely affect our business.

Our product candidates, and the product candidates of our partners, face significant development and regulatory hurdles prior to partnering and/or marketing which could delay or prevent licensing, sales-based royalties and/or milestone revenue.

Before we or our partners obtain the approvals necessary to sell any of our unpartnered assets or partnered programs, we must show through preclinical studies and human testing that each potential product is safe and effective. We and/or our partners have a number of partnered programs and unpartnered assets moving toward or currently awaiting regulatory action. Failure to show any product's safety and effectiveness could delay or prevent regulatory approval of a product and could adversely affect our business. The drug development and clinical trials process is complex and uncertain. For example, the results of preclinical studies and initial clinical trials may not necessarily predict the results from later large-scale clinical trials. In addition, clinical trials may not demonstrate a product's safety and effectiveness to the satisfaction of the regulatory authorities. A number of companies have suffered significant setbacks in advanced clinical trials or in seeking regulatory approvals, despite promising results in earlier trials. The FDA may also require additional clinical trials after regulatory approvals are received. Such additional trials may be expensive and time-consuming, and failure to successfully conduct those trials could jeopardize continued commercialization of a product.

The speed at which we and our partners complete our scientific studies and clinical trials depends on many factors, including, but not limited to, the ability to obtain adequate supplies of the products to be tested and patient enrollment. Patient enrollment is a function of many factors, including the size of the patient population, the proximity of patients to clinical sites, the eligibility criteria for the trial and other potential drug candidates being studied. Delays in patient enrollment for our or our partners' trials may result in increased costs and longer development times. In addition, our partners have rights to control product development and clinical programs for products developed under our collaborations. As a result, these partners may conduct these programs more slowly or in a different manner than expected. Moreover, even if clinical trials are completed, we or our partners still may not apply for FDA or foreign regulatory approval in a timely manner or the FDA or foreign regulatory authority still may not grant approval.

Our drug discovery, early-stage drug development, and product reformulation programs may require substantial additional capital to complete successfully. Our partner's drug development programs may require substantial additional capital to complete successfully, arising from costs to: conduct research, preclinical testing and human studies; establish pilot scale and commercial scale manufacturing processes and facilities; and establish and develop quality control, regulatory, marketing, sales and administrative capabilities to support these programs. While we expect to fund our research and development activities from cash generated from operations to the extent possible, if we are unable to do so, we may need to complete additional equity or debt financings or seek other external means of financing. These financings could depress our stock price. If additional funds are required to support our operations and we are unable to obtain them on terms favorable to us, we may be required to cease or reduce further development or commercialization of our products, to sell some or all of our technology or assets or to merge with another entity.

Our OmniAb antibody platform faces specific risks, including the fact that no drug using antibodies from the platform has yet advanced to late stage clinical trials.

None of our collaboration partners using our OmniAb antibody platform have tested drugs based on the platform in late stage clinical trials and, therefore, none of our OmniAb collaboration partners' drugs have received FDA approval. If one of our OmniAb collaboration partners' drug candidates fails during preclinical studies or clinical trials, our other OmniAb collaboration partners may decide to abandon drugs using antibodies generated from the OmniAb platform, whether or not attributable to the platform. All of our OmniAb collaboration partners may terminate their programs at any time without penalty. In addition, our OmniRat and OmniFlic platforms, which we consider the most promising, are covered by two patents within the U.S. and two patents in the European Union and are subject to the same risks as our patent portfolio discussed above, including the risk that our patents may infringe on third party patent rights or that our patents may be invalidated. Further, we face significant competition from other companies selling human antibody-generating rodents, especially mice which compete with our OmniMouse platform, including the VelocImmune mouse, the AlivaMab mouse, the Trianni mouse and the Kymouse.

Many of our competitors have greater financial, technical and human resources than we do and may be better equipped to develop, manufacture and market competing antibody platforms.

If plaintiffs bring product liability lawsuits against us or our partners, we or our partners may incur substantial liabilities and may be required to limit commercialization of our approved products and product candidates.

As is common in our industry, our partners and we face an inherent risk of product liability as a result of the clinical testing of our product candidates in clinical trials and face an even greater risk for commercialized products. Although we are not currently a party to product liability litigation, if we are sued, we may be held liable if any product or product candidate we develop causes injury or is found otherwise unsuitable during product testing, manufacturing, marketing or sale. Regardless of merit or eventual outcome, liability claims may result in decreased demand for any product candidates, partnered products or products that we may develop, injury to our reputation, discontinuation of clinical trials, costs to defend litigation, substantial monetary awards to clinical trial participants or patients, loss of revenue and product recall or withdrawal from the market and the inability to commercialize any products that we develop. We have product liability insurance that covers our clinical trials up to a $10.0 million annual limit. Our insurance coverage may not be sufficient to cover all of our product liability related expenses or losses and may not cover us for any expenses or losses we may suffer. If we are sued for any injury caused by our product candidates, partnered products or any future products, our liability could exceed our total assets.

Market acceptance and sales of any approved product will depend significantly on the availability and adequacy of coverage and reimbursement from third-party payors and may be affected by existing and future healthcare reform measures.

Sales of the products we license to our collaboration partners and the royalties we receive will depend in large part on the extent to which coverage and reimbursement is available from government and health administration authorities, private health maintenance organizations and health insurers, and other healthcare payors. Significant uncertainty exists as to the reimbursement status of healthcare products. Healthcare payors, including Medicare, are challenging the prices charged for medical products and services. Government and other healthcare payors are increasingly attempting to contain healthcare costs by limiting both coverage and the level of reimbursement for medical products. Even if a product is approved by the FDA, insurance coverage may not be available, and reimbursement levels may be inadequate, to cover the costs associated with the research, development, marketing and sale of the product. If government and other healthcare payors do not provide adequate coverage and reimbursement levels for any product, market acceptance and any sales could be reduced.

From time to time, legislation is implemented to reign in rising healthcare expenditures. By way of example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA, was enacted, which included a number of provisions affecting the pharmaceutical industry, including, among other things, annual, non-deductible fees on any entity that manufactures or imports some types of branded prescription drugs and increases in Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program. Since its enactment, there have been judicial and Congressional challenges to certain aspects of the ACA, and we expect there will be additional challenges and amendments to the ACA in the future.

Other legislative changes have been proposed and adopted since the ACA was enacted, including aggregate reductions of Medicare payments to providers of 2% per fiscal year and reduced payments to several types of Medicare providers. Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed bills designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drug products. Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, designed to encourage importation from other countries and bulk purchasing. We cannot predict whether other legislative changes will be adopted, if any, or how such changes would affect our operations or financial condition.

We and our collaboration partners may be subject to federal and state healthcare laws, including fraud and abuse, false claims, physician payment transparency and health information privacy and security laws. Our operations and those of our collaboration partners are subject to various federal and state fraud and abuse laws, including, without limitation, anti-kickback, false claims and physician payment transparency statutes. These laws may impact, among other things, financial arrangements with physicians, sales, marketing and education programs and the manner in any of those activities are implemented. In addition, we may be subject to federal and state patient privacy regulations. If our operations or those of our collaboration partners are found to be in violation of any of those laws or any other applicable governmental regulations, we or our

collaboration partners may be subject to penalties, including civil and criminal penalties, damages, fines, imprisonment, exclusion from government healthcare programs or the curtailment or restructuring of operations, any of which could adversely affect our ability to operate our business and our financial condition.

Any difficulties from strategic acquisitions could adversely affect our stock price, operating results and results of operations.

We may acquire companies, businesses and products that complement or augment our existing business. We may not be able to integrate any acquired business successfully or operate any acquired business profitably. Integrating any newly acquired business could be expensive and time-consuming. Integration efforts often take a significant amount of time, place a significant strain on managerial, operational and financial resources and could prove to be more difficult or expensive than we predict. The diversion of our management's attention and any delay or difficulties encountered in connection with any future acquisitions we may consummate could result in the disruption of our on-going business or inconsistencies in standards and controls that could negatively affect our ability to maintain third-party relationships. Moreover, we may need to raise additional funds through public or private debt or equity financing, or issue additional shares, to acquire any businesses or products, which may result in dilution for stockholders or the incurrence of indebtedness.

As part of our efforts to acquire companies, business or product candidates or to enter into other significant transactions, we conduct business, legal and financial due diligence with the goal of identifying and evaluating material risks involved in the transaction. Despite our efforts, we ultimately may be unsuccessful in ascertaining or evaluating all such risks and, as a result, might not realize the intended advantages of the transaction. If we fail to realize the expected benefits from acquisitions we may consummate in the future or have consummated in the past, whether as a result of unidentified risks, integration difficulties, regulatory setbacks, litigation with current or former employees and other events, our business, results of operations and financial condition could be adversely affected. If we acquire product candidates, we will also need to make certain assumptions about, among other things, development costs, the likelihood of receiving regulatory approval and the market for such product candidates. Our assumptions may prove to be incorrect, which could cause us to fail to realize the anticipated benefits of these transactions.

In addition, we will likely experience significant charges to earnings in connection with our efforts, if any, to consummate acquisitions. For transactions that are ultimately not consummated, these charges may include fees and expenses for investment bankers, attorneys, accountants and other advisors in connection with our efforts. Even if our efforts are successful, we may incur, as part of a transaction, substantial charges for closure costs associated with elimination of duplicate operations and facilities and acquired IPR&D charges. In either case, the incurrence of these charges could adversely affect our results of operations for particular quarterly or annual periods.

Changes or modifications in financial accounting standards, including those related to revenue recognition, may harm our results of operations.

From time to time, the FASB either alone or jointly with other organizations, promulgates new accounting principles that could have an adverse impact on our results of operations. For example, in May 2014, FASB issued a new accounting standard for revenue recognition-Accounting Standards Codification Topic 606, Revenue from Contracts with Customers, or ASC 606-that supersedes most current revenue recognition guidance. The new guidance requires a company to recognize revenue upon transfer of goods or services to a customer at an amount that reflects the expected consideration to be received in exchange for those goods or services. The new guidance is effective in the first quarter of 2018.

This standard has a material impact on our consolidated financial statements by accelerating the timing of revenue recognition for revenues related to royalties, and potentially certain contingent milestone based payments. Our practice has been to book royalties one quarter after our partners report sales of the underlying product. Now, under ASC 606, Ligand estimates and books royalties in the same quarter that our partners report the sale of the underlying product. As a result, we now book royalties one quarter earlier compared to our past practice. We rely on our partners' earning releases and other information from our partners to determine the sales of our partners' products and to estimate the related royalty revenues. If our partners report incorrect sales, or if our partners delay reporting of their earnings release, our royalty estimates may need to be revised and/or our financial reporting may be delayed.

Any difficulties in implementing this guidance could cause us to fail to meet our financial reporting obligations, which could result in regulatory discipline and harm investors' confidence in us. Finally, if we were to change our critical accounting estimates, including those related to the recognition of license revenue and other revenue sources, our operating results could be significantly affected.

Uncertainties in the interpretation and application of the 2017 Tax Cuts and Jobs Act could materially affect our tax obligations and effective tax rate.

The 2017 Tax Cuts and Jobs Act (the Tax Act) was enacted on December 22, 2017, and significantly affected U.S. tax law by changing how the U.S. imposes income tax on corporations, including by reducing the U.S. corporate income tax rate. The U.S. Department of Treasury has broad authority to issue regulations and interpretative guidance that may significantly impact how we will apply the law and impact our results of operations in the period issued.

The Tax Act requires certain complex computations not previously provided in U.S. tax law. As such, the application of accounting guidance for such items is currently uncertain. Further, compliance with the Tax Act and the accounting for such provisions require accumulation of certain information not previously required or regularly produced. As a result, we have provided a provisional estimate on the effect of the Tax Act in our financial statements. As additional regulatory guidance is issued by the applicable taxing authorities, as accounting treatment is clarified, as we perform additional analysis on the application of the law, and as we refine estimates in calculating the effect, our final analysis, which will be recorded in the period completed, may be different from our current provisional amounts, which could materially affect our tax obligations and effective tax rate.

Our ability to use our net operating loss carryforwards and certain other tax attributes to offset future taxable income may be subject to certain limitations.

As of December 31, 2017 we had U.S. federal and state net operating loss carryforwards (NOLs) of approximately $388 million and $127 million, respectively, which expire through 2036, if not utilized. As of December 31, 2017, we had federal and California research and development tax credit carryforwards of approximately $24 million and $21 million, respectively. The federal research and development tax credit carryforwards expire in various years through 2036, if not utilized. The California research and development credit will carry forward indefinitely. Under Sections 382 and 383 of Internal Revenue Code of 1986, as amended (Code) if a corporation undergoes an “ownership change,” the corporation’s ability to use its pre-change NOLs and other pre-change tax attributes, such as research tax credits, to offset its future post-change income and taxes may be limited. In general, an “ownership change” occurs if there is a cumulative change in our ownership by “5% shareholders” that exceeds 50 percentage points over a rolling three-year period. Similar rules may apply under state tax laws. We believe we have experienced certain ownership changes in the past and have reduced our deferred tax assets related to NOLs and research and development tax credit carryforwards accordingly. In the event that it is determined that we have in the past experienced additional ownership changes, or if we experience one or more ownership changes as a result future transactions in our stock, then we may be further limited in our ability to use our NOLs and other tax assets to reduce taxes owed on the net taxable income that we earn in the event that we attain profitability. Furthermore, under recently enacted U.S. tax legislation, although the treatment of tax losses generated before December 31, 2017 has generally not changed, tax losses generated in calendar year 2018 and beyond may only offset 80% of our taxable income. This change may require us to pay federal income taxes in future years despite generating a loss for federal income tax purposes in prior years. Any such limitations on the ability to use our NOLs and other tax assets could adversely impact our business, financial condition and operating results.

We rely on information technology and any failure, inadequacy, interruption or security lapse of that technology, including any cyber security incidents, could harm our ability to operate our business effectively.

Our business is increasingly dependent on critical, complex and interdependent information technology systems, including internet-based systems, to support business processes as well as internal and external communications. Despite the implementation of security measures, our internal computer systems and those of our partners are vulnerable to damage from cyber-attacks, computer viruses, security breaches, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. System failures, accidents or security breaches could cause interruptions in our operations, could lead to the loss of trade secrets or other intellectual property, could lead to the public exposure of personal information of our employees and others, and could result in a material disruption of our clinical and commercialization activities and business operations, in addition to possibly requiring substantial expenditures to remedy. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and our business and financial condition could be harmed.

The occurrence of a catastrophic disaster could damage our facilities beyond insurance limits or we could lose key data which could cause us to curtail or cease operations.

