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, 2019

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)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	Trading symbol:	Name of each exchange on which registered:
Common Stock , par value $0.001 per share	**LGND**	**The Nasdaq Global Market**

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 every Interactive Data File required to be submitted 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 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	☐	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, 2019, the registrant had 19,011,474 shares of common stock outstanding.

LIGAND PHARMACEUTICALS INCORPORATED
QUARTERLY REPORT

FORM 10-Q

TABLE OF CONTENTS

GLOSSARY OF TERMS AND ABBREVIATIONS

Abbreviation	Definition
2018 Annual Report	Annual Report on Form 10-K for the year ended December 31, 2018, filed with the SEC on February 28, 2019
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
Ab Initio	Ab Initio Biotherapeutics, Inc.
Amgen	Amgen, Inc.
ANDA	Abbreviated New Drug Application
ASC	Accounting Standards Codification
ASU	Accounting Standards Update
Aziyo	Aziyo Med, LLC
Bayer	Bayer HealthCare LLC
CE	Captisol-enabled
CEO	Chief Executive Officer
Company	Ligand Pharmaceuticals Incorporated, including subsidiaries
COPD	Chronic obstructive pulmonary disease
CorMatrix	CorMatrix Cardiovascular, Inc.
CVR	Contingent value right
Crystal	Crystal Bioscience, Inc.
CStone Pharmaceuticals	CStone Pharmaceuticals (Suzhou) Co., Ltd.
Cumulus	Cumulus Oncology Ltd
CyDex	CyDex Pharmaceuticals, Inc.
Daiichi Sankyo	Daiichi Sankyo Company, LTD
Dianomi Therapeutics	Dianomi Therapeutics, 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
GenMab	GenMab A/S
GigaGen	GigaGen, Inc.
GPCR	G-protein coupled receptor
GRA	Glucagon receptor antagonist
Ligand	Ligand Pharmaceuticals Incorporated, including subsidiaries
Melinta Therapeutics	Melinta Therapeutics, Inc.
Metabasis	Metabasis Therapeutics, Inc.
Metavant	Metavant Sciences
Millennium	Millennium Pharmaceuticals, Inc.
NDA	New Drug Application
Novan	Novan, Inc.
Novartis	Novartis AG
OTTI	Other-than-temporary impairment
PEGS	Protein Engineering Summit
PhoreMost Limited	PhoreMost
Q2 2018	The Company's fiscal quarter ended June 30, 2018
Q2 2019	The Company's fiscal quarter ended June 30, 2019
Roivant	Roivant Sciences GMBH
Sage Therapeutics	Sage Therapeutics, Inc.
SEC	Securities and Exchange Commission
Seelos Therapeutics	Seelos Therapeutics, Inc.
Selexis	Selexis, SA
Sermonix Pharmaceuticals	Sermonix Pharmaceuticals, LLC
sNDA	Supplemental New Drug Application

SQ Innovation	SQ Innovation, Inc.
Takeda	Takeda Pharmaceutical Company
Teva	Teva Pharmaceuticals USA, Inc., Teva Pharmaceutical Industries Ltd. and Actavis, LLC, collectively
Vernalis	Vernalis plc
VDP	Vernalis Design Platform
Verona Pharma	Verona Pharma plc
Viking	Viking Therapeutics, Inc.
WuXi	WuXi Biologics Ireland Limited
xCella Biosciences	xCella Biosciences, Inc.
YTD	Year-to-date

PART I - FINANCIAL INFORMATION

ɛm 1. Condensed Consolidated Financial Statements

LIGAND PHARMACEUTICALS INCORPORATED
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited, in thousands, except par value)

	June 30, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 273,047	$ 117,164
Short-term investments	1,059,002	601,217
Investment in Viking	60,376	55,448
Accounts receivable, net	20,259	55,850
Inventory	9,638	7,124
Derivative asset	14,313	22,576
Other current assets	5,672	11,161
Total current assets	1,442,307	870,540
Deferred income taxes, net	—	46,521
Intangible assets, net	212,609	219,793
Goodwill	88,000	86,646
Commercial license and other economic rights, net	40,008	31,460
Property and equipment, net	6,268	5,372
Operating lease right-of-use assets	10,964	—
Other assets	1,680	471
Total assets	$ 1,801,836	$ 1,260,803
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 2,888	$ 4,183
Accrued liabilities	11,540	19,200
Income tax payable	47,455	—
Current contingent liabilities	4,763	5,717
Deferred revenue	939	3,286
2019 convertible senior notes, net	27,087	26,433
Derivative liability	14,313	23,430
Total current liabilities	108,985	82,249
2023 convertible senior notes, net	624,209	609,864
Long-term contingent liabilities	8,314	6,825
Deferred income taxes, net	694	—
Long-term operating lease liabilities	10,489	—
Other long-term liabilities	7,692	951
Total liabilities	760,383	699,889
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.001 par value; 5,000 shares authorized; none issued and outstanding at June 30, 2019 and December 31, 2018	—	—
Common stock, $0.001 par value; 60,000 shares authorized; 19,390 and 20,766 shares issued and outstanding at June 30, 2019 and December 31, 2018, respectively	19	21
Additional paid-in capital	619,255	791,114
Accumulated other comprehensive loss	(542)	(1,024)
Retained earnings (accumulated deficit)	422,721	(229,197)
Total stockholders' equity	1,041,453	560,914
Total liabilities and stockholders' equity	$ 1,801,836	$ 1,260,803

See accompanying notes to unaudited condensed consolidated financial statements.

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,	
	2019	2018	2019	2018
Revenues:				
Royalties	$ 6,626	$ 31,396	$ 26,164	$ 52,216
Material sales	8,549	7,612	17,508	12,003
License fees, milestones and other revenues	9,812	51,035	24,799	81,981
Total revenues	24,987	90,043	68,471	146,200
Operating costs and expenses:				
Cost of material sales	2,405	1,134	6,263	1,922
Amortization of intangibles	3,505	3,305	7,008	6,584
Research and development	12,213	6,135	23,502	13,540
General and administrative	10,994	9,294	22,082	16,938
Total operating costs and expenses	29,117	19,868	58,855	38,984
Gain from sale of Promacta license	—	—	812,797	—
Income (loss) from operations	(4,130)	70,175	822,413	107,216
Other income (expense):				
Gain (loss) from Viking	(12,365)	39,963	4,928	61,808
Interest income	9,285	2,762	15,194	3,637
Interest expense	(9,012)	(13,454)	(17,918)	(16,933)
Other income (expense), net	(1,806)	(3,867)	68	(4,835)
Total other income (loss), net	(13,898)	25,404	2,272	43,677
Income (loss) before income taxes	(18,028)	95,579	824,685	150,893
Income tax benefit (expense)	3,609	(22,419)	(172,767)	(32,452)
Net income (loss)	$ (14,419)	$ 73,160	$ 651,918	$ 118,441
Basic net income (loss) per share	$ (0.74)	$ 3.45	$ 32.60	$ 5.58
Shares used in basic per share calculations	19,558	21,212	20,000	21,209
Diluted net income (loss) per share	$ (0.74)	$ 2.99	$ 31.34	$ 4.81
Shares used in diluted per share calculations	19,558	24,438	20,799	24,618

See accompanying notes to unaudited condensed consolidated financial statements.

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

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Net income (loss):	$ (14,419)	$ 73,160	$ 651,918	$ 118,441
Unrealized net gain (loss) on available-for-sale securities, net of tax	503	135	733	(14)
Foreign currency translation	(542)	—	(251)	—
Comprehensive income (loss)	$ (14,458)	$ 73,295	$ 652,400	$ 118,427

See accompanying notes to unaudited condensed consolidated financial statements.

LIGAND PHARMACEUTICALS INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Unaudited)
(in thousands)

	Common Stock		Additional paid in capital	Accumulated other comprehensive income (loss)	Retain earnings (Accumulated deficit)	Total stockholders' equity
	Shares	Amount				
Balance at January 1, 2019	20,765	$ 21	$ 791,114	$ (1,024)	$ (229,197)	$ 560,914
Issuance of common stock under employee stock compensation plans, net	135	—	(991)	—	—	(991)
Share-based compensation	—	—	5,347	—	—	5,347
Repurchase of common stock	(1,236)	(1)	(151,584)	—	—	(151,585)
Unrealized net gain on available-for-sale securities, net of deferred tax	—	—	—	230	—	230
Foreign currency translation adjustment	—	—	—	291	—	291
Other tax adjustments	—	—	(569)	—	—	(569)
Net income	—	—	—	—	666,337	666,337
Balance at March 31, 2019	19,664	$ 20	$ 643,317	$ (503)	$ 437,140	$ 1,079,974
Issuance of common stock under employee stock compensation plans, net	17	—	740	—	—	740
Share-based compensation	—	—	6,571	—	—	6,571
Repurchase of common stock	(291)	(1)	(33,716)	—	—	(33,717)
Unrealized net gain on available-for-sale securities, net of deferred tax	—	—	—	503	—	503
Foreign currency translation adjustment	—	—	—	(542)	—	(542)
Other tax adjustments	—	—	2,343	—	—	2,343
Net loss	—	—	—	—	(14,419)	(14,419)
Balance at June 30, 2019	19,390	$ 19	$ 619,255	$ (542)	$ 422,721	$ 1,041,453

	Common Stock		Additional paid in capital	Accumulated other comprehensive income (loss)	Accumulated deficit	Total stockholders' equity
	Shares	Amount				
Balance at January 1, 2018	21,149	$ 21	$ 798,205	$ 2,486	$ (400,924)	$ 399,788
Issuance of common stock under employee stock compensation plans, net	166	1	5,118	—	—	5,119
Reclassification of equity component of currently redeemable convertible notes	—	—	2,781	—	—	2,781
Share-based compensation	—	—	4,555	—	—	4,555
Repurchase of common stock	(13)	(1)	(1,894)	—	—	(1,895)
Unrealized net loss on available-for-sale securities, net of deferred tax	—	—	—	(110)	—	(110)
Cumulative-effect adjustment from adoption of ASU 2016-01	—	—	—	(2,662)	2,662	—
Cumulative-effect adjustment from adoption of ASU 2014-09, net of tax	—	—	—	—	25,583	25,583
Net income	—	—	—	—	45,279	45,279
Balance at March 31, 2018	21,302	$ 21	$ 808,765	$ (286)	$ (327,400)	$ 481,100
Issuance of common stock under employee stock compensation plans, net	60	—	3,296	—	—	3,296
Reclassification of equity component of currently redeemable convertible notes	—	—	16,078	—	—	16,078
Share-based compensation	—	—	4,812	—	—	4,812
Repurchase of common stock	(267)	—	(50,832)	—	—	(50,832)
Unrealized net loss on available-for-sale securities, net of deferred tax	—	—	—	(495)	—	(495)
Derivative associated with 2019 Notes and Bond Hedge	—	—	(1,559)	—	—	(1,559)
Loss on settlement of 2019 Notes	—	—	590	—	—	590
Tax effect on 2019 Notes transactions	—	—	67	—	—	67
Derivative associated with 2023 Notes and Bond Hedge	—	—	(1,807)	—	—	(1,807)
Warrant derivative in connection with 2023 Notes	—	—	97,805	—	—	97,805
Tax effect for 2023 Notes transactions	—	—	(3,240)	—	—	(3,240)
Other tax adjustments	—	—	208	630	—	838
Net income	—	—	—	—	73,160	73,160
Balance at June 30, 2018	21,095	$ 21	$ 874,183	$ (151)	$ (254,240)	$ 619,813

See accompanying notes to unaudited condensed consolidated financial statements.