We are vulnerable to damage and/or loss of vital data from natural disasters, such as earthquakes, tornadoes, power loss, fire, floods and similar events, as well as from accidental loss or destruction. If any disaster were to occur, our ability to operate our business could be seriously impaired. We have property, liability, and business interruption insurance which may not be adequate to cover our losses resulting from disasters or other similar significant business interruptions, and we do not plan to purchase additional insurance to cover such losses due to the cost of obtaining such coverage. Any significant losses that are not recoverable under our insurance policies could seriously impair our business, financial condition and prospects.

In August 2014, we issued $245.0 million principal amount of 2019 Notes and in May 2018, we issued $750.0 million principal amount of 2023 Notes. Conversion of our outstanding convertible notes may result in losses, result in the dilution of existing stockholders, create downward pressure on the price of our common stock, and restrict our ability to take advantage of future opportunities.

The sale of the 2019 Notes and 2023 Notes may affect our earnings per share figures, as accounting procedures require that we include in our calculation of earnings per share the number of shares of our common stock into which the 2019 Notes and 2023 Notes are convertible. The convertible notes may be converted into cash and shares of our common stock, if any (subject to our right or obligation to pay cash in lieu of all or a portion of such shares). If shares of our common stock are issued to the holders of the convertible notes upon conversion, there will be dilution to our shareholders' equity and the market price of our shares may decrease due to the additional selling pressure in the market. Any downward pressure on the price of our common stock caused by the sale or potential sale of shares issuable upon conversion of the convertible notes could also encourage short sales by third parties, creating additional selling pressure on our stock. Upon the occurrence of certain circumstances, holders of the convertible notes may require us to purchase all or a portion of their notes for cash, which may require the use of a substantial amount of cash. In addition, we must use cash to settle the principal and any premium due upon conversion of the 2019 Notes for any conversion notices received on or after May 22, 2018. If such cash is not available, we may be required to sell other assets or enter into alternate financing arrangements at terms that may or may not be desirable. The existence of the convertible notes and the obligations that we incurred by issuing them may restrict our ability to take advantage of certain future opportunities, such as engaging in future debt or equity financing activities.

As of June 30, 2018, we had $223.2 million aggregate principal amount of convertible notes due 2019, and $750 million aggregate principal amount of convertible notes due 2023 outstanding. The notes are convertible into cash, and if applicable, shares of our common stock under certain circumstances, including trading price conditions related to our common stock. Upon conversion, we are required to record a gain or loss for the difference between the fair value of the notes to be extinguished and their corresponding net carrying value. The fair value of the notes to be extinguished depends on our current incremental borrowing rate. The net carrying value of our notes has an implicit interest rate of 5.83% with respect to the 2019 Notes, and 5.55% with respect to the 2023 Notes. If our incremental borrowing rate at the time of conversion is lower than the implied interest rate of the notes, we will record a loss in our consolidated statement of income during the period in which the notes are converted.

In March and April 2018, we received notices for conversion of $21.8 million of principal amount of the 2019 Notes which were settled in May and June 2018. In July 2018, we received notices for conversion of $49.9 million of principal amount of the 2019 Notes which are expected to settle in October 2018.

Impairment charges pertaining to goodwill, identifiable intangible assets or other long-lived assets from our mergers and acquisitions could have an adverse impact on our results of operations and the market value of our common stock.

The total purchase price pertaining to our acquisitions in recent years of CyDex, Metabasis, Neurogen, OMT and Crystal have been allocated to net tangible assets, identifiable intangible assets, in-process research and development and goodwill. To the extent the value of goodwill or identifiable intangible assets or other long-lived assets become impaired, we will be required to incur material charges relating to the impairment. Any impairment charges could have a material adverse impact on our results of operations and the market value of our common stock.

Our charter documents and concentration of ownership may hinder or prevent change of control transactions.

Provisions contained in our certificate of incorporation and bylaws may discourage transactions involving an actual or potential change in our ownership. In addition, our Board of Directors may issue shares of common or preferred stock without

any further action by the stockholders. Our directors and certain of our institutional investors collectively beneficially own a significant portion of our outstanding common stock. Such provisions and issuances may have the effect of delaying or preventing a change in our ownership. If changes in our ownership are discouraged, delayed or prevented, it would be more difficult for our current Board of Directors to be removed and replaced, even if you or our other stockholders believe that such actions are in the best interests of us and our stockholders.

Our stock price has been volatile and could experience a sudden decline in value.

The market prices for securities of biotechnology and pharmaceutical companies have historically been highly volatile, and the market has recently experienced significant price and volume fluctuations that are unrelated to the operating performance of particular companies. Continued volatility in the overall capital markets could reduce the market price of our common stock in spite of our operating performance. Further, high stock price volatility could result in higher stock-based compensation expense.

Our common stock has experienced significant price and volume fluctuations and may continue to experience volatility in the future. Many factors may have a significant impact on the market price of our common stock, including, but not limited to, the following factors: results of or delays in our preclinical studies and clinical trials; the success of our collaboration agreements; publicity regarding actual or potential medical results relating to products under development by us or others; announcements of technological innovations or new commercial products by us or others; developments in patent or other proprietary rights by us or others; comments or opinions by securities analysts or major stockholders or changed securities analysts' reports or recommendations; future sales or shorting of our common stock by existing stockholders; regulatory developments or changes in regulatory guidance; litigation or threats of litigation; economic and other external factors or other disaster or crises; the departure of any of our officers, directors or key employees; period-to-period fluctuations in financial results; and price and volume fluctuations in the overall stock market.

Our results of operations and liquidity needs could be materially negatively affected by market fluctuations and economic downturn.

Our results of operations could be materially negatively affected by economic conditions generally, both in the United States and elsewhere around the world. Concerns over inflation, energy costs, geopolitical issues, the availability and cost of credit, and the U.S. financial markets have in the past contributed to, and may continue in the future contributed to, increased volatility and diminished expectations for the economy and the markets. Domestic and international equity markets periodically experience heightened volatility and turmoil. These events may have an adverse effect on us. In the event of a market downturn, our results of operations could be adversely affected by those factors in many ways, including making it more difficult for us to raise funds if necessary, and our stock price may further decline. We cannot provide assurance that our investments are not subject to adverse changes in market value. If our investments experience adverse changes in market value, we may have less capital to fund our operations.

ITEM 5. Other Information

ITEM 6. EXHIBITS

The Exhibit Index to this Quarterly Report on Form 10-Q is incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Date: August 8, 2018

By: /s/ Matthew Korenberg
Matthew Korenberg
Executive Vice President, Finance and Chief Financial Officer
Duly Authorized Officer and Principal Financial Officer

EXHIBIT INDEX

Exhibit Number	Description
4.1	Supplemental Indenture, dated as of February 20, 2018, between the Company and Wilmington Trust, National Association, as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on July 30, 2018)
4.2	Second Supplemental Indenture, dated as of May 22, 2018, between the Company and Wilmington Trust, National Association, as trustee (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
4.3	Indenture, dated as of May 22, 2018, between the Company and Wilmington Trust, National Association, as trustee, including the form of 0.75% Convertible Senior Notes due 2023 (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018)
10.1	Letter Agreement, dated as of May 17, 2018, between Barclays Capital Inc. and the Company regarding the Base Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.2	Letter Agreement, dated as of May 17, 2018, between Barclays Capital Inc. and the Company regarding the Base Warrant Transaction (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018)..
10.3	Letter Agreement, dated as of May 17, 2018, between Deutsche Bank AG and the Company regarding the Base Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.3 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.4	Letter Agreement, dated as of May 17, 2018, between Deutsche Bank AG and the Company regarding the Base Warrant Transaction (incorporated by reference to Exhibit 10.4 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.5	Letter Agreement, dated as of May 17, 2018, between Goldman Sachs & Co. LLC and the Company regarding the Base Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.5 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.6	Letter Agreement, dated as of May 17, 2018, between Goldman Sachs & Co. LLC and the Company regarding the Base Warrant Transaction (incorporated by reference to Exhibit 10.6 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.7	Letter Agreement, dated as of May 18, 2018, between Barclays Capital Inc. and the Company regarding the Additional Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.7 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.8	Letter Agreement, dated as of May 18, 2018, between Barclays Capital Inc. and the Company regarding the Additional Warrant Transaction (incorporated by reference to Exhibit 10.8 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.9	Letter Agreement, dated as of May 18, 2018, between Deutsche Bank AG and the Company regarding the Additional Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.9 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.10	Letter Agreement, dated as of May 18, 2018, between Deutsche Bank AG and the Company regarding the Additional Warrant Transaction (incorporated by reference to Exhibit 10.10 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.11	Letter Agreement, dated as of May 18, 2018, between Goldman Sachs & Co. LLC and the Company regarding the Additional Convertible Note Hedge Transaction (incorporated by reference to Exhibit 10.11 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.12	Letter Agreement, dated as of May 18, 2018, between Goldman Sachs & Co. LLC and the Company regarding the Additional Warrant Transaction (incorporated by reference to Exhibit 10.12 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on May 22, 2018).
10.13†	Platform License Agreement, dated March 23, 2015, by and between Open Monoclonal Technology, Inc. and WuXi AppTec Biopharmaceuticals Co., Ltd.
10.14†	Amendment Number 1 to Platform License Agreement, dated June 11, 2017, by and between Open Monoclonal Technology, Inc. and WuXi Biologics (Hong Kong) Limited (as successor-in-interest to WuXi AppTec Biopharmaceuticals Co., Ltd.).
10.15†	Amendment Number 2 to Platform License Agreement, dated June 25, 2018, by and between Open Monoclonal Technology, Inc. and WuXi Biologics Ireland Limited (as successor-in-interest to WuXi Biologics (Hong Kong) Limited).
31.1	Certification by Principal Executive Officer, Pursuant to Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification by Principal Financial Officer, Pursuant to Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.

Exhibit Number	Description
32.1	Certifications by Principal Executive Officer and Principal Financial Officer, Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

† Confidential treatment has been requested for portions of this exhibit. These portions have been omitted and submitted separately to the Securities and Exchange Commission.

Exhibit 10.13

*** Text Omitted and Filed Separately with the Securities and Exchange Commission. Confidential Treatment Requested Under 17 C.F.R. Sections 200.80(b)(4) and 240.24b-2.

PLATFORM LICENSE AGREEMENT

This Platform License Agreement ("Agreement") is entered into effective March 23, 2015, 2015 ("Effective Date") by OMT, Inc. ("OMT"), having its principal place of business at 2747 Ross Road, Suite A, Palo Alto, CA 94303, and WuXi AppTec Biopharmaceuticals Co., Ltd. ("Licensee"), having its principal place of business at 108 Meiliang Rd., Mashan, Wuxi, P.R. China. In consideration of the mutual covenants and promises set forth in this Agreement, the parties agree as follows:

1. Definitions.

1.1 "Affiliate" means, with respect to a party, any Person that, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such party. For purposes of this definition, the term "control" (including, the correlative meanings, "controlled by" and "under common control with") means (a) the direct or indirect ownership of more than fifty percent (50%) of the stock or other equity having the right to vote for directors thereof (or general partnership interests) or (b) the ability to otherwise control the decisions of the board of directors or equivalent governing body thereof.

1.2 "Animals" means OmniRat, OmniMouse, and OmniFlic organisms that have been delivered to Licensee by or on behalf of OMT hereunder, and any progeny of such delivered organisms generated by or on behalf of Licensee or any Outlicensee.

1.3 "Antibody(ies)" means a molecule or a gene encoding a molecule comprising or containing one or more immunoglobulin variable domains or parts of such domains, or any existing or future fragments, variants, fusion proteins, modifications or derivatives of such molecule or gene, generated by or on behalf of Licensee in connection with the Animals, which the parties agree include the Existing Antibodies. Notwithstanding anything to the contrary, use of the term "Antibodies" hereunder does not include Animal Improvements.

1.4 "Approved Affiliate" means an Affiliate of Licensee that is listed on Exhibit B, only for such period as such entity is an Affiliate of Licensee.

1.5 "Approved Subcontractor" has the meaning given to it in Section 3.3.

1.6 "China" means mainland China, Hong Kong, Macau, and Taiwan.

1.7 "China Plus Territory" means Korea, India, and Russia.

1.8 "China Outlicensee" means a third party that is located in China who executes a China Outlicensing Agreement in accordance with Section 4.3(a), who is authorized to develop and market an Antibody in China, and, upon execution and delivery of a China Plus Addendum, in the applicable China Plus Territory.

1.9 "Existing Antibodies" means antibodies against targets of PD-1, PD-L1, and PCSK9 which have been generated under the Development and Commercialization Agreement by and beteen the parties dated August 20, 2012.

1.10 "Net Sales" means the gross amounts invoiced by or for Outlicensees and their licensees (each, a "Selling Party") for the disposition of a unit of Product to a third party end user (the "Gross Sales Price"), after deduction (if not already deducted in the amount invoiced) of the following expenses paid by the Selling Party for such Product that are each actually incurred and itemized on such invoice by the Selling Party: (i) freight, shipping, transportation and insurance costs; (ii) discounts, in reasonable amounts that are customary in the trade, that are actually given to buying groups, health care insurance carriers, chain pharmacies, mass merchandisers, staff model HMOs, pharmacy benefit managers, and other similar wholesalers and distributors, for quantity purchases and prompt payment; (iii) tax, including sales, use, turnover, excise, import and other taxes, customs or duties borne by the Selling Party imposed by a governmental agency on such disposition, and (iv) credits or allowances actually given or made with respect to a Product by reason of rejection, defects, recalls, returns, rebates, or uncollectable amounts ((i)-(iv) together, "Permitted Deductions"). A Selling Party shall not dispose of any Product for any consideration other than monetary consideration and on bona fide arm's length terms, without the prior written agreement of OMT and Licensee (that describes in reasonable detail the basis for calculation of Net Sales based on such a transaction).

1.11 "New Antibodies" means Antibodies that are not Existing Antibodies.

1.12 "OmniFlic" means a rat that has been genetically modified by OMT to have inactivated endogenous immunoglobin loci and transgenic immunoglobin loci with a rearranged light chain locus. For clarity, OmniFlic is an organism distinct from OmniRat.

1.13 "OmniMouse" means a mouse that has been genetically modified by OMT to have inactivated endogenous immunoglobulin loci and transgenic immunoglobulin loci.

1.14 "OmniRat" means a rat that has been genetically modified by OMT to have inactivated endogenous immunoglobulin loci and transgenic immunoglobulin loci.

1.15 "Person" means any person or entity.

1.16 "Product" means a pharmaceutical product developed through the use (directly or indirectly) of Antibodies. Notwithstanding anything to the contrary, use of the term "Product" hereunder does not include Animal Improvements.

1.17 "Outlicensing Agreements" means China Outlicensing Agreements and Ex-China Outlicensing Agreements.

1.18 "Outlicensee" means China Outlicensees and Ex-China Outlicensees.