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

	Six months ended June 30,	
	2019	**2018**
Cash flows from operating activities:		
Net income	$ 651,918	$ 118,441
Adjustments to reconcile net income to net cash provided by operating activities:		
Gain from sale of Promacta license	(812,797)	—
Non-cash change in estimated fair value of contingent liabilities	984	2,730
Depreciation and amortization	8,781	6,013
Amortization of discount on investments, net	(6,023)	(1,150)
Amortization of debt discount and issuance fees	14,999	15,455
Amortization of other economic rights	4,370	—
Share-based compensation	11,918	9,367
Deferred income taxes	55,661	32,263
Gain from investment in Viking	(4,928)	(61,808)
Other	(3,973)	1,701
Royalties recorded in retained earnings upon adoption of ASC 606	—	32,707
Changes in operating assets and liabilities:		
Accounts receivable, net	35,591	(16,405)
Inventory	(4,573)	(4,395)
Accounts payable and accrued liabilities	(3,780)	80
Income tax payable	47,455	—
Other economic rights	(12,000)	—
Other	597	(594)
Net cash provided by (used in) operating activities	(15,800)	134,405
Cash flows from investing activities:		
Proceeds from sale of Promacta license	812,797	—
Purchase of short-term investments	(1,281,274)	(745,783)
Proceeds from sale of short-term investments	43,724	12,791
Proceeds from maturity of short-term investments	791,006	110,175
Other	(5,673)	2,498
Net cash provided by (used in) investing activities	360,580	(620,319)
Cash flows from financing activities:		
Repayment of debt	—	(21,785)
Gross proceeds from issuance of 2023 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	2,643	11,849
Taxes paid related to net share settlement of equity awards	(2,893)	(3,434)
Share repurchase	(189,917)	(52,727)
Net cash provided by (used in) financing activities	(190,167)	616,753
Effect of exchange rate changes on cash	7	—
Net increase in cash, cash equivalents and restricted cash	154,620	130,839
Cash, cash equivalents and restricted cash at beginning of period	119,780	20,620
Cash, cash equivalents and restricted cash at end of period	$ 274,400	$ 151,459

Supplemental disclosure of cash flow information:				
Interest paid	$	2,915	$	919
Taxes paid	$	69,703	$	285
Restricted cash in other current assets	$	1,353	$	—
Supplemental schedule of non-cash activity:				
Accrued fixed asset purchases	$	54	$	66
Accrued inventory purchases	$	—	$	752
Unrealized gain on AFS investments	$	938	$	—
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 to unaudited condensed consolidated financial statements.

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

Unless the context requires otherwise, references in this report to "Ligand," "we," "us," the "Company," and "our" refer to Ligand Pharmaceuticals Incorporated and its consolidated subsidiaries.

1. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation

Our 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 our 2018 Annual Report. 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 consolidated financial statements have been reclassified to conform with the current period presentation. Specifically, our investment in Viking warrants was reclassified from "other current assets" to "investment in Viking" in the audited consolidated balance sheet as of December 31, 2018.

Prior Period Immaterial Error

In connection with the preparation of our condensed consolidated statement of cash flows for the six months ended June 30, 2019, an immaterial error was identified in our condensed consolidated statement of cash flows for the three months ended March 31, 2019 by including a $4.6 million accrued liability for the share repurchase as of December 31, 2018 that was paid during the first quarter of 2019 in the cash flows for operating activities instead of financing activities. Our condensed consolidated statement of cash flows for the three months ended March 31, 2019 understated cash flows provided by operating activities by $4.6 million and understated cash flows used in financing activities by $4.6 million. We evaluated the materiality of the error considering both quantitative and qualitative factors as required by authoritative guidance and determined the related impact was not material to our previously issued condensed consolidated financial statements. The immaterial error has been corrected in our condensed consolidated statement of cash flows for the six months ended June 30, 2019. The immaterial error did not impact our condensed consolidated balance sheet as of March 31, 2019, nor did it impact our condensed consolidated statements of operations, comprehensive income or equity for the three months ended March 31, 2019.

Significant Accounting Policies

We have described our significant accounting policies in *Note 1, Basis of Presentation and Summary of Significant Accounting Policies*, of Notes to Consolidated Financial Statements in our 2018 Annual Report.

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

Leases - In February 2016, the FASB issued ASU 2016-02,*Leases (Topic 842)*. This standard requires organizations that lease assets to recognize the assets and liabilities created by those leases. The standard also requires disclosures to help investors and other financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. In 2018, the FASB issued guidance that provides an optional transition method for adoption of this standard, which allows organizations to initially apply the new requirements at the effective date, recognize a cumulative effect adjustment to the opening balance of retained earnings, and continue to apply the legacy guidance in ASC 840, *Leases (Topic 840)*, including its disclosure requirements, in the comparative periods presented. We adopted this standard on January 1, 2019 by applying this optional

transition method. For leases with a term of 12 months or less, we elected to not recognize lease assets and lease liabilities and expense the leases over a straight-line basis for the term of those leases. In addition, we elected the available package of practical expedients upon adoption, which allowed us to carry forward our historical assessment of whether existing agreements contained a lease and the classification of our existing operating leases. We did not elect to use the hindsight practical expedient to determine the lease term or evaluate impairment for existing leases. We continue to report our financial position as of December 31, 2018 under Topic 840 in our audited consolidated balance sheet. The adoption of this standards update resulted in the recognition of right-of-use assets of approximately $5.2 million and lease liabilities of approximately $5.9 million on our unaudited condensed consolidated balance as of January 1, 2019, with no material impact to our consolidated statement of operations. See *Note 8, Leases*, for further information regarding the impact of the adoption of ASU 2016-02 on our financial statements.

Accounting Standards Not Yet Adopted

Financial Instruments - In June 2016, the FASB issued ASU 2016-13,*Financial Instruments - Credit Losses: Measurement of Credit Losses on Financial Instruments (Topic 326)*, 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. ASU 2016-13 is effective for us beginning in the first quarter of 2020, with early adoption permitted. We are currently evaluating the impact of this ASU on our consolidated financial statements.

Fair Value Measurement - In August 2018, the FASB issued ASU 2018-13,*Fair Value Measurement: Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement (Topic 820)*, which modifies the disclosure requirements on fair value measurements. ASU 2018-13 is effective for us beginning in the first quarter of 2020, with earlier adoption permitted. We are currently evaluating the impact of this ASU on our consolidated financial statements.

Collaborative Arrangements - In November 2018, the FASB issued ASU 2018-18,*Collaborative Arrangements: Clarifying the Interaction between Topic 808 and Topic 606 (Topic 808)*. The new standard clarifies that certain transactions between participants in a collaborative arrangement should be accounted for under Topic 606,*Revenue from Contracts with Customers*, when the counterparty is a customer for a good or service that is a distinct unit of account. The amendments also preclude entities from presenting consideration from transactions with a collaborator that is not a customer together with revenue recognized from contracts with customers. The new standard is effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption is permitted in any interim period for entities that have adopted ASC 606. The standard should be applied retrospectively to the period when we initially adopted ASC 606. We do not expect the adoption of this standard to have a material impact on our 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 our partners, Captisol material sales, license fees and development, regulatory and sales based milestone payments, and other service revenue.

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 our 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 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 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 material 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 and certain service revenue, we generally receive payment at the point we satisfy our obligation or soon after. Therefore, we do not generally carry a contract asset balance. Any fees billed in advance of being earned are recorded as deferred revenue. During the three and six months ended June 30, 2019, the amount recognized as revenue that was previously deferred was $2.7 million and $4.1 million, respectively. During the three and six months ended June 30, 2018, the amount recognized as revenue that was previously deferred was not material.

Disaggregation of Revenue

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

	Three months ended June 30,		Six months ended June 30,	
	2019	**2018**	**2019**	**2018**
Royalties				
Promacta	$ —	$ 24,806	$ 14,193	$ 40,379
Kyprolis	4,882	4,730	8,715	8,125
Evomela	1,144	1,160	2,055	2,760
Other	600	700	1,201	952
	$ 6,626	$ 31,396	$ 26,164	$ 52,216
Material Sales				
Captisol	$ 8,549	$ 7,612	$ 17,508	$ 12,003
License fees, milestones and other				
License Fees	$ 1,990	$ 47,981	$ 2,840	$ 74,936
Milestone	4,175	1,919	16,107	4,744
Other	3,647	1,135	5,852	2,301
	$ 9,812	$ 51,035	$ 24,799	$ 81,981
Total	$ 24,987	$ 90,043	$ 68,471	$ 146,200

Short-term Investments

Our investments consist of the following at June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019				December 31, 2018			
	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	$ 582,991	$ 462	$ (13)	$ 583,440	$ 311,066	$ 26	$ (29)	$ 311,063
Corporate bonds	46,360	160	—	46,520	53,223	1	(45)	53,179
Commercial paper	423,578	246	(19)	423,805	225,731	8	(76)	225,663
U.S. Government bonds	—	—	—	—	7,982	—	(9)	7,973
Municipal bonds	—	—	—	—	2,017	—	(4)	2,013
Corporate equity securities[1]	4,525	772	(216)	5,081	135	1,191	—	1,326
Warrants	—	156	—	156	—	—	—	—
	$ 1,057,454	$ 1,796	$ (248)	$ 1,059,002	$ 600,154	$ 1,226	$ (163)	$ 601,217

(1) The amortized cost for corporate equity securities represents the original purchase cost of the equity securities.

Inventory

Inventory, which consists of finished goods, is stated at the lower of cost or net realizable value. We determine cost using the first-in, first-out method or the specific identification method.

Goodwill and Other Identifiable Intangible Assets

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

	June 30, 2019	December 31, 2018
Goodwill	$ 88,000	$ 86,646
Definite lived intangible assets		
Complete technology	235,413	235,413
Less: accumulated amortization [1]	(41,448)	(35,070)
Trade name	2,642	2,642
Less: accumulated amortization	(1,114)	(1,048)
Customer relationships	29,600	29,600
Less: accumulated amortization	(12,484)	(11,744)
Total goodwill and other identifiable intangible assets, net	$ 300,609	$ 306,439

(1) accumulated amortization for complete technology includes immaterial amount of foreign currency translation adjustments for the complete technology acquired from the Vernalis acquisition.