1.19 "Royalty Term" means, on a Product-by-Product and country-by-country basis, the period beginning on the First Commercial Sale of a Product in such country and ending

upon the expiration of the last patent that is subject to Section 4.2 covering the manufacture, use, sale, offer for sale or import of such Product in such country.

1.20 "Territory" means, with respect to Licensee, China, and with respect to OMT, anywhere outside of China.

2. Termination & Replacement.

The previous agreements between the parties, i.e. the Development and Commercialization Agreement by and between the parties dated August 20, 2012, and the Strategic Commercial Partner Agreement by and between the parties dated February 22, 2013, are hereby terminated and replaced by the terms and conditions of this Agreement.

3. Delivery and Maintenance of Animals.

3.1 Delivery of Animals. OMT shall use commercially reasonable efforts to deliver to Licensee or authorize OMT's authorized animal breeder ("Breeder"), currently Charles River Laboratories, Inc. ("Charles River") to deliver to Licensee Animals in accordance with Licensee's written purchase order(s) therefor (each an "Order") designating the number and shipment terms for such Animals. If OMT authorizes a Breeder to deliver Animals to Licensee, such Orders shall be issued pursuant to an agreement between Licensee and the applicable Breeder (a "Delivery Agreement"). All Delivery Agreements (and any amendments thereto) are subject to OMT's prior written approval, such approval not to be unreasonably withheld (and OMT reserves the right to approve any Orders issued pursuant thereto); no Delivery Agreement may contain terms regarding the use, housing, and maintenance of Animals that conflict with the terms herein (including without limitation any restrictions on housing facilities). All Orders to be fulfilled by OMT are subject to OMT's prior written approval, such approval not to be unreasonably withheld, and such Orders shall be subject to Licensee's acceptance of Breeder's standard terms, conditions, disclaimers and limitations and acknowledgement that OMT shall not be liable for any Animals delivered to Licensee by the applicable Breeder (provided the foregoing shall not excuse OMT from any of its obligations set forth in this Agreement). Licensee shall not obtain Animals from any source other than OMT or OMT's then-authorized Breeder. Licensee may not request, and neither OMT nor a Breeder will fulfill, Orders for delivery directly to Approved Subcontractors or Approved Affiliates. For clarity, any Animal received hereunder is licensed, not sold. If Animals are received pursuant to a Delivery Agreement, Licensee shall pay to the applicable Breeder the amount(s) specified from time to time by such Breeder pursuant to the terms of such Delivery Agreement; if Animals are received pursuant to an Order fulfilled by OMT, Licensee shall pay to OMT the amount specified from time to time for each such Animal, payable within thirty (30) days of Licensee's receipt of an invoice therefor. OMT will use commercially reasonable efforts to ensure that Licensee is provided enough Animals to support its licensing rights under Section 4 of this Agreement.

3.2 Maintenance; Annual Report. Licensee shall (and shall cause Approved Affiliates and Approved Subcontractors to) maintain the Animals in a secure environment and comply with all OMT guidelines regarding the housing and maintenance of Animals, the current version of which are set forth in Exhibit A. Licensee shall not (and shall not allow any Approved Affiliate or any Approved Subcontractor to) house or maintain the Animals in any facility that

has not been expressly approved in writing in advance by OMT. Without limiting the foregoing, Licensee shall permit OMT, upon five (5) business days' notice, during normal business hours, to access Licensee's facilities for the purpose of examining and verifying Licensee's compliance with the provisions of this Agreement with respect to the use and maintenance of the Animals; Licensee shall require Approved Affiliates and its and their respective Approved Subcontractors to afford OMT the same rights granted by Licensee in the previous sentence. Additionally, within thirty (30) days after each anniversary of the Effective Date, Licensee shall deliver to OMT a written report, in a form reasonably acceptable to OMT, detailing the progress of Licensee's (and its Approved Affiliates and its and their respective Approved Subcontractors' and, with respect to Antibodies only, its China Oulicensees') research and development activities related to the Animals and Antibodies, during the previous twelve (12) month period. Such report shall, at a minimum: (i) describe the manner in which Licensee (and its Approved Affiliates and its and their respective Approved Subcontractors) are keeping and maintaining the Animals, including without limitation identification of each facility in which the Animals are kept and the number of Animals and then in existence and (ii) identify any Antibodies generated by or on behalf of Licensee during such period, and the amino or nucleic acid sequences of the same (all of the foregoing, an "Annual Report").

3.3 Subcontracting; Approved Affiliates. Licensee may use Approved Affiliates in the housing and maintenance of the Animals and the generation of Antibodies (the "Outsourced Services"), or Licensee or such Approved Affiliates may use subcontractors in the Outsourced Services, provided each subcontractor is expressly approved in advance in writing by OMT, including approval of the scope of such subcontractor's work (each, an "Approved Subcontractor"), and provided further that Licensee (a) is responsible and liable for all actions and omissions of Approved Subcontractors and Approved Affiliates as if each were Licensee hereunder and (b) Licensee binds each Approved Subcontractor and Approved Affiliate in writing to terms no less protective of OMT or the Animals (including without limitation any intellectual property right of OMT and any restrictions on housing, use, and maintenance of Animals) than those set forth herein (an "Approved Subcontractor Agreement" or "Approved Affiliate Agreement," as applicable). Licensee shall not permit any (1) Approved Subcontractor to take any action in connection with the Animals that is outside the scope of work approved by OMT under this Agreement or (2) Approved Affiliate from taking any action in connection with the Animals that is outside the scope of the Outsourced Services. OMT agrees that each subcontractor listed in Exhibit B is an Approved Subcontractor of Licensee, but only for the work specified in Exhibit B for such subcontractor, and provided such subcontractor only uses and houses and maintains the Animals at the facility(ies) listed in Exhibit B for such subcontractor. OMT may prohibit any Approved Subcontractor from doing further work for Licensee (even if such Approved Subcontractor is then-currently performing work for Licensee) upon written notice to Licensee, if, in OMT's reasonable belief, such Approved Subcontractor is in breach of (or is incapable of complying with) any of the restrictions set forth herein.

4. Intellectual Property Rights.

4.1 Ownership of and License to Animals.

(a) Subject to compliance with all of the terms and conditions and during the term of this Agreement, OMT hereby grants to Licensee a non-exclusive,

non-transferable (except pursuant to Section 11.2), non-sublicensable license to use the Animals, solely at the facilities that are listed in Exhibit B, and then only for the purpose of researching, developing, and making Antibodies. Licensee shall not (and shall not permit others to) reverse engineer, improve, enhance, or modify the Animals, subject them to testing procedures or protocols that may reveal information regarding genetic traits or other attributes related to the development of the Animals, permit third parties access to the Animals (except for Approved Affiliates and its and their respective Approved Subcontractors during the Term, pursuant to Section 3.3), or breed the Animals or attempt to reverse the sterility of the Animals in any manner.

4.2 Ownership of Antibodies and Products; Patenting.

(a) OMT and Licensee jointly own the Antibodies and any Products (including Products developed by a China Outlicensee or Ex-China Outlicensee) and all intellectual property rights therein, including any patent rights (collectively, "Joint Rights"), and each hereby makes (and will cause each of their respective Oulicensees to make, and, with respect to Licensee, will cause Approved Affiliates and its and their Approved Subcontractors to make) all assignments necessary to achieve the foregoing. Subject to compliance with all terms and conditions of this Agreement, OMT and Licensee hereby grant the other a non-exclusive, irrevocable, perpetual, worldwide, royalty-free, non-transferable (except in accordance with Section 11.2) right and license in and to the Joint Rights, in each case to the extent necessary to achieve such joint ownership and allow each party to exercise its rights hereunder. Each of OMT and Licensee shall, at the request of the other, execute all documents and do all other acts and things as may be reasonably required in order to vest fully and effectively in both OMT and Licensee, jointly, all rights in and to such Joint Rights.

(b) Licensee shall have the right to file, prosecute, and maintain all patent rights within China with respect to the Joint Rights ("China Patent Rights"), provided that Licensee may do the foregoing in a China Outlicensee's name, provided such China Outlicensee is at all times in compliance with the obligations of its China Outlicensing Agreement. Licensee shall use (or, if applicable pursuant to the previous sentence, cause it's China Outlicensee to use) commercially reasonable efforts to so file, prosecute, and maintain such China Patent Rights. Licensee shall, at least fourteen (14) days prior to submission or within fourteen (14) days of receipt (as applicable), forward to OMT copies of any significant office actions, communications, and correspondence relating to the China Patent Rights (including any correspondence of applicable China Outlicensees). OMT shall have the right to comment on and to discuss such prosecution and maintenance activities with Licensee, and Licensee shall consider (and cause the applicable China Outlicensees to consider) OMT's comments in good faith.

(c) OMT shall have the right to file, prosecute, and maintain all patent rights outside of China (including in the China Plus Territory) with respect to the Joint Rights ("Ex-China Patent Rights"), and OMT shall use commercially reasonable efforts to so file, prosecute, and maintain such Ex-China Patent Rights. OMT shall, at least fourteen (14) days prior to submission or within fourteen (14) days of receipt (as applicable), forward to Licensee copies of any significant office actions, communications, and correspondence relating to the Ex-China Patent Rights. Licensee shall have the right to comment on and to discuss such

prosecution and maintenance activities with OMT, and OMT shall consider Licensee's comments in good faith.

4.3 Outlicensing.

(a) Licensee may, in China, generate Antibodies using antigens it selects or provide Antibody generation services to a China Outlicensee using antigens selected by such China Outlicensee. Licensee (i) is responsible and liable for all actions and omissions of China Outlicensees in connection with such Antibodies and (ii) must bind each China Outlicensee to a written agreement that contains terms no less protective of OMT (including its intellectual property rights in the Animals, Antibodies, and Products) than those set forth herein (a "China Outlicensing Agreement"). Licensee may provide any such resulting Antibodies to the applicable China Outlicensee that is bound by a China Outlicensing Agreement. Additionally, Licensee may provide Existing Antibodies to a China Outlicensee that is bound by a written addendum to such China Outlicensing Agreement for use, development, and marketing in the China Plus Territory (a "China Plus Addendum," which shall be deemed a part of the applicable China Outlicensing Agreement). Except as otherwise expressly set forth herein, Licensee may not outlicense or otherwise provide rights in any Antibodies to any third party except for China Outlicensees. Each China Outlicensing Agreement will prohibit the licensing, distribution or other transfer of Antibodies or Products outside of China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) by or on behalf of the applicable China Outlicensee, and shall not grant any exclusive license of any Antibody (except solely for use within China (and, as applicable with respect to Existing Antibodies, the China Plus Territory), where "use" includes development of and distribution of Products) without the prior written consent of OMT.

(b) OMT may license, distribute or otherwise transfer any Antibodies generated by or on behalf of Licensee (including any generated for China Outlicensees) outside of China (excluding China Plus Territory with respect to the Existing Antibodies), each such sublicensee of the Antibodies, an "Ex-China Outlicensee," provided the applicable outlicensing agreement is approved in writing by Licensee (an "Ex-China Outlicensing Agreement"), such approval not to be unreasonably withheld. For clarification purposes, unless otherwise agreed by the parties, OMT agrees that Ex-China Outlicensing Agreements that it enters into will prohibit the Ex-China Outlicensee from selling, manufacturing or exporting into China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) any Product.

As an exception to the immediately preceding paragraph, Licensee may license the Existing Antibody to third parties located in and taking delivery (and for use) of such Existing Antibody in the US, the EU, and Japan, and may license New Antibodies in the China Plus Territory (each, an "Extra-Territory Outlicensee"), provided the applicable outlicensing agreement is approved in advance in writing by OMT (an "Extra-Territory Outlicensing Agreement"), such approval not to be unreasonably withheld, and provided further (i) Licensee is responsible and liable for all actions and omissions of Extra-Territory Outlicensees in connection with such Antibodies and (ii) the Extra-Territory Outlicensing Agreement is in writing and must contain terms no less protective of OMT (including its intellectual property rights in the Animals, Antibodies, and Products) than those set forth herein.

(c) Except as otherwise described in Sections 4.3(a) and (b), if a China Outlicensee provides a written request to Licensee to license an Antibody for a territory outside of China, and OMT has not yet licensed such Antibody outside of China, the parties will discuss such request in good faith, including the applicable financial licensing terms that Licensee would have to pay to expand the China Outlicensee's license to such market(s). OMT reserves the right to approve or deny such request in its sole discretion, provided that the parties agree that for a global license (excluding China) to a specific Antibody the fees associated with such Antibody will not exceed ~~(i) an aggregated $10,000,000 in milestone payments, and (ii) a five percent (5%) royalty on Net Sales~~[***]. For clarification purpose, in this case in the preceding sentence, such China Outlicensee will sign the outlicensing agreement with OMT directly solely for all Ex-China licenses but Licensee will maintain the license with the Outlicensee for the license rights to China, and, if applicable, US, EU, Japan and China Plus Territory with respect to the Existing Antibodies.

(d) Furthermore, Licensee has the right to market and attempt to outlicense an Antibody outside of China in parallel. If a potential client is located by Licensee, Licensee will introduce in writing such opportunities to OMT and provided OMT has not otherwise agreed to license such Antibody, OMT will use reasonable efforts (for a commercially reasonable period of time not to exceed 3 months from the date of such introduction) to negotiate and enter into an outlicensing agreement with such client directly. During this process, OMT will provide the necessary financial terms to Licensee in order to support Licensee's attempts to license the Antibody outside of China.

(e) The two parties shall make commercially reasonable efforts to and in good faith market and out-license the Antibody.

4.4 As between the parties, and without limiting any other available remedy, OMT owns (i) the Animals and (ii) any modification, improvement, enhancement, or progeny of the Animals created in violation of Section 3.14.1(a) above or antibodies created in violation of the same Section, and (iii) any Antibodies or Products distributed outside of China in violation of Section 4.3(a) above ((ii) and (iii) collectively, "Animal Improvements"), and all intellectual property rights in any of the foregoing; Licensee hereby makes (and will cause its Approved Affiliates and its and their Approved Subcontractors, and any China and/or Extra-Territory Outlicensee, as applicable, to make) all assignments necessary to accomplish the foregoing ownership with respect to any Animal Improvements and progeny. Licensee acknowledges and agrees that the Animals, together with any related biological material or substance that is replicated, synthesized or in any way derived from the Animals (including progeny), except for Antibodies, include and constitute valuable trade secrets of OMT, and OMT has used diligent efforts to maintain such items as its trade secrets and Confidential Information.