Commercial License and Other Economic Rights

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

	June 30, 2019	December 31, 2018
Aziyo and CorMatrix	$ 17,696	$ 17,696
Novan	12,000	—
Palvella	10,000	10,000
Selexis	8,602	8,602
Dianomi	2,000	—
	50,298	36,298
Less: accumulated amortization attributed to principal or research and development	(10,290)	(4,838)
Total commercial license and other economic rights, net	$ 40,008	$ 31,460

Commercial license and other economics rights represent a portfolio of future milestone and royalty payment rights acquired from Selexis in April 2013 and April 2015, CorMatrix in May 2016, Palvella in December 2018, Dianomi in January 2019 and Novan in May 2019. Commercial license rights acquired are accounted for as financial assets and other economic rights are accounted for as funded research and developments as further discussed below.

In May 2017, we entered into a Royalty Agreement with Aziyo pursuant to which we will receive royalties from certain marketed products that Aziyo acquired from CorMatrix. We account for the Aziyo commercial license right as a financial asset in accordance with ASC 310, *Receivables*, and amortize the commercial license right using the effective interest method whereby we forecast 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, 2019 is 23%. Revenue is calculated by multiplying the carrying value of the commercial license right by the effective interest.

In December 2018, we entered into a development funding and royalties agreement with Palvella. Pursuant to the agreement, we may receive up to $8.0 million of milestone payments upon the achievement by Palvella of certain corporate, financing and regulatory milestones for PTX-022, a product candidate being developed to treat pachyonychia congentia. In addition to the milestone payments, Palvella will pay us tiered royalties from 5.0% to 9.8% based on any aggregate annual worldwide net sales of any PTX-022 products, subject to Palvella's right to reduce the royalty rates by making payments in certain circumstances. We paid Palvella an upfront payment of $10.0 million, which Palvella is required to use to fund the development of PTX-022. We are not obligated to provide additional funding to Palvella for the development or commercialization of PTX-022. We determined the economic rights related to Palvella should be characterized as a funded research and development arrangement, thus we account for it in accordance with ASC 730-20, *Research and Development Arrangements*, and will reduce our asset as the funds are expended by Palvella. We will evaluate the remaining asset basis for impairment on an ongoing basis. As it is anticipated, prior to the receipt of any payments from Palvella that the cost basis will be reduced to zero, we will recognize milestones and royalties as revenue when earned.

In May 2019, we entered into a development funding and royalties agreement with Novan, pursuant to which we will receive certain payments at specified milestones, as well as royalties on any future net sales of SB206, a product candidate being developed to treat molluscum contagiosum, and any other Novan products used for the treatment of molluscum ("Novan Molluscum Products"). We paid Novan an upfront payment of $12.0 million, which Novan is required to use to fund the development of SB206. We are not obligated to provide additional funding to Novan for the development or commercialization of SB206. Pursuant to the agreement, we will receive up to $20.0 million of milestone payments upon the achievement by Novan of certain regulatory milestones for SB206 or any other Novan Molluscum Product and commercial milestones. In addition to the milestone payments, Novan will pay us tiered royalties from 7.0% to 10.0% based on aggregate annual net sales of SB206 or any other Novan Molluscum Product in North America. We determined the economic rights related to Novan should be characterized as a funded research and development arrangement, thus we account for it in accordance with ASC 730-20 and will reduce our asset as the funds are expended by Novan. We will evaluate the remaining asset basis for impairment on an ongoing basis.

See further detail described in *Note 1, Basis of Presentation and Summary of Significant Accounting Policies*, of Notes to Consolidated Financial Statements in our 2018 Annual Report.

Viking

Our equity ownership interest in Viking decreased in the first quarter of 2018 to approximately12.4% due to Viking's financing events in February 2018. As a result, in February 2018, we concluded that we did not exert significant influence over Viking and discontinued accounting for our investment in Viking under the equity method. As of June 30, 2019 and December 31, 2018, we recorded our common stock of Viking at fair value of $50.1 million and $46.2 million, respectively, in "investment in Viking" in our consolidated balance sheets. We also have outstanding warrants to purchase 1.5 million shares of Viking's common stock at an exercise price of $1.50 per share. We recorded the warrants in “investment in Viking” in our condensed consolidated balance sheet at fair value of $10.3 million at June 30, 2019. Our investment in Viking warrants in the amount of $9.3 million was reclassified from “other current assets” to “investment in Viking” in the audited consolidated balance sheet as of December 31, 2018 to conform to the current period presentation.