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

4.5 Enforcement.

(a) Each of OMT and Licensee shall notify the other promptly in writing when each learns of or reasonably suspects infringement of any Joint Right by a third party (an "Infringement"). With respect to any Infringement occurring or suspected to have occurred (i) in China, Licensee, or its China Outlicensee, shall have the first right to enforce any Joint Right and (ii) outside of China, OMT shall have the first right to enforce any Joint Right, and in each case, each party shall at all times keep the other informed as to the status thereof. Each party may, at its own expense, institute suit against any such infringer or alleged infringer within its respective Territory and control, defend and settle such suit in a manner consistent with the terms and provisions hereof, and recover any damages, awards or settlements resulting therefrom, subject to Section 4.5(c).

(b) If a party does not bring suit to enforce the applicable Joint Rights with respect to an Infringement within one-hundred and eighty (180) days of becoming aware that an Infringement exists, then the other party may, in its sole judgment and at its own expense, take steps to enforce any such rights, including instituting suit against any such infringer or alleged infringer, and control, defend and settle such suit in a manner consistent with the terms and provisions hereof, and recover any damages, awards or settlements resulting therefrom, subject to Section 4.5(c) (provided the foregoing shall not limit either party's right to pursue equitable relief at any time in any court of competent jurisdiction in order to protect its rights in the Joint Rights).

(c) With respect to any claim instituted by a party pursuant to Section 4.5(a) or in 4.5(b), the other party (the "Non-Enforcing Party") shall reasonably cooperate in any such litigation at the other party's (the "Enforcing Party") expense; where necessary, the Enforcing Party shall join in, or be named as a necessary party to, such litigation. Neither party shall enter into any settlement of any claim described in Section 4.5(a) or in 4.5(b) that admits to the invalidity or unenforceability of the Joint Rights, incurs any financial liability on the part of the other party, requires an admission of liability, wrongdoing or fault on the part of the other party, each without the other party's prior written consent, such consent not to be unreasonably withheld. The Enforcing Party shall keep the Non-Enforcing Party reasonably informed of the progress of any such enforcement action, and the Non-Enforcing Party shall have the individual right to participate with counsel of its own choice at its own expense. The selection of such counsel will be subject to the Enforcing Party's approval (which shall not be unreasonably withheld). The costs and expenses of the Enforcing Party shall be borne by the Enforcing Party, and any damages, settlements or other monetary awards recovered shall be shared as follows: ~~(i) the amount of such recovery actually received by the Enforcing Party shall first be equally applied to the out-of-pocket costs of both parties in connection with such action; and then (ii) the remainder of the recovery, if any, shall be shared as follows: the Enforcing Party shall retain sixty-six percent (66%) of such recovery, and shall pay the remaining thirty-four percent (34%) to the Non-Enforcing Party.~~ [***].

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

4.6 Defense of Third Party Claims. If either (a) any Antibody or any Product becomes the subject of a third party's claim or assertion of infringement of a patent relating to the manufacture, use, sale, offer for sale or importation of such Antibody or Product, or (b) a declaratory judgment action is brought naming either OMT or Licensee as a defendant and alleging invalidity or unenforceability of any of the Joint Rights, the party first having notice of the claim or assertion shall promptly notify the other party, and they shall both promptly confer to consider the claim or assertion and the appropriate course of action. Unless OMT and Licensee otherwise agree in writing, each shall have the right to defend itself against a suit that names it as a defendant. Neither OMT nor Licensee shall enter into any settlement of any claim described in this Section 4.6 that admits to the invalidity or unenforceability of the Joint Rights, incurs any financial liability on the part of the other, or requires an admission of liability, wrongdoing or fault on the part of the other, without the other's prior written consent, in each case, such consent not to be unreasonably withheld. In any event, OMT and Licensee shall reasonably assist the other and cooperate in any such litigation at the other's request and expense.

4.7 Reservation of Rights. Except for the rights specifically and unambiguously granted in this Agreement, no right or license is granted or implied. Nothing herein shall be construed to limit or restrict, in any manner, OMT's ability to use and exploit, or allow any Person to use or exploit, the Animals and/or any materials derived or developed therefrom (including antibodies or pharmaceutical products) outside the scope of this Agreement. Without limiting the foregoing and notwithstanding anything to the contrary herein, each party understands and agrees that the other party may perform (or may have performed) immunization services for third parties (and/or may allow third parties to perform immunization services) with respect to targets provided or designated by third parties, which may produce (or may have produced) similar or identical antibodies to the Antibodies; the foregoing shall not be deemed a breach of this Agreement.

5. Financial Terms.

5.1 Outlicensing Fees. (a) For each antigen that Licensee uses to generate and license Antibodies to an China Outlicensee, or generate Antibodies on behalf of an China Outlicensee, and for each Existing Antibody that Licensee properly licenses to a China Outlicensee, Licensee shall pay to OMT ~~one million dollars ($1,000,000)~~[***], within thirty (30) days after the Antibody is delivered to and accepted by the applicable China Outlicenseee.

(b) For each Antibody to be licensed to Ex-China Outlicensee, OMT will pay to Licensee ~~forty percent (40%) of any upfront, milestone, royalties or other license~~

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

fees received by OMT[***] (collectively, "OMT License Revenue"), within thirty (30) days after each quarter, under an Ex-China Outlicensing Agreement with such Ex-China Outlicensee.

(c) For each Extra-Territory Outlicense as provided in Section 4.3(b), Licensee will pay to OMT sixty percent (60%) of any upfront, milestone, royalties or other license fees received by License with respect to the Antibodies and product covered by such Extra-Territory Outlicense[***] (collectively, "Extra-Territory License Revenue") within thirty (30) days after each quarter, under an Extra- Territory Outlicensing Agreement.

5.2 Royalty on Net Sales.

(a) Licensee shall pay to OMT a royalty of three percent (3%)[***] of all Net Sales made within China and, only with respect to Products derived from the Existing Antibodies, the China Plus Territory during the applicable Royalty Term for each Product within thirty (30) days after Licensee receives royalty payments from its China Outlicensees. Within sixty (60) days after the end of each calendar quarter (or, with respect to a specific China Outlicensee, the date Licensee actually receives the quarterly report from such China Outlicensee), Licensee shall deliver to OMT, together with the applicable royalty payment due, a detailed written report (in a form reasonably acceptable to OMT) on a country-by-country basis, of Net Sales for such Product for such calendar quarter (if any), including identification of each Selling Party and an itemization of all applicable Permitted Deductions taken. To clarify, Licensee shall make royalty payment to OMT with respect to a Product licensed to a China Outlicensee only after Licensee actually receive royalty payments from such China Outlicensee. For clarity, with respect to disposition of a Product in the China Plus Territory, the royalty obligation in this Section 5.2(a) shall only apply to Products derived from Existing Antibodies; and with regard to the license of other Products in such China Plus Territory, only the financial terms described in Section 5.1(c) above shall apply.

5.3 Method of Payment. All payments due to a party under this Agreement shall be paid in United States Dollars by wire transfer to a bank in the U.S. designated in writing by such party. All references to "dollars" or "$" herein shall refer to United States Dollars. All amounts paid hereunder are non-refundable and non-creditable. Any amount owed by a party to the other party under this Agreement that is not paid within the applicable time period set forth herein shall accrue interest at the lower of (a) one percent (1.0%) per month, or (b) the highest rate permitted under applicable law.

5.4 Records.

(a) Maintenance. Each party shall keep complete and accurate books and records pertaining to its respective Outlicensing Agreements and amounts collected in connection therewith for a period of at least three (3) years after the relevant payment is owed pursuant to this Agreement. The record-keeping obligations and inspection rights in this Section 5.4 shall supplement, and not replace or supersede, any similar rights or obligations hereunder.

(b) Records Examination. Each party (the "Audited Party") shall permit its books and records relating to this Agreement to be examined by an independent third

party auditor who is appointed by the other party (the "Auditing Party") and reasonably acceptable to the Audited Party, provided such auditor shall be subject to written obligations of confidentiality no less protective than the confidentiality and non-use provisions set forth herein. Such inspection may only be conducted upon reasonable notice (no less than ten (10) days in advance thereof), during normal business hours. Such examination is to be made at the expense of the Auditing Party, except in the event that the results of the examination reveal an underpayment by the Audited Party of five percent (5%) or more over the period being examined, in which case the reasonable, out-of-pocket costs and expenses of such examination shall be paid (or reimbursed to the Auditing Party, if such amounts have already been paid by the Auditing Party) by the Audited Party. If the examination establishes that the Audited Party underpaid any amounts due hereunder, the Audited Party shall pay the Audited Party such deficiency within ten (10) days after the Audited Party's receipt of a written report thereof, including interest thereon at the rate set forth in Section 5.3, and, if applicable pursuant to the previous sentence, the costs and expenses of the examination. The results of any such examination shall be the Audited Party's Confidential Information.

5.5 Taxes. Any amounts payable by one party to the other party hereunder are exclusive of any and all applicable sales, use, VAT, GST, excise, property, withholding, and other taxes, levies, duties or fees (collectively, "Taxes"). Each party shall be entitled to deduct the amount of any withholding taxes payable or required to be withheld by it, its affiliates, licensees, or sublicensees (as applicable) to the extent such party, its affiliates, licensees, or sublicensees (as applicable) actually pay such withheld amounts to the appropriate governmental authority on behalf of the other party. Each party shall use commercially reasonable efforts to minimize any such taxes, levies or charges required to be withheld on behalf of the other party. Each party shall promptly deliver to the other party proof of payment of all such taxes, levies and other charges, together with copies of all communications from or with such governmental authority with respect thereto, and shall reasonably cooperate with the other party in seeking any related tax credits that may be available to the other party with respect thereto.

5.6 Currency Exchange. All amounts accruing in a currency other than United States dollars will be expressed in such currency and converted to United States dollars using an exchange rate equal to the conversion rate existing in the United States (as reported in the Wall Street Journal) on the last working day of the applicable calendar quarter for which payment is being made. The conversion calculations will be provided in any statement reporting converted amounts to the other party.

6. Confidentiality.

6.1 Definition. "Confidential Information" means proprietary information, materials, and data of a financial, commercial or technical nature that the disclosing party (the "Disclosing Party") has supplied or otherwise made available to the other party hereunder (the "Receiving Party"). Notwithstanding anything to the contrary, (a) any progeny and the Animal Improvements are the Confidential Information of OMT, deemed disclosed by OMT, and (b) the Antibodies and Products (and information regarding the composition and/or sequences thereof) are the Confidential Information of both parties, deemed disclosed by both parties; and in each case, to which the exceptions in Section 5.3(b) and (d) do not apply.

6.2 Obligations. The Receiving Party shall protect all Confidential Information against unauthorized disclosure to third parties with the same degree of care as the Receiving Party uses for its own similar information, but in no event less than a reasonable degree of care. The Receiving Party shall not use the Confidential Information except as necessary to exercise its rights and fulfill its obligations under this Agreement. The Receiving Party may disclose the Confidential Information only to its respective directors, officers, employees, subcontractors, licensees (including potential licensees), consultants, attorneys, accountants, and banks (collectively, "Recipients"), who have a need-to-know such information in order for Receiving Party to exercise its rights or fulfill its obligations under this Agreement provided that the Receiving Party shall hold all Recipients to written obligations of confidentiality with terms and conditions at least as protective of the Confidential Information as those set forth in this Agreement. Receiving Party shall be liable for any breach of such written obligations or this Section 5 by its Recipients. For clarity, each party may provide a copy of this Agreement with the financial terms redacted to licensees (including potential licensee) if such licensee requires in conducting due diligence for evaluating the related license purpose. For avoidance of doubt, Licensee shall not disclose or make available Animals or any information or materials regarding their composition or engineering to any third party or Recipient (except to (a) its Approved Affiliates, to the sole extent necessary for such Approved Affiliate to exercise its rights pursuant to a sublicense granted to such Affiliate pursuant to Section 4.1, and (b) an Approved Subcontractor, and only then to the sole extent necessary for such Approved Subcontractor to fulfill its obligations pursuant to the applicable Approved Subcontractor Agreement). For clarity, the terms of this Section 6 shall serve to supplement, and not replace, amend, or abate any other restrictions on use and exploitation of the Animals as set forth herein. The terms and existence of this Agreement are Confidential Information of both parties, but each party may disclose the terms and existence of this Agreement to its potential investors and acquirers on a confidential basis in connection with a potential investment or acquisition (as applicable).

6.3 Exceptions. The obligations under this Section 6 shall not apply to any information to the extent the Receiving Party can demonstrate by competent evidence that such information:

(a) is (at the time of disclosure) or becomes (after the time of disclosure) generally known to the public through no breach of this Agreement by the Receiving Party or any Recipients to whom it disclosed such information;

(b) was rightfully known by, or was otherwise in the rightful possession of, the Receiving Party prior to the time of disclosure by the Disclosing Party;

(c) is disclosed to the Receiving Party on a non-confidential basis by a third party who is entitled to disclose it without breaching any confidentiality obligation (directly or indirectly) to the Disclosing Party; or

(d) is independently developed by or on behalf of the Receiving Party, as evidenced by its written records, without use of, reliance upon or access to the Confidential Information.

6.4 Disclosure Pursuant to Law or Order. Receiving Party may disclose Confidential Information that it is required to disclose under applicable laws or a court order, provided that the Receiving Party: (a) provides the Disclosing Party with prompt notice of such disclosure requirement if legally permitted, (b) affords the Disclosing Party an opportunity to oppose or limit, or secure confidential treatment for such required disclosure and (c) if the Disclosing Party is unsuccessful in its efforts pursuant to subsection (b), discloses only that portion of the Confidential Information that the Receiving Party is legally required to disclose.

7. Representations and Warranties; Disclaimer.

7.1 Representations and Warranties of Each Party. Each party represents and warrants to the other party that:

(a) it is a corporation duly organized, validly existing, and in good standing under the laws of its jurisdiction of formation;

(b) it has full corporate power and authority to execute, deliver, and perform under this Agreement, and has taken all corporate action required by applicable law and its organizational documents to authorize the execution and delivery of this Agreement and the consummation of the transactions contemplated by this Agreement;

(c) this Agreement constitutes a valid and binding agreement enforceable against it in accordance with its terms;

(d) all consents, approvals and authorizations from all governmental authorities or other third parties required to be obtained by such party in connection with this Agreement have been obtained;

(e) the execution and delivery of this Agreement and all other instruments and documents required to be executed pursuant to this Agreement, and the consummation of the transactions contemplated hereby, do not and shall not: (i) conflict with or result in a breach of any provision of its organizational documents, (ii) result in a breach of any agreement to which it is a party that would impair the performance of its obligations hereunder; or (iii) violate any applicable law; and

(f) it shall comply with all applicable laws in connection with this Agreement.

7.2 Representations and Warranties of OMT. OMT represents and warrants to Licensee that to OMT's knowledge as of the Effective Date, there are no existing third party rights that would prevent Licensee from making use of the Animals as contemplated herein.