Accrued Liabilities

Accrued liabilities consist of the following (in thousands):

	June 30, 2019	December 31, 2018
Compensation	$ 2,856	$ 4,045
Professional fees	738	942
Amounts owed to former licensees	411	428
Royalties owed to third parties	872	1,025
Payments due to broker for share repurchases	—	4,613
Return reserve	3,346	3,590
Restructuring	7	1,093
Current operating lease liabilities	989	—
Other	2,321	3,464
Total accrued liabilities	$ 11,540	$ 19,200

Share-Based Compensation

Share-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 share-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,	
	2019	2018	2019	2018
Share-based compensation expense as a component of:				
Research and development expenses	$ 2,528	$ 2,096	$ 4,655	$ 3,863
General and administrative expenses	4,043	2,716	7,263	5,504
	$ 6,571	$ 4,812	$ 11,918	$ 9,367

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,	
	2019	2018	2019	2018
Risk-free interest rate	1.9%	2.8%	2.4%	2.8%
Dividend yield	—	—	—	—
Expected volatility	40%	36%	43%	34%
Expected term	5.9	5.8	5.2	5.7

Derivatives

On May 22, 2018, we amended our 2019 Notes making an irrevocable election to settle the entire note in cash. As a result, we 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, we reclassified from equity to derivative asset the fair value of the bond hedge as of May 22, 2018. 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 liabilities associated with the 2019 Notes:

	As of June 30, 2019
Common stock price	$114.15
Exercise price, conversion premium and bond hedge	$75.05
Risk-free interest rate	2.21%
Volatility	35%
Dividend yield	—
Remaining contractual term (in years)	0.13

Net Income (loss) Per Share

Basic net income (loss) per share is calculated by dividing net income (loss) by the weighted-average number of common shares outstanding during the period. Diluted net 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.

All of the 0.8 million weighted average shares of outstanding equity awards as of June 30, 2019 were anti-dilutive due to the net loss for the three months ended June 30, 2019.

Potentially dilutive common shares consist of shares issuable under 2019 Notes and 2023 Notes, stock options and restricted stock. 2019 Notes and 2023 Notes have a dilutive impact when the average market price of our common stock exceeds the applicable conversion price of the respective notes. It is our intent and policy to settle conversions through combination settlement, which 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. In addition, after May 22, 2018, the 2019 Notes can only be settled in cash and therefore there has been no further impact on income per share of these notes since then. 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, the following amounts are assumed to be used to repurchase shares: proceeds from exercise of stock options and the average amount of unrecognized compensation expense for the awards.

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

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Weighted average shares outstanding:	19,558	21,212	20,000	21,209
Dilutive potential common shares:				
Restricted stock	—	60	38	62
Stock options	—	1,132	761	1,126
2019 Convertible Senior Notes	—	1,052	—	1,386
Warrants	—	982	—	835
Shares used to compute diluted income per share	19,558	24,438	20,799	24,618
Potentially dilutive shares excluded from calculation due to anti-dilutive effect	7,457	2,092	7,243	1,120

2. Sale of Promacta License

On March 5, 2019, we entered into an Asset Purchase Agreement (the "Asset Purchase Agreement") with RPI Finance Trust ("RPI"), doing business as "Royalty Pharma", who is not an affiliate. Under the Asset Purchase Agreement, we sold, transferred, assigned and conveyed to RPI, and RPI purchased, acquired and accepted from us, all of our rights, title and interest in and to the Purchased Assets, which include among other things the intellectual property and related know-how generated by us in connection with the license agreement (collectively, the "Purchased Assets"), dated December 29, 1994, by and between Novartis (as successor in interest to SmithKline Beecham Corporation) and Ligand, which allowed us to receive a royalty on net sales of Promacta. We concluded the sale does not qualify as a sale of a business, but as a sale of a non-financial asset. At the closing on March 6, 2019, RPI paid us $827.0 million in cash and we do not have any remaining performance obligations related to Novartis or RPI for Promacta. The carrying value of our Promacta asset as of March 6, 2019 was zero. Of the total cash proceeds from the sale, $14.2 million was recorded to revenue related to the Promacta royalty for the period between January 1, 2019 and March 6, 2019, and the remaining $812.8 million was recorded to income from operations in accordance with ASC 610-20, *Other Income - Gains and Losses from the Derecognition of Nonfinancial Assets*.

3. Fair Value Measurements

Assets and Liabilities Measured on a Recurring Basis

The following table presents the hierarchy for our assets and liabilities measured at fair value (in thousands):

	June 30, 2019				December 31, 2018			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Assets:								
Short-term investments[1]	$ 5,082	$ 1,053,764	$ 156	$ 1,059,002	$ 1,326	$ 599,891	$ —	$ 601,217
Investment in Viking common stock	50,116	—	—	50,116	46,191	—	—	46,191
Investment in Viking warrants [2]	10,260	—	—	10,260	9,257	—	—	9,257
Total assets	$ 65,458	$ 1,053,764	$ 156	$ 1,119,378	$ 56,774	$ 599,891	$ —	$ 656,665
Liabilities:								
Crystal contingent liabilities[3]	$ —	$ —	$ 4,987	$ 4,987	$ —	$ —	$ 6,477	$ 6,477
CyDex contingent liabilities	—	—	464	464	—	—	514	514
Metabasis contingent liabilities[4]	—	7,626	—	7,626	—	5,551	—	5,551
Amounts owed to former licensor	131	—	—	131	199	—	—	199
Total liabilities	$ 131	$ 7,626	$ 5,451	$ 13,208	$ 199	$ 5,551	$ 6,991	$ 12,741

1. Short-term investments in marketable debt securities with original maturities greater than 90 days are classified as available-for-sale securities based on management's intentions and are at 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. In addition, we have investment in warrants resulting from Seelos milestone payments that were settled in shares during the first quarter of 2019 and are at level 3 of the fair value hierarchy, based on intrinsic value estimated by management as of June 30, 2019.
2. Investment in warrants, which we received as a result of Viking's partial repayment of the Viking note receivable and our 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 our 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, 2019, most of the development and regulatory milestones were estimated to be highly probable of being achieved by 2019. Changes in these estimates may materially affect the fair value.
4. In connection with our acquisition of Metabasis in January 2010, we issued Metabasis stockholders four tradable CVRs, one CVR from each of four respective series of CVR, for each Metabasis share. The CVRs entitle Metabasis stockholders to cash payments as frequently as every six months as cash is received by us from proceeds from the sale or partnering of any of the Metabasis drug development programs, among other triggering events. The liability for the CVRs is determined using quoted prices in a market that is not active for the underlying CVR. The carrying amount of the liability may fluctuate significantly based upon quoted market prices and actual amounts paid under the agreements may be materially different than the carrying amount of the liability. Several of the Metabasis drug development programs have been outlicensed to Viking, including VK2809. VK2809 is a novel selective TR-β agonist with potential in multiple indications, including hypercholesterolemia, dyslipidemia, NASH, and X-ALD. Under the terms of the agreement with Viking, we may be entitled to up to $375 million of development, regulatory and commercial milestones and tiered royalties on potential future sales including a $10 million payment upon initiation of a Phase 3 clinical trial. Another Metabasis drug development program, RVT-1502, has been outlicensed to Metavant. RVT-1502 is a novel, orally-bioavailable, small molecule, glucagon receptor antagonist or "GRA."

For the first quarter of 2019, we reduced the contingent liabilities associated with Crystal by $1.5 million based on management's estimates of timing and probability of achievement of certain milestones and revenue thresholds. We made a $1.0 million payment to the former shareholders of Crystal during the first quarter of 2018. There was no significant change to the fair value of Crystal and CyDex during the second quarter of 2019 or 2018.

Assets Measured on a Non-Recurring Basis

We apply fair value techniques on a non-recurring basis associated with valuing potential impairment losses related to our goodwill, indefinite-lived intangible assets and long-lived assets.

We evaluate goodwill and indefinite-lived intangible assets annually for impairment and whenever circumstances occur indicating that goodwill might be impaired. We determine the fair value of our reporting unit based on a combination of inputs, including the market capitalization of Ligand, as well as Level 3 inputs such as discounted cash flows, which are not observable from the market, directly or indirectly. We determine the fair value of our indefinite-lived intangible assets using the income approach based on Level 3 inputs.

There were no triggering events identified and no indication of impairment of our goodwill, indefinite-lived intangible assets, or long-lived assets during the six months ended June 30, 2019 and June 30, 2018.

4. Convertible Senior Notes

0.75% Convertible Senior Notes due 2019

In August 2014, we 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 our 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 our 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.

On May 22, 2018, we entered into a supplemental indenture whereby we made an irrevocable election to settle the entire 2019 Notes in cash. As such, we must deliver cash to settle the principal and any premium due upon conversion. As a result of the requirement to deliver cash to settle any premium due upon conversion, on May 22, 2018, we reclassified from equity to liability the conversion option fair value of $341.6 million. In accordance with ASC 815, *Derivatives and Hedging*, 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 statement of operations for the three and six months ended June 30, 2018.

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. We paid 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, we 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.

In July and August 2018, we received notices for conversion of $195.9 million of principal amount of the 2019 Notes which were settled in October and November 2018. We paid the noteholders the $195.9 million principal amount and the excess of conversion value over the principal amount, totaling $439.6 million, in cash.

In June 2019, we received notices for conversion of $1.0 million of principal amount of the 2019 Notes, which will be settled in cash upon the 2019 Notes' maturity date in August 2019.

As of June 30, 2019, the derivative was adjusted to its fair value of $14.3 million with the resulting $4.4 million and $9.1 million decrease reflected in other expense, net, in our condensed consolidated statements of operations for the three and six months ended June 30, 2019, respectively.

Convertible Bond Hedge and Warrant Transactions

In August 2014, we entered into convertible bond hedges and sold warrants covering 3,264,643 shares of our common stock to minimize the impact of potential dilution to our stockholders and/or offset the cash payments we are 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 our 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 us and are not part of the terms of the 2019 Notes. Holders of the 2019 Notes and warrants will not have any rights with respect to the convertible bond hedges. We paid $48.1 million for these convertible bond hedges and recorded the amount as a reduction to additional paid-in capital.

As a result of the irrevocable cash election, conversion notices received relating to the 2019 Notes after May 22, 2018 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. We account for the bond hedge as a derivative asset and marked it to market as of June 30, 2019 at

$14.3 million with the resulting $4.4 million and $8.3 million increase reflected in other expense, net, in our condensed consolidated statements of operations for the three and six months ended June 30, 2019, respectively.

Concurrently with the convertible bond hedge transactions, we entered into warrant transactions whereby we 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. We 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 we do not have the obligation and do not intend to file any registration statement with the SEC registering the issuance of the shares under the warrants. We continue 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. In November 2018, we repurchased a total of 525,000 warrants. As a result, 2,739,643 warrants remained outstanding as of both June 30, 2019 and December 31, 2018.

0.75% Convertible Senior Notes due 2023

In May 2018, we issued $750.0 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 our 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 our 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 our 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.

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, 2019, the “if-converted value” did not exceed the principal amount of the 2023 Notes. In connection with the issuance of the 2023 Notes, we 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 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 our 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, we 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 our common stock and/or offset the cash payments we are 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. We paid $140.3 million for these convertible bond hedges. If upon conversion of the 2023 Notes, the price of our 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 us 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, we entered into warrant transactions whereby we sold warrants covering approximately3,018,327 shares of common stock with an exercise price of approximately $315.38 per share, subject to certain adjustments. We 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 we do not have the obligation and do not intend to file any registration statement with the SEC registering the issuance of the shares under the warrants.