7.3 Disclaimer. EXCEPT AS EXPRESSLY STATED IN THIS SECTION 7, (A) NEITHER OMT NOR ITS LICENSORS MAKES ANY REPRESENTATIONS OR EXTEND ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE, AND THE ANIMALS AND ANYTHING ELSE PROVIDED BY OR ON BEHALF OF OMT PURSUANT TO THIS AGREEMENT ARE

PROVIDED "AS IS," (B) OMT, FOR ITSELF AND ITS LICENSORS, DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND OR NATURE, WHETHER EXPRESS OR IMPLIED, RELATING TO THE SUBJECT MATTER HEREUNDER, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, TITLE, FITNESS FOR A PARTICULAR PURPOSE, AND NON- INFRINGEMENT.

8. Indemnification.

8.1 Indemnification of Licensee. Subject to Section 8.3 below, OMT agrees to indemnify, hold harmless and defend Licensee, its affiliates, directors, officers, licensors, employees and agents (each a "Licensee Indemnitee") from and against any and all losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees and expenses) (collectively, "Losses") payable to unaffiliated third parties, incurred by Licensee Indemnitees in connection with any and all suits, investigations, claims or demands of a third party (collectively, "Third Party Claims") to the extent arising from (a) any alleged infringement or misappropriation of such third party's intellectual property rights arising from or occurring as a result of the use by Licensee or any Outlicensee of Animals to generate Antibodies or (b) the production, use, marketing, or sale of Antibodies or Products by an Ex-China Outlicensee (or its licensees). Notwithstanding anything to the contrary herein, in no event shall OMT be obligated to indemnify Licensee Indemnitees for any Third Party Claims to the extent such Third Party Claims (i) would be subject to indemnification by Licensee pursuant to Section 8.2, or (ii) arise in connection with any modifications of the Animals, or any combination of the Animals with any other material or organism, in each case not made by OMT, or (iii) arising in connection with any use of the Animals that is not strictly in accordance with this Agreement.

8.2 Indemnification of OMT. Subject to Section 8.3 below, Licensee agrees to indemnify, hold harmless and defend OMT, its affiliates, directors, officers, licensors, employees and agents (each an "OMT Indemnitee") from and against all Losses incurred by OMT Indemnitees in connection with any and all Third Party Claims to the extent arising from (a) the production, use, marketing, or sale of Antibodies or Products by Licensee or any China Outlicensee or Extra-Territory Licensee (or either of their licensees), and (b) the use of any Animals that is not strictly in accordance with this Agreement.

8.3 Indemnification Procedure. All indemnification claims provided for in Sections 7.1 and 7.2 shall be made solely by such party to this Agreement seeking indemnification hereunder (the "Indemnified Party"). The Indemnified Party shall promptly notify the indemnifying party (the "Indemnifying Party") of any Third Party Claim. The Indemnified Party shall cooperate with the Indemnifying Party, at the Indemnifying Party's expense, in connection with the defense and settlement of the Third Party Claim, and permit the Indemnifying Party to solely control the defense and settlement of the Third Party Claim.

9. Term and Termination.

9.1 Term. The term of this Agreement shall commence on the Effective Date and shall continue indefinitely, unless earlier terminated as provided herein (the "Term").

9.2 Termination for Breach. Either party may terminate this Agreement upon a material breach of this Agreement by the other party by providing fifteen (15) days prior written notice to the other party. The termination shall become effective at the end of the notice period unless the breaching party cures such breach during such notice period. Notwithstanding the foregoing, if the breach, by its nature, is incurable, the non-breaching party may terminate this Agreement immediately upon written notice to the breaching party.

9.3 Termination for Convenience. Licensee may terminate this Agreement at any time for convenience by providing OMT thirty (30) days prior written notice.

9.4 Termination for IP Challenge. To the fullest extent allowed by applicable law, OMT shall have the right, upon written notice to Licensee, to terminate in full (a) this Agreement, in the event that Licensee directly challenges in any legal or administrative proceeding the patentability, enforceability, or validity of any of OMT's intellectual property rights covering the Animals, or (b) any China Outlicensee's China Outlicensing Agreement, in the event that such China Outlicensee directly challenges in any legal or administrative proceeding the patentability, enforceability, or validity of any of OMT's intellectual property rights covering the Animals; provided that OMT shall have no right to terminate any China Outlicensing Agreement under this Section 9.4 for any challenge by a China Outlicensee if such challenge is dismissed within sixty (60) days of OMT's notice to Licensee under this Section 9.4 and not thereafter continued.

9.5 Effect of Expiration or Termination.

(a) Upon termination or expiration of this Agreement or any reason, any right to use or exploit the Animals in any manner whatsoever (including its ability to place Orders in accordance with Section 3.1) shall immediately terminate, provided that all other terms shall survive.

(b) Upon termination or expiration of this Agreement, each Receiving Party shall return to the other party or properly destroy (and certify destruction of) all Confidential Information of the other party, including any extracts, notes, modifications, or derivatives thereof; the foregoing shall include, without limitation, Licensee's return to OMT, or destruction of, any and all Animals and embodiments of either of them, including derivatives thereof, and any modifications and/or analogs thereof (excluding Antibodies and Products).

10. Limitation of Liability. To the fullest extent allowed by applicable law, except for breaches of Section 6 and for each party's indemnification obligations under Section 8, in no event shall either party or its directors, officers, employees, consultants and agents (collectively, its "Agents"), be responsible or liable in connection with this Agreement for any indirect, special, punitive, incidental or consequential damages or lost profits to the other party or its licensees or Agents, regardless of legal theory. The above limitations on liability apply even though a party may have been advised of the possibility of such damage. Licensee shall not, and shall require that its licensees do not, make any statements, representations or warranties or accept any liabilities or responsibilities whatsoever on behalf of OMT or its Agents and with regard to any person or entity that are inconsistent with any disclaimer or limitation in Section 7.3 or this Section 10.

11. General Provisions.

11.1 Relationship of the Parties. The parties to this Agreement recognize and agree that each is operating as an independent contractor and not as an agent of the other. This Agreement shall not constitute a partnership or joint venture, and neither party shall be bound by the other to any contract, arrangement or understanding except as specifically stated herein.

11.2 Assignment. This Agreement is not assignable or transferable by either party (by operation of law or otherwise), without the prior written consent of the other party, provided that either party may assign this Agreement to a successor to all or substantially all of such party's assets or business to which this Agreement relates.

11.3 Notices. Any notice, report, approval or consent required or permitted hereunder shall be in writing and shall be deemed to have been duly given to a party if delivered personally or mailed by first-class, registered or certified mail, postage prepaid to the address of that party as set forth on the first page of this Agreement; or such other address as is provided by that party to the other upon ten (10) days written notice.

11.4 Force Majeure. Except for payment obligations, a party shall not be held liable or responsible to the other party or be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any term of this Agreement when such failure or delay is caused by or results from events beyond the reasonable control of the non-performing party, including fires, floods, embargoes, shortages, epidemics, quarantines, war, acts of war (whether war be declared or not), acts of terrorism, insurrections, riots, civil commotion or acts of God. The non-performing party shall provide reasonable notice of any force majeure event to the other party.

11.5 Waiver. No failure to exercise, and no delay in exercising, on the part of either party, any privilege, power, or right hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any privilege, right or power hereunder preclude further exercise of any other privilege, right or power hereunder. Any waivers or amendments shall be effective only if made in writing and signed by authorized representatives of the parties.

11.6 Severability. If any provision of this Agreement shall be adjudged by any court of competent jurisdiction to be unenforceable or invalid, that provision shall be limited or

eliminated to the minimum extent necessary so that this Agreement shall otherwise remain in full force and effect and enforceable.

11.7 Governing Law; Arbitration. This Agreement shall be governed by and construed pursuant to the laws of the State of California without regard to conflicts of laws provisions thereof and without regard to the United Nations Convention on Contracts for the International Sale of Goods. All disputes hereunder shall be submitted to binding arbitration using the English language (with all documents produced or submitted in connection therewith required to be in English) in accordance with the Comprehensive Arbitration Rules and Procedures of Judicial Arbitration and Mediation Services, Inc. ("JAMS") then in effect (the "Rules"), by one or more commercial arbitrator(s) with substantial experience in resolving complex commercial contract and intellectual property disputes, who will be selected from the appropriate list of JAMS arbitrators in accordance with the Rules. The arbitration will be held in New York, New York. For all purposes of this Agreement, the Parties hereby submit to the exclusive jurisdiction of the state and federal courts located in San Francisco County, California, provided that notwithstanding anything in this Section 11.7, either party may pursue injunctive or other equitable relief at any time in any court of competent jurisdiction. In any action or proceeding to enforce rights under this Agreement, the prevailing party shall be entitled to recover its reasonable costs and attorneys' fees.

11.8 Publicity. Neither party shall, without the prior written consent of the other party, issue any press release or make any other public announcement concerning the existence of this Agreement or its terms and conditions, or otherwise use the other party's name(s), mark(s), and/or logo(s), such consent not to be unreasonably withheld.

11.9 Equitable Relief. The parties acknowledge that money damages alone would not adequately compensate a party in the event of a breach by the other party of this Agreement (including, without limitation, any unauthorized use of the Animals) and that, in addition to all other remedies available to a party at law or in equity, it shall be entitled to seek equitable relief (including injunction and specific performance) for the enforcement of its rights hereunder, without the requirement of posting a bond.

11.10 Entire Agreement. This Agreement is the complete and exclusive statement of the agreement and understanding of the parties and supersedes and cancels all previous written and oral agreements, understandings and communications relating to the subject matter of this Agreement, including, as provided in Section 2 hereof, the Development and Commercialization Agreement by and between the parties dated August 20, 2012, and the Strategic Commercial Partner Agreement by and between the parties dated February 22, 2013. No amendment or change hereof or addition hereto shall be effective or binding on either of the parties hereto unless reduced to writing and duly executed on behalf of both parties.

11.11 Approval. Unless otherwise expressly provided herein, anything subject to OMT's approval herein is subject to such approval in OMT's sole discretion.

11.12 Headings. The headings to the sections in this Agreement are not a part of this Agreement, but are included merely for convenience of reference only and shall not affect its

meaning or interpretation. Any use of the term "including" shall mean "including without limitation."

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed so as to be effective on the date set forth above.

Open Monoclonal Technology, Inc.	WuXi AppTec Biopharmaceuticals Co., Ltd.
By: /s/ Roland Buelow	By: /s/ Chris Chen
Name: Roland Buelow	Name: Chris Chen
Title: CEO	Title: SVP & CTO

Exhibit A

Housing and Maintenance Provisions

Federal guidelines for use of vertebrate animals in research contain specific provisions for basic husbandry. Proper diet and a stress-free, sanitary environment are some of the greatest tools in preventing the development or transmission of disease. Animals must be housed in accordance with the guidelines set forth in the Guide for the Care and Use of Laboratory Animals, currently available at http://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf (the "Guidelines"), which are adapted from the requirements of the Animal Welfare Act and may be updated from time to time.

Exhibit B

Approved Affiliates Approved Facilities; Approved Subcontractors

Approved Affiliates:

WuXi AppTec (Shanghai) Co., Ltd. (In Chinese: 上海药明康德新药开发有限公司)

WuXi Biologics (Shanghai) Co. Ltd. (In Chinese: 上海药明生物技术有限公司)

Approved facilities of Licensee:

108 Meiliang Rd, Wuxi city, PRC

288 FuTe Middle Rd, Shanghai PRC

Approved facilities of, and scope of work for, Approved Subcontractors:

108 Meiliang Rd, Wuxi city, PRC

288 FuTe Middle Rd, Shanghai PRC

Summary report: Litéra® Change-Pro TDC 10.1.0.400 Document comparison done on 8/7/2018 11:48:08 AM	
Style name: L&W with Moves	
Intelligent Table Comparison: Active	
Original DMS: iw://US-DOCS/US-DOCS/102810577/1	
Modified DMS: iw://US-DOCS/US-DOCS/102810577/2	
Changes:	
Add	19
~~Delete~~	9
~~Move From~~	0
Move To	0
Table Insert	0
~~Table Delete~~	0
Table moves to	0
~~Table moves from~~	0
Embedded Graphics (Visio, ChemDraw, Images etc.)	0
Embedded Excel	0
Format changes	0
Total Changes:	28

Exhibit 10.14

***Text Omitted and Filed Separately with the Securities and Exchange Commission. Confidential Treatment Requested Under 17 C.F.R. Sections 200.80(b)(4) and 240.24b-2.

AMENDMENT NUMBER ONE TO PLATFORM LICENSE AGREEMENT

This Amendment Number One to Platform License Agreement (this "Amendment No. 1") is made by and between OMT, Inc. ("OMT"), which has its principal place of business at 3911 Sorrento Valley Boulevard, Suite 110, San Diego, California 92121, U.S.A., and WuXi Biologics (Hong Kong) Limited ("Licensee"), which has its principal place of business at Suite 3701-10, 37F., Jardine Hse, 1 Connaught Place, Central, Hong Kong. OMT and Licensee may each be referred to herein as a "Party" and collectively as the "Parties."

WHEREAS, OMT and WuXi AppTec Biopharmaceuticals Co., Ltd. ("WuXi"), which has its principal place of business at 108 Meiliang Rd., Mashan, Wuxi, P.R. China, entered into the Platform License Agreement, effective on March 23, 2015 (the "Agreement");

WHEREAS, pursuant to the Assignment and Assumption Agreement entered by and among the Parties and WuXi as of July 19, 2016, WuXi assigned the Agreement to Licensee; and

WHEREAS, the Parties desire to amend certain terms of the Agreement in accordance with this Amendment No. 1, and this Amendment No. 1 shall be effective as of June 11, 2017 (the "Amendment No. 1 Effective Date").

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by the Parties, the Parties, intending to be legally bound, agree as follows:

1. All capitalized terms used in this Amendment No. 1 and not otherwise defined in this Amendment No. 1 shall have the meanings assigned to such terms in the Agreement.

2. Section 1.8 of the Agreement shall be deleted in its entirety and replaced with the following:

> "China Outlicensee" means a third party that executes a China Outlicensing Agreement in accordance with Section 4.3(a) and that is authorized, including without limitation under a license or option grant and/or an appointment as distributor, under such China Outlicensing Agreement to use, develop, market, distribute, offer for sale, and/or sell an Antibody in China, and, upon execution and delivery of a China Plus Addendum, in the applicable China Plus Territory."

3. Section 1.10 of the Agreement shall be deleted in its entirety and replaced with the following:

> "Net Sales" means the gross amounts invoiced by or for Licensee and/or any Outlicensee, as applicable, (each, a "Selling Party") for the

disposition of a unit of Product to a third party end user (the "Gross Sales Price"), after deduction (if not already deducted in the amount invoiced) of the following expenses paid by the Selling Party for such Product that are each actually incurred and itemized on such invoice by the Selling Party: (i) freight, shipping, transportation and insurance costs; (ii) discounts, in reasonable amounts that are customary in the trade, that are actually given to buying groups, health care insurance carriers, chain pharmacies, mass merchandisers, staff model HMOs, pharmacy benefit managers, and other similar wholesalers and distributors, for quantity purchases and prompt payment; (iii) tax, including sales, use, turnover, excise, import and other taxes, customs or duties borne by the Selling Party imposed by a governmental agency on such disposition, and (iv) credits or allowances actually given or made with respect to a Product by reason of rejection, defects, recalls, returns, rebates, or uncollectable amounts ((i)-(iv) together, "Permitted Deductions"). A Selling Party shall not dispose of any Product for any consideration other than monetary consideration and on bona fide arm's length terms, without the prior written agreement of OMT and Licensee (that describes in reasonable detail the basis for calculation of Net Sales based on such a transaction)."

4. Section 1.17 of the Agreement shall be deleted in its entirety and replaced with the following:

> "Outlicensing Agreements" means China Outlicensing Agreements, Ex-China Outlicensing Agreements, and Territory Outlicensing Agreements."

5. Section 1.18 of the Agreement shall be deleted in its entirety and replaced with the following:

> "Outlicensee(s)" means a China Outlicensee(s), Ex-China Outlicensee(s), and/or Territory Outlicensee(s)."

6. Section 1.20 of the Agreement shall be deleted in its entirety and replaced with the following:

> "Territory" means worldwide."

7. A new Section 1.21 shall be added to the Agreement as follows:

> "1.21 Ex-China Outlicensee" means a third party that executes an Ex-China Outlicensing Agreement in accordance with Section 4.3(b) and that is authorized, including without limitation under a license or option grant and/or an appointment as distributor, under such Ex-China Outlicensing Agreement to use, develop, market, distribute, offer for sale, and/or sell an Antibody outside of China (excluding any China Plus

Territory to the extent rights to such Antibody have been granted to a Third Party other than such Ex-China Outlicensee)."

8. A new Section 1.22 shall be added to the Agreement as follows:

"1.22 Territory Outlicensee" means a third party that executes a Territory Outlicensing Agreement in accordance with Section 4.3(c) and that is authorized, including without limitation under a license or option grant and/or an appointment as distributor, under such Territory Outlicensing Agreement to use, develop, market, distribute, offer for sale, and/or sell an Antibody both in China and outside of China and the China Plus Territory."

9. Section 4.2 of the Agreement shall be deleted in its entirety and replaced with the following:

"(a) OMT and Licensee jointly own the Antibodies and any Products (including Products developed by an Outlicensee) and all intellectual property rights therein, including any patent rights (collectively, "Joint Rights"), and each hereby makes (and will cause each of their respective Outlicensees to make, and, with respect to Licensee, will cause Approved Affiliates and its and their Approved Subcontractors to make) all assignments necessary to achieve the foregoing. Subject to compliance with all terms and conditions of this Agreement, OMT and Licensee hereby grant the other a non-exclusive, irrevocable, perpetual, worldwide, royalty-free, non-transferable (except in accordance with Section 11.2) right and license in and to the Joint Rights, in each case to the extent necessary to achieve such joint ownership and allow each party to exercise its rights hereunder. Each of OMT and Licensee shall, at the request of the other, execute all documents and do all other acts and things as may be reasonably required in order to vest fully and effectively in both OMT and Licensee, jointly, all rights in and to such Joint Rights.

(b) Licensee shall have the right to file, prosecute, and maintain all patent rights in the Territory with respect to the Joint Rights ("Joint Patent Rights"), provided that Licensee may do the foregoing in an Outlicensee's name, provided such Outlicensee is at all times in compliance with the obligations of its Outlicensing Agreement. Licensee shall use (or, if applicable pursuant to the previous sentence, cause its Outlicensee to use) commercially reasonable efforts to so file, prosecute, and maintain such Joint Patent Rights. Licensee shall, at least fourteen (14) days prior to submission or within fourteen (14) days of receipt (as applicable), forward to OMT copies of any significant office actions, communications, and correspondence relating to the Joint Patent Rights (including any correspondence of applicable Outlicensees). OMT shall have the right to comment on and to discuss such prosecution and

maintenance activities with Licensee, and Licensee shall consider (and cause the applicable Outlicensees to consider) OMT's comments in good faith."

10. Section 4.3 of the Agreement shall be deleted in its entirety and replaced with the following:

"Outlicensing.

(a) China Outlicensing Agreement. Licensee may authorize, including without limitation under a license or option grant and/or an appointment as distributor, a third party to use, develop, market, distribute, offer for sale, and/or sell an Antibody in China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) solely pursuant to an agreement that is consistent with the terms and conditions of this Agreement, including without limitation this Section 4.3(a), below (each such third party agreement, a "China Outlicensing Agreement"). Pursuant to a China Outlicensing Agreement, Licensee may distribute or otherwise transfer any Antibodies generated by or on behalf of Licensee to the applicable China Outlicensee using antigens selected by Licensee or such China Outlicensee. Licensee shall be responsible and liable for all actions and omissions of China Outlicensees in connection with such Antibodies. Licensee may provide any such resulting Antibodies to a China Outlicensee that is bound by a China Outlicensing Agreement. Additionally, Licensee may provide Existing Antibodies to a China Outlicensee that is bound by a written addendum to such China Outlicensing Agreement for use, development, and marketing in the China Plus Territory (a "China Plus Addendum," which shall be deemed a part of the applicable China Outlicensing Agreement). Each China Outlicensing Agreement will include payment provisions that enable Licensee to comply with its obligations to make payments to OMT under this Agreement, and will prohibit the licensing, distribution, sale, offer for sale, use, or other transfer of any Antibody or Product outside of China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) by or on behalf of the applicable China Outlicensee, and shall not grant any exclusive license of any Antibody (except solely for use within China (and, as applicable with respect to Existing Antibodies, the China Plus Territory), where "use" includes development of and distribution of Products) without the prior written consent of OMT, except in each case to the extent such China Outlicensee is also an Ex-China Outlicensee with respect to the same Antibody or Product.

(b) Ex-China Outlicensing Agreement. Licensee may authorize, including without limitation under a license or option grant and/or an appointment as distributor, a third party to use, develop, market, distribute, offer for sale, and/or sell an Antibody outside of China (and, as

applicable with respect to Existing Antibodies, the China Plus Territory) solely pursuant to an agreement that is consistent with the terms and conditions of this Agreement, including without limitation this Section 4.3(b), below (each such third party agreement, a "Ex-China Outlicensing Agreement"). Pursuant to an Ex-China Outlicensing Agreement, Licensee may distribute or otherwise transfer any Antibodies generated by or on behalf of Licensee to the applicable Ex-China Outlicensee using antigens selected by Licensee or such Ex-China Outlicensee. Licensee shall be responsible and liable for all actions and omissions of Ex-China Outlicensees in connection with such Antibodies. Each Ex-China Outlicensing Agreement will prohibit the licensing, distribution, sale, offer for sale, use, or other transfer of any Antibody or Product in and/or into China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) by or on behalf of the applicable Ex-China Outlicensee, and shall not grant any exclusive license of any Antibody (except solely for use outside China (and, as applicable with respect to Existing Antibodies, the China Plus Territory), where "use" includes development of and distribution of Products) without the prior written consent of Licensee, except in each case to the extent such Ex-China Outlicensee is also a China Outlicensee with respect to the same Antibody or Product.

(c) Territory Outlicensing Agreement. Licensee may authorize, including without limitation under a license or option grant and/or an appointment as distributor, a third party to use, develop, market, distribute, offer for sale, and/or sell an Antibody both in China and outside of China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) solely pursuant to an agreement that is consistent with the terms and conditions of this Agreement, including without limitation this Section 4.3(c), below (each such third party agreement, a "Territory Outlicensing Agreement"). Pursuant to a Territory Outlicensing Agreement, Licensee may distribute or otherwise transfer any Antibodies generated by or on behalf of Licensee to the applicable Territory Outlicensee using antigens selected by Licensee or such Territory Outlicensee. Licensee shall be responsible and liable for all actions and omissions of Territory Outlicensees in connection with such Antibodies.

(d) Licensee may not outlicense or otherwise provide rights in any Antibodies to any third party except for China Outlicensees pursuant to Section 4.3(a), Ex-China Outlicensees pursuant to Section 4.3(b), and/or Territory Outlicensees pursuant to Section 4.3(c).

(e) Licensee shall make commercially reasonable efforts to and in good faith market and outlicense the Antibody; provided that, if Licensee does not outlicense any Antibody in accordance with the terms and conditions of Sections 4.3(a), (b), and (c) after using commercially reasonable efforts to do so, Licensee shall have the right to market and sell

such Antibody directly and/or through subcontractors, provided that the terms and conditions of Sections 4.3(a), (b), and (c) shall apply to Licensee mutatis mutandis as if Licensee were the applicable outlicensee. Notwithstanding the foregoing, if, within three (3) years after OMT and Licensee's filing of a patent application claiming an Antibody's sequence, an Ex-China Outlicensing Agreement or a Territory Outlicensing Agreement for such Antibody has not been executed, then OMT may seek to license the Antibody under an Ex-China Outlicensing Agreement or Territory Outlicensing Agreement subject to Licensee's approval of any such Ex-China Outlicensing Agreement or Territory Outlicensing Agreement. Such approval by Licensee must not be unreasonably withheld, delayed, or conditioned. It will not be deemed unreasonable for Licensee to withhold its approval if such Ex-China Outlicensing Agreement or Territory Outlicensing Agreement does not contain terms that would have the potential to provide Licensee a fair and reasonable return on its investment after taking into account payments made to OMT under Section 5.

(f) Each Outlicensing Agreement shall contain terms no less protective of OMT (including without limitation its intellectual property rights in the Animals, Antibodies, and Products) than those set forth herein. Each Outlicensing Agreement shall refer to this Agreement and shall be subordinate to and consistent with the terms and conditions of this Agreement, and shall not limit the ability of Licensee (individually or through the activities of its Outlicensee) to fully perform all of its obligations under this Agreement or OMT's rights under this Agreement. Licensee shall require each Outlicensee to agree in writing to be bound by all of the applicable terms and conditions of this Agreement. Licensee shall remain responsible for the performance of this Agreement and the performance of its Outlicensees under this Agreement, including without limitation the payment of all payments due, and making reports and keeping books and records, and shall cause such Outlicensee to enable Licensee to comply with the terms and conditions of this Agreement. Licensee shall remain jointly and severally liable for any uncured breach of an Outlicensing Agreement by a Outlicensee to the extent that such uncured breach would constitute a breach of this Agreement. Licensee will use good faith efforts to enforce, including without limitation through initiation and prosecution of legal action, the terms of any Outlicensing Agreement in the event the applicable Outlicensee is in breach of such Outlicensing Agreement. Each Outlicensing Agreement shall terminate immediately upon the termination of this Agreement (in whole or only with respect to the rights that are subject to such Outlicensing Agreement). Licensee will keep OMT reasonably informed of the status of any Outlicensing Agreements, and promptly after execution of the Outlicensing Agreement, Licensee shall provide a summary of such Outlicensing Agreement to OMT."

11. Section 4.4 of the Agreement shall be deleted in its entirety and replaced with the following:

> "As between the parties, and without limiting any other available remedy, OMT owns (i) the Animals and (ii) any modification, improvement, enhancement, or progeny of the Animals created in violation of Section 3.14.1(a) above or antibodies created in violation of the same Section, and (iii) any Antibodies or Products distributed outside of China in violation of Section 4.3(a) above ((ii) and (iii) collectively, "Animal Improvements"), and all intellectual property rights in any of the foregoing; Licensee hereby makes (and will cause its Approved Affiliates and its and their Approved Subcontractors, and any Outlicensee, as applicable, to make) all assignments necessary to accomplish the foregoing ownership with respect to any Animal Improvements and progeny. Licensee acknowledges and agrees that the Animals, together with any related biological material or substance that is replicated, synthesized or in any way derived from the Animals (including progeny), except for Antibodies, include and constitute valuable trade secrets of OMT, and OMT has used diligent efforts to maintain such items as its trade secrets and Confidential Information."

12. Section 4.5(a) of the Agreement shall be deleted in its entirety and replaced with the following:

> "Each of OMT and Licensee shall notify the other promptly in writing when each learns of or reasonably suspects infringement of any Joint Right by a third party (an "Infringement"). Licensee, or its Outlicensee, shall have the first right to enforce any Joint Right in the Territory, and control, defend and settle such suit in a manner consistent with the terms and provisions hereof, and recover any damages, awards or settlements resulting therefrom, subject to Section 4.5(c)."

13. Section 5.1 of the Agreement shall be deleted in its entirety and replaced with the following:

> "Outlicensing Fees.
>
> (a) China Outlicensing Agreements. For each antigen that Licensee uses to generate and license Antibodies to a China Outlicensee, or generate Antibodies on behalf of a China Outlicensee, and for each Existing Antibody that is subject to a China Outlicensing Agreement, Licensee shall pay to OMT ~~one million dollars ($1,000,000)~~[***], within

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

thirty (30) days after the Antibody is delivered to and accepted by such China Outlicensee. If a China Outlicensee is also an Ex-China Outlicensee pursuant to an Ex-China Outlicensing Agreement, then the ~~$1,000,000~~[***] payment set forth in the preceding sentence with respect to a specific Antibody shall be creditable against the applicable 'Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee' payment subsequently payable under Section 5.1(b)(i) or (ii) for such Ex-China Outlicensing Agreement with respect to such Antibody, or, if Licensee has previously paid to OMT such 'Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee' payment payable under Section 5.1(b)(i) or (ii) for such Ex-China Outlicensing Agreement with respect to a specific Antibody, then Licensee shall not be required to pay to OMT the ~~$1,000,000~~[***] payment set forth in the preceding sentence with respect to such Antibody.