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

	June 30, 2019	December 31, 2018
Principal amount of 2019 Notes outstanding	$ 27,323	$ 27,326
Unamortized discount (including unamortized debt issuance cost)	(236)	(893)
Total current portion of notes payable	$ 27,087	$ 26,433
Principal amount of 2023 Notes outstanding	$ 750,000	$ 750,000
Unamortized discount (including unamortized debt issuance cost)	(125,791)	(140,136)
Total long-term portion of notes payable	$ 624,209	$ 609,864
Fair value of both 2019 Notes and 2023 Notes outstanding (Level 2)	$ 689,172	$ 713,533

5. Income Tax

Our 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, 2019 was 20.0% and 20.9%, respectively. The variance from the U.S. federal statutory tax rate of 21% for the three months ended June 30, 2019 was primarily attributable to the mix of earnings in jurisdictions with lower statutory tax rates than the U.S.. The effective tax rate for the three and six months ended June 30, 2018 was 23.5% and 21.5%, respectively. The variance from the U.S. federal statutory tax rate of 21% for the three months ended June 30, 2018 was primarily attributable to tax deductions related to stock award activities which were recorded as discrete items in the quarter.

6. Stockholders' Equity

We grant 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 our 2018 Annual Report.

The following is a summary of our 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, 2018	1,736,304	$ 66.71	132,273	$ 130.63
Granted	311,884	$ 117.63	98,404	$ 114.15
Options exercised/RSUs vested	(104,249)	$ 23.16	(69,529)	$ 110.87
Balance as of June 30, 2019	1,943,939	$ 77.17	161,148	$ 129.10

As of June 30, 2019, outstanding options to purchase1.3 million shares were exercisable with a weighted average exercise price per share of $55.57.

Employee Stock Purchase Plan

The price at which common stock is purchased under the Amended Employee Stock Purchase Plan, or ESPP, is equal to85% 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, 2019, 60,642 shares were available for future purchases under the ESPP.

7. Commitment and Contingencies Legal Proceedings

We record 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, we record the minimum estimated liability related to the claim in accordance with ASC 450, *Contingencies.* As additional information becomes available, we assess the potential liability related to our pending litigation and revises our estimates. Revisions in our estimates of potential liability could materially impact our 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. On October 1, 2018, we filed a motion to dismiss the plaintiffs' complaint. On May 24, 2019, the Court granted the motion and subsequently entered an order dismissing the action with prejudice. On July 12, 2019, plaintiffs filed a notice of appeal in the Delaware Supreme Court. Plaintiff's opening brief is due August 29, 2019.

In November 2017, CyDex, our wholly-owned subsidiary, received a Paragraph IV certification from Teva stating that Teva had submitted an ANDA to the FDA, seeking approval to manufacture, offer to sell, and sell a generic version of EVOMELA® prior to the expiration of any of U.S. Patent Nos. 8,410,077 ("the '077 patent"); 9,200,088 ("the '088 patent"), or 9,493,582 ("the '582 patent"), and alleging that these patents, each of which relates to Captisol®, are invalid, unenforceable, and/or will not be infringed by Teva's ANDA product. On December 20, 2017, CyDex filed a complaint against Teva in the U.S. District Court for the District of Delaware, asserting that the filing of Teva's ANDA constitutes infringement of each of the '077 patent, the '088 patent, and the '582 patent. 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. On July 24, 2018, the U.S. District Court entered a Scheduling Order setting a trial date for January 2020.

On April 9, 2019, CyDex received a Paragraph IV certification from Alembic Global Holdings SA ("Alembic") stating that Alembic had submitted an ANDA to the FDA, seeking approval to manufacture, offer to sell, and sell a generic version of EVOMELA® prior to the expiration of any of the '077 patent; the '088 patent, the '582 patent, or U.S. Patent No. 10,040,872 ("the '872 patent"), and alleging that these patents, each of which relates to Captisol®, are invalid, unenforceable, and/or would not be infringed by Alembic's ANDA product. On May 23, 2019, CyDex filed a complaint against Alembic, Alembic Pharmaceuticals, Ltd., and Alembic Pharmaceuticals, Inc. in the U.S. District Court for the District of Delaware, asserting that the filing of Alembic's ANDA constitutes infringement of each of the '088 patent and the '582 patent.

8. Leases

We lease certain office facilities and equipment primarily under various operating leases. Our leases have remaining contractual terms up toseven years, some of which include options to extend the leases for up to seven years. Our lease agreements do not contain any material residual value guarantees, material restrictive covenants, or material termination options. Our operating lease costs are primarily related to facility leases for administration offices and research and development facilities, and our finance leases are immaterial.

Lease assets and lease liabilities are recognized at the commencement of an arrangement where it is determined at inception that a lease exists. Lease assets represent the right to use an underlying asset for the lease term, and lease liabilities represent the obligation to make lease payments arising from the lease. These assets and liabilities are initially recognized based on the present value of lease payments over the lease term calculated using our incremental borrowing rate generally applicable to the location of the lease asset, unless the implicit rate is readily determinable. Lease assets also include any upfront lease payments made and lease incentives. Lease terms include options to extend or terminate the lease when it is reasonably certain that those options will be exercised.

Variable lease payments are generally expensed as incurred, include certain index-based changes in rent, and exclude certain nonlease components, such as maintenance and other services provided by the lessor, and other charges included in the lease. Leases with an initial term of 12 months or less are not recorded on the balance sheet, and the expense