(b) Ex-China Outlicensing Agreements. Each Ex-China Outlicensing Agreement shall provide that any milestones and royalties shall be paid to Licensee. Licensee will pay OMT the following payments per each Antibody that is subject to such Ex-China Outlicensing Agreement:

(i) For each Ex-China Outlicensing Agreement* that Licensee enters into prior to entering into the third Outlicensing Agreement that is an Ex-China Outlicensing Agreement or a Territory Licensing Agreement:

~~Execution of such Ex-China Outlicensing Agreement~~	~~$1,000,000~~
~~Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee~~	~~$2,000,000**~~
~~Initiation of the first Phase 2 Trial for each Antibody that is subject to such Ex-China Outlicensing Agreement~~	~~$2,000,000~~
~~Acceptance of a Regulatory Approval Application for each Antibody that is subject to such Ex-China Outlicensing Agreement~~	~~$5,000,000~~
~~Approval of a Regulatory Approval Application for each Antibody that is subject to such Ex-China Outlicensing Agreement~~	~~$3,000,000~~

[***]

* For clarity, the payments in the table above shall be multiplied by the number of Antibodies that are subject to such Ex-China Outlicensing Agreement.

~~** If the Ex-China Outlicensee is also a China Outlicensee pursuant to a China Outlicensing Agreement and Licensee has paid to OMT, as a result of entering into such China Outlicensing Agreement, the~~

~~$1,000,000 payment pursuant to the first sentence of Section 5.1(a) with respect to a specific Antibody, then such $1,000,000 payment shall be creditable against the $2,000,000 'Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee' payment payable under this Section 5.1(b)(i) for such Ex-China Outlicensing Agreement with respect to such Antibody. Additionally, if Licensee has previously entered into one or more Territory Outlicensing Agreements and has paid to OMT, for each such Territory Outlicensing Agreement, the $2,000,000 milestone payment(s) for the 'Delivery of Antibodies Production Cell-Line to the Territory Outlicensee' milestone under Section 5.1(c)(i), then the $2,000,000 'Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee' payment payable under this Section 5.1(c)(i) shall be reduced to $1,000,000 for each such Territory Outlicensing Agreement entered into.~~

[***]

(ii) For each Ex-China Outlicensing Agreement* that Licensee enters into after entering into the second Outlicensing Agreement that is an Ex-China Outlicensing Agreement or a Territory Licensing Agreement:

Execution of such Ex-China Outlicensing Agreement	$1,000,000
Delivery of Antibodies Production Cell-Line to the Ex-China Outlicensee	$1,000,000**
Initiation of the first Phase 1 Trial for each Antibody that is subject to such Ex-China Outlicensing Agreement	$1,000,000
Initiation of the first Phase 2 Trial for each Antibody that is subject to such Ex-China Outlicensing Agreement	$2,000,000
Acceptance of a Regulatory Approval Application for each Antibody that is subject to such Ex-China Outlicensing Agreement	$5,000,000
Approval of a Regulatory Approval Application for each Antibody that is subject to such Ex-China Outlicensing Agreement	$3,000,000

[***]

* For clarity, the payments in the table above shall be multiplied by the number of Antibodies that are subject to such Ex-China Outlicensing Agreement.

** If the Ex-China Outlicensee is also a China Outlicensee pursuant to a China Outlicensing Agreement and Licensee has paid to OMT, as a result of entering into such China Outlicensing Agreement, the $1,000,000 payment pursuant to the first sentence of Section 5.1(a) with respect to a specific Antibody, then such $1,000,000 payment shall be creditable against the $1,000,000 'Delivery of Antibodies Production Cell-Line to Ex-China Outlicensee' payment payable under this Section 5.1(b)(i) for such Ex-China Outlicensing Agreement with respect to such Antibody.

[***]

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

(iii) Notwithstanding anything to the contrary in Section 5.1(b)(i) and (ii), if any Ex-China Outlicensing Agreement does not include the grant of any rights outside of Brazil, Russia, India, Korea, Indonesia, Thailand, Philippines, Malaysia, Singapore, Vietnam, Myanmar, Cambodia, Laos, and Brunei, as evidenced by a signed copy of the agreement with Licensee covering such country(ies), then the payments payable to OMT pursuant to this Section 5.1(b) with respect to such Ex-China Outlicensing Agreement shall be the amount equal to ~~forty percent (40%) of the payments received by Licensee under such Ex-China Outlicensing Agreement~~[***].

(c) Territory Outlicensing Agreements. Each Territory Outlicensing Agreement shall provide that any milestones and royalties shall be paid to Licensee. Licensee will pay OMT the following payments per each Antibody that is subject to such Territory Outlicensing Agreement:

(i) For each Territory Outlicensing Agreement* that Licensee enters into prior to entering into the third Outlicensing Agreement that is an Ex-China Outlicensing Agreement or a Territory Licensing Agreement:

~~Execution of such Territory Outlicensing Agreement~~	~~$1,000,000~~
~~Delivery of Antibodies Production Cell-Line to the Territory Outlicensee~~	~~$2,000,000~~
~~Initiation of the first Phase 2 Trial for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$2,000,000~~
~~Acceptance of a Regulatory Approval Application for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$5,000,000~~
~~Approval of a Regulatory Approval Application for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$3,000,000~~

[***]

* For clarity, the payments in the table above shall be multiplied by the number of Antibodies that are subject to such Territory Outlicensing Agreement.

(ii) For each Territory Outlicensing Agreement* that Licensee enters into after entering into the second Outlicensing Agreement that is an Ex-China Outlicensing Agreement or a Territory Licensing Agreement:

~~Execution of such Territory Outlicensing Agreement~~	~~$1,000,000~~
~~Delivery of Antibodies Production Cell-Line to the Territory Outlicensee~~	~~$1,000,000~~
~~Initiation of the first Phase 1 Trial for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$1,000,000~~
~~Initiation of the first Phase 2 Trial for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$2,000,000~~
~~Acceptance of a Regulatory Approval Application for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$5,000,000~~
~~Approval of a Regulatory Approval Application for each Antibody that is subject to such Territory Outlicensing Agreement~~	~~$3,000,000~~

[***]

* For clarity, the payments in the table above shall be multiplied by the number of Antibodies that are subject to such Territory Outlicensing Agreement."

14. Section 5.2 of the Agreement shall be deleted in its entirety and replaced with the following:

"(a) For any Product that is sold by or on behalf of Licensee in China or by or on behalf of a China Outlicensee (that is including any China Plus Territory for Existing Antibodies), Licensee shall pay to OMT a royalty of ~~three percent (3%)~~[***] of all Net Sales of such Product made by or on behalf of Licensee in China or by or on behalf of such China Outlicensee during the applicable Royalty Term for such Product.

(b) For any Product that is sold by or on behalf of Licensee outside of China or by or on behalf of an ex-China Outlicensee, Licensee

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

shall pay to OMT a royalty of: (i) ~~three percent (3%)~~[***] of all worldwide Net Sales of such Product made by or on behalf of Licensee outside of China or by or on behalf of such ex-China Outlicensee that are less than or equal to ~~$2 Billion~~[***] U.S. dollars in each Calendar Year, and (ii) ~~four percent (4%)~~[***] of all worldwide Net Sales of such Product made by or on behalf of Licensee outside of China or by or on behalf of such ex-China Outlicensee that are greater than ~~$2 Billion~~[***] U.S. dollars in each Calendar Year; in each of (i) and (ii), during the applicable Royalty Term for such Product. For purposes of this Agreement, "Calendar Year" means each year commencing on January 1st and ending on December 31st.

(c) For any Product that is sold by or on behalf of a Territory Outlicensee, Licensee shall pay to OMT a royalty of: (i) ~~three percent (3%)~~[***] of all Net Sales of such Product made by or on behalf of such Territory Outlicensee in China; and (ii) (A) ~~three percent (3%)~~[***] of all worldwide Net Sales of such Product made by or on behalf of such Territory Outlicensee outside of China that are less than or equal to ~~$2 Billion~~[***] U.S. dollars in each Calendar Year, and (B) ~~four percent (4%)~~[***] of all worldwide Net Sales of such Product made by or on behalf of such Territory Outlicensee outside of China that are greater than ~~$2 Billion~~ [***] U.S. dollars in each Calendar Year; in each of (i) and (ii), during the applicable Royalty Term for such Product.

(d) Within sixty (60) days after the end of each calendar quarter, Licensee shall deliver to OMT, together with the applicable royalty payment due under Sections 5.2(a) and (b), a detailed written report (in a form reasonably acceptable to OMT) on a country-by-country basis, of Net Sales for such Product for such calendar quarter (if any), including identification of each Selling Party and an itemization of all applicable Permitted Deductions taken; provided that, if Licensee has not received royalties on such sales made during such calendar quarter by any Outlicensee, Licensee shall be permitted to delay its payment obligation to OMT under this Section 5.2(d), above, solely with respect to such sales made by such Outlicensee to the date that is not later than sixty (60) days after the end of the calendar quarter in which Licensee received such royalties from such Outlicensee; provided, further, that if such payment deadline is extended by three (3) calendar quarters, then Licensee shall be obligated to pay, within sixty (60) days after the end of such third (3rd) calendar quarter, the royalties that are payable under Sections 5.2(a) and

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

(b) based on such sales by such Outlicensee regardless of whether Licensee has received royalties on such sales from such Outlicensee. In addition, within twenty-five (25) days after the end of each calendar quarter, Licensee will deliver to OMT a preliminary report documenting the estimated total sales of all Products during such calendar quarter."

15. Section 8.1 of the Agreement shall be deleted in its entirety and replaced with the following:

"Indemnification of Licensee. Subject to Section 8.3 below, OMT agrees to indemnify, hold harmless and defend Licensee, its affiliates, directors, officers, licensors, employees and agents (each a "Licensee Indemnitee") from and against any and all losses, damages, liabilities, costs and expenses (including reasonable attorneys' fees and expenses) (collectively, "Losses") payable to unaffiliated third parties, incurred by Licensee Indemnitees in connection with any and all suits, investigations, claims or demands of a third party (collectively, "Third Party Claims") to the extent arising from any alleged infringement or misappropriation of such third party's intellectual property rights arising from or occurring as a result of the use by Licensee or any Outlicensee of Animals to generate Antibodies. Notwithstanding anything to the contrary herein, in no event shall OMT be obligated to indemnify Licensee Indemnitees for any Third Party Claims to the extent such Third Party Claims (i) would be subject to indemnification by Licensee pursuant to Section 8.2, or (ii) arise in connection with any modifications of the Animals, or any combination of the Animals with any other material or organism, in each case not made by OMT, or (iii) arising in connection with any use of the Animals that is not strictly in accordance with this Agreement."

16. Section 8.2 of the Agreement shall be deleted in its entirety and replaced with the following:

"Indemnification of OMT. Subject to Section 8.3 below, Licensee agrees to indemnify, hold harmless and defend OMT, its affiliates, directors, officers, licensors, employees and agents (each an "OMT Indemnitee") from and against all Losses incurred by OMT Indemnitees in connection with any and all Third Party Claims to the extent arising from (a) the production, use, marketing, or sale of Antibodies or Products by Licensee or any Outlicensee (or either of their licensees), and (b) the use of any Animals that is not strictly in accordance with this Agreement."

17. Section 9.4 of the Agreement shall be deleted in its entirety and replaced with the following:

"Termination for IP Challenge. To the fullest extent allowed by applicable law, OMT shall have the right, upon written notice to Licensee,

to terminate in full (a) this Agreement, in the event that Licensee directly challenges in any legal or administrative proceeding the patentability, enforceability, or validity of any of OMT's intellectual property rights covering the Animals, or (b) any Outlicensee's Outlicensing Agreement, in the event that such Outlicensee directly challenges in any legal or administrative proceeding the patentability, enforceability, or validity of any of OMT's intellectual property rights covering the Animals; provided that OMT shall have no right to terminate any Outlicensing Agreement under this Section 9.4 for any challenge by a Outlicensee if such challenge is dismissed within sixty (60) days of OMT's notice to Licensee under this Section 9.4 and not thereafter continued."

18. In the event of any discrepancies or conflicting terms between this Amendment No. 1 and the Agreement, the terms of this Amendment No. 1 shall control.

19. The Agreement and this Amendment No. 1 represent the complete and entire understanding between the Parties regarding the subject matter hereof and supersede all prior or contemporaneous negotiations, representations or agreements, either written or oral, regarding this subject matter.

20. This Amendment No. 1 and the rights and obligations of the Parties hereunder shall be governed by the laws of the State of California, without regard to the conflicts of law provisions thereof.

21. This Amendment No. 1 may be executed in counterparts, each of which shall be deemed an original and, together, one and the same instrument. A facsimile, PDF or any other copy of this Amendment No. 1 signed by a Party is binding upon the signing Party to the same extent as the original of the signed Amendment No. 1, and may be delivered electronically.

22. Except for the matters set forth in this Amendment No. 1, all other terms of the Agreement shall remain unchanged and in full force and effect.

[Signature Page Follows]

IN WITNESS WHEREOF, the Parties hereto have duly executed this Amendment No. 1 as of the Amendment No. 1 Effective Date.

OMT, INC.		WUXI BIOLOGICS (HONG KONG) LIMITED	
By:	/s/ Matthew Korenberg	By:	/s/ Chris Chen
Name:	Matthew Korenberg	Name:	Chris Chen
Title:	CFO	Title:	Executive director and CEO

Summary report: Litéra® Change-Pro TDC 10.1.0.400 Document comparison done on 8/7/2018 11:51:08 AM	
Style name: L&W with Moves	
Intelligent Table Comparison: Active	
Original DMS: iw://US-DOCS/US-DOCS/102810702/1	
Modified DMS: iw://US-DOCS/US-DOCS/102810702/2	
Changes:	
Add	36
~~Delete~~	18
~~Move From~~	0
Move To	0
Table Insert	0
~~Table Delete~~	4
Table moves to	0
~~Table moves from~~	0
Embedded Graphics (Visio, ChemDraw, Images etc.)	0
Embedded Excel	0
Format changes	0
Total Changes:	58

Exhibit 10.15

***Text Omitted and Filed Separately with the Securities and Exchange Commission. Confidential Treatment Requested Under 17 C.F.R. Sections 200.80(b)(4) and 240.24b-2.

AMENDMENT NUMBER TWO TO PLATFORM LICENSE AGREEMENT

This Amendment Number Two to Platform License Agreement (this "Amendment No. 2") is entered into effective as of June 25, 2018 ("Amendment No. 2 Effective Date") and made by and between OMT, Inc. ("OMT"), which has its principal place of business at 3911 Sorrento Valley Boulevard, Suite 110, San Diego, California 92121, U.S.A., and Wuxi Biologics Ireland Limited ("Licensee"), which has its principal place of business at One Spencer Dock, North Wall Quay, Dublin 1, Ireland. OMT and Licensee may each be referred to herein as a "Party" and collectively as the "Parties."

WHEREAS, OMT and WuXi AppTec Biopharmaceuticals Co., Ltd., which has its principal place of business at 108 Meiliang Rd., Mashan, Wuxi, P.R. China, entered into the Platform License Agreement, effective on March 23, 2015 (the "Original Agreement");

WHEREAS, pursuant to the Assignment and Assumption Agreement entered by and among OMT, WuXi AppTec Biopharmaceuticals Co., Ltd., and Wuxi Biologics (Hong Kong) Limited as of July 19, 2016, WuXi AppTec Biopharmaceuticals Co., Ltd. assigned the Original Agreement to Wuxi Biologics (Hong Kong) Limited;

WHEREAS, OMT and Wuxi Biologics (Hong Kong) Limited amended the Original Agreement by Amendment Number One to Platform License Agreement, effective as of June 11, 2017 (together with the Original Agreement, the "Agreement");

WHEREAS, pursuant to the Assignment and Assumption Agreement entered by and among the Parties and Wuxi Biologics (Hong Kong) Limited as of June 25, 2018, Wuxi Biologics (Hong Kong) Limited assigned the Agreement to Licensee; and

WHEREAS, the Parties desire to amend certain terms of the Agreement in accordance with this Amendment No. 2.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged by the Parties, the Parties, intending to be legally bound, agree as follows:

1. All capitalized terms used in this Amendment No. 2 and not otherwise defined in this Amendment No. 2 shall have the meanings assigned to such terms in the Agreement.

2. Within ten (10) days of the Amendment No. 2 Effective Date, Licensee shall pay OMT ~~fifty-one million U.S. dollars (US $51 million), which is in lieu of any milestone payments that will become due or payable arising under the Agreement after the Amendment No. 2 Effective Date~~[***]. Upon receipt of the payment described in this

[***] Certain information on this page has been omitted and filed separately with the

Paragraph 2, above, OMT acknowledges and agrees that Licensee shall have no further obligation to pay any milestone payments under the Agreement.

3. The following shall be added to the end of Section 3.1 of the Agreement:

> "If, OMT intends to or does cease supplying Animals directly or through authorized third parties in accordance with this Section 3.1 for more than five (5) consecutive months for any reason including, but not limited to, bankruptcy of OMT, voluntary or involuntary cessation of OMT's Animal supply business, or change of control of OMT, OMT shall immediately notify Licensee in writing of such intent or cessation, and, to the extent permitted under applicable law, shall grant to Licensee the right to breed the Animals for use consistent with this Agreement, under any and all intellectual property rights, including but not limited to any and all patents and patent applications, know-how, and trade secrets, owned or otherwise controlled by OMT that are necessary for Licensee to breed the Animals for use consistent with this Agreement, and shall transfer to Licensee the technologies that are necessary for Licensee to breed the Animals for use consistent with this Agreement ("Animal Technology Transfer"). OMT shall provide reasonable technical assistance requested by Licensee to enable the Animal Technology Transfer and shall execute any documentation reasonably necessary to transfer such technology and any regulatory or other governmental consents or approvals regarding the same, and will novate any contracts with any third party that relate solely to the provision of such Animals to the benefit of Licensee. For the avoidance of doubt, the royalty obligations provided in Sections 5.2(a), (b) and (c) will remain unchanged."

4. Section 4.2(a) of the Agreement shall be deleted in its entirety and replaced with the following:

> "Relative to OMT, Licensee will exclusively own the Antibodies and any Products (including Products developed by any Outlicensee) and all intellectual property rights therein, including any patent rights, developed by Licensee or any such Outlicensee at any time under this Agreement (collectively, "IP Rights"), and each hereby makes all assignments necessary to achieve the foregoing. Subject to compliance with all terms and conditions of this Agreement, Licensee hereby grants OMT a non-exclusive, irrevocable, perpetual, worldwide, royalty-free, non-sublicenseable, non-transferable right and license in and to the IP Rights, to the extent necessary to allow OMT to exercise its rights hereunder

Commission. Confidential treatment has been requested with respect to the omitted portions.

and/or to allow OMT to exploit such IP Rights for non-commercial purposes including research, provided that OMT will not distribute, sell, offer for sale, use, or otherwise transfer any such Antibodies and Products."

5. Section 4.2(b) of the Agreement shall be deleted in its entirety and replaced with the following:

> "No less frequently than once per each calendar quarter, Licensee shall provide to OMT a report summarizing Licensee's and Outlicensees' prosecution and maintenance activities regarding any patent rights with respect to the IP Rights, including, if requested by OMT, copies of any significant office actions, communications, and correspondence relating to such patent rights. OMT shall have the right to comment on and to discuss such activities, and Licensee shall consider (and cause the applicable Outlicensees to consider) OMT's comments in good faith."

6. Section 4.3(a) of the Agreement shall be deleted in its entirety and replaced with the following:

> "China Outlicensing Agreement. Licensee may authorize, including without limitation under an assignment, a license or option grant and/or an appointment as distributor, a third party to use, develop, market, distribute, offer for sale, and/or sell an Antibody in China (and, as applicable with respect to Existing Antibodies, the China Plus Territory) solely pursuant to an agreement that is consistent with the terms and conditions of this Agreement, including without limitation this Section 4.3(a) (each such third party agreement, a "China Outlicensing Agreement"). Pursuant to a China Outlicensing Agreement, Licensee may distribute or otherwise transfer any Antibodies generated by or on behalf of Licensee to the applicable China Outlicensee using antigens selected by Licensee or such China Outlicensee. Licensee shall be responsible and liable for all actions and omissions of China Outlicensees in connection with any such Antibodies. Licensee may provide (i) any such resulting Antibodies to a China Outlicensee that is bound by a China Outlicensing Agreement; and (ii) Existing Antibodies to a China Outlicensee that is bound by a written addendum to such China Outlicensing Agreement for use, development, and marketing in the China Plus Territory (a "China Plus Addendum", which shall be deemed a part of the applicable China Outlicensing Agreement). Each China Outlicensing Agreement will include payment provisions that enable Licensee to comply with its obligations to make payments to OMT under this Agreement, and will prohibit the licensing, distribution, sale, offer for sale, use, or other transfer of any Antibody or Product outside of China (and as applicable with respect to Existing Antibodies, the China Plus Territory) by or on

behalf of the applicable China Outlicensee, where "use" includes development of and distribution of Products."

7. The last sentence of Section 4.3(b) of the Agreement shall be deleted in its entirety and replaced with the following sentence:

> "Each Ex-China Outlicensing Agreement will prohibit the licensing, distribution, sale, offer for sale, use, or other transfer of any Antibody or Product in and/or into China (and, as applicable, with respect to Existing Antibodies, the China Plus Territory) by or on behalf of the applicable Ex-China Outlicensee, where "use" includes development of and distribution of Products."

8. Section 4.3(d) of the Agreement shall be deleted in its entirety and replaced with the following:

> "Licensee may not outlicense or otherwise provide rights in any Antibodies to any third party except pursuant to Section 4.3(a), (b), and/or (c)."

9. The first sentence of Section 4.3(f) of the Agreement shall be deleted and replaced with the following sentence:

> "Each Outlicensing Agreement shall contain terms no less protective of OMT (including without limitation OMT's intellectual property rights in the Animals and Animal Improvements) than those set forth in this Agreement."

10. The last sentence of Section 4.3(f) of the Agreement shall be deleted and replaced with the following sentence:

> "Licensee will keep OMT reasonably informed of the status of any Outlicensing Agreements, and promptly after execution of the Outlicensing Agreement, Licensee shall provide to OMT a full copy of such Outlicensing Agreement (with any confidential or financial terms redacted), translated into English if applicable."

11. Section 4.4 of the Agreement shall be deleted in its entirety and replaced with the following:

> "As between the parties, and without limiting any other available remedy, OMT owns (i) the Animals and (ii) any modification, improvement, enhancement, or progeny of the Animals ("Animal Improvements") created in violation of Section 4.1(a) above, and all intellectual property rights in any of the foregoing. Licensee hereby makes (and will cause its Approved Affiliates and its and their Approved Subcontractors, and any Outlicensee, as applicable, to make) all assignments necessary to

accomplish the foregoing ownership with respect to any Animal Improvements. Licensee acknowledges and agrees that the Animals and Animal Improvements, together with any related biological material or substance that is replicated, synthesized or in any way derived from the Animals (including progeny), except for Antibodies, include and constitute valuable trade secrets of OMT, and OMT has used diligent efforts to maintain such items as its trade secrets and Confidential Information."

12. Section 4.5(a) of the Agreement shall be deleted in its entirety and replaced with the following:

"Each of OMT and Licensee shall notify the other promptly in writing when each learns of or reasonably suspects infringement of any IP Rights by a third party (an "Infringement"). Licensee, and its Outlicensees, shall have the first right to enforce any IP Right in the Territory, and control, defend, and settle such suit in a manner consistent with the terms and provisions of this Agreement, and recover any damages, awards, or settlements resulting therefrom, subject to Section 4.5(c). OMT agrees to use commercially reasonable efforts to reasonably cooperate in any such litigation, including participating in a suit if required to provide standing."

13. Section 4.5(b) of the Agreement shall be deleted in its entirety and replaced with the following:

"If Licensee or its Outlicensee does not bring suit to enforce the applicable IP Rights with respect to an Infringement within one hundred and eighty (180) days of becoming aware that such Infringement exists, then OMT may, in its sole judgment and at its own expense, take steps to enforce any such rights, including instituting suit against any such infringer or alleged infringer, and control, defend and settle such suit in a manner consistent with the terms and provisions hereof, and recover any damages, awards or settlements resulting therefrom, subject to Section 4.5(c). Licensee agrees to reasonably cooperate in any such litigation, including participating in a suit if required to provide standing."

14. A new Section 4.8 shall be added to the Agreement as follows:

"Non-Animal Improvements. Licensee, or Outlicensees, shall solely own any improvements developed by Licensee or any such Outlicensee to the Antibodies and Products that are not Animal Improvements ("Non-Animal Improvements"). Non-Animal Improvements are derivatives of Antibodies, bispecific/multispecific antibodies, Antibody-drug conjugates, and any drugs or further products generated from the Antibodies, in each case to the extent that it is not an Animal Improvement. All intellectual property rights developed by Licensee or an Outlicensee in any Non-Animal Improvement at any time under this Agreement shall be exclusively

owned by Licensee or the Outlicensee. For the avoidance of doubt, Non-Animal Improvements do not include Animals or Animal Improvements."

15. A new Section 5.1(d) shall be added to the Agreement as follows:

> "Licensee shall be required to make each of the payments set forth in Sections 5.1(a), (b), and (c) only if such payment becomes payable in accordance with the terms of Section 5.1(a), (b), or (c) on or before the Amendment No. 2 Effective Date. For clarity, Licensee shall not be required to make any payment set forth in Sections 5.1(a), (b), and (c) if such payment becomes payable in accordance with the terms of Section 5.1(a), (b), or (c) after the Amendment No. 2 Effective Date."

16. All instances of the term "Joint Rights" in the Agreement that are not modified by the above provisions are hereby modified to the term "IP Rights". The Parties agree that this Paragraph 16 retroactively applies to all Outlicensee Agreements entered into even before this Amendment No. 2 Effective Date.

17. In the event that OMT does not receive the ~~fifty-one million U.S. dollars (US $51 million)~~ [***] set forth in Paragraph 2 of this Amendment No. 2 within ten (10) days of the Amendment No. 2 Effective Date, OMT will have the right to terminate this Amendment No. 2 immediately upon written notice. If OMT terminates this Amendment No. 2 as set forth in this Paragraph 17, above, this Amendment No 2 shall have no force or effect, retroactive to the Amendment No 2 Effective Date, and the Agreement shall continue in full force and effect as it existed prior to the Amendment No. 2 Effective Date.

18. In the event of any discrepancies or conflicting terms between this Amendment No. 2 and the Agreement, the terms of this Amendment No. 2 shall control.

19. The Agreement and this Amendment No. 2 represent the complete and entire understanding between the Parties regarding the subject matter hereof and supersede all prior or contemporaneous negotiations, representations or agreements, either written or oral, regarding this subject matter.

20. This Amendment No. 2 and the rights and obligations of the Parties hereunder shall be governed by the laws of the State of California, without regard to the conflicts of law provisions thereof.

[***] Certain information on this page has been omitted and filed separately with the Commission. Confidential treatment has been requested with respect to the omitted portions.

21. This Amendment No. 2 may be executed in counterparts, each of which shall be deemed an original and, together, one and the same instrument. A facsimile, PDF or any other copy of this Amendment No. 2 signed by a Party is binding upon the signing Party to the same extent as the original of the signed Amendment No. 2, and may be delivered electronically.

22. Except for the matters set forth in this Amendment No. 2, all other terms of the Agreement shall remain unchanged and in full force and effect.

[Signature page follows.]

IN WITNESS WHEREOF, the Parties hereto have duly executed this Amendment No. 2:

OMT, INC.		WUXI BIOLOGICS IRELAND LIMITED	
By:	/s/ Charles Berkman	By:	/s/ Chris Chen
Name:	Charles Berkman	Name:	Chris Chen
Title:	VP & Secretary	Title:	Director
Date:	June 25, 2018	Date:	June 24, 2018

Summary report: Litéra® Change-Pro TDC 10.1.0.400 Document comparison done on 8/7/2018 11:54:53 AM	
Style name: L&W with Moves	
Intelligent Table Comparison: Active	
Original DMS: iw://US-DOCS/US-DOCS/102810859/1	
Modified DMS: iw://US-DOCS/US-DOCS/102810859/2	
Changes:	
Add	12
Delete	6
Move From:	0
Move To	0
Table Insert	0
Table Delete	0
Table moves to	0
Table moves from	0
Embedded Graphics (Visio, ChemDraw, Images etc.)	0
Embedded Excel	0
Format changes	0
Total Changes:	18

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, John L. Higgins, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Ligand Pharmaceuticals Incorporated;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 8, 2018

/s/ John L. Higgins

John L. Higgins
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO EXCHANGE ACT RULE 13a-14(a)/15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Matthew Korenberg, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Ligand Pharmaceuticals Incorporated;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 8, 2018

/s/ Matthew Korenberg

Matthew Korenberg
Executive Vice President, Finance and Chief Financial Officer
(Principal Financial Officer)

Exhibit 32.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER

In connection with the Quarterly Report of Ligand Pharmaceuticals Incorporated (the "Company") on Form 10-Q for the quarter ended June 30, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, John L. Higgins, Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 8, 2018

/s/ John L. Higgins

John L. Higgins
Chief Executive Officer
(Principal Executive Officer)

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. Section 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing. A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER

In connection with the Quarterly Report of Ligand Pharmaceuticals Incorporated (the "Company") on Form 10-Q for the quarter ended June 30, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Matthew Korenberg, Vice President, Finance and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) The Report fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 8, 2018

/s/ Matthew Korenberg

Matthew Korenberg
Executive Vice President, Finance and Chief Financial Officer
(Principal Financial Officer)

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. Section 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing. A signed original of this written statement required by Section 906 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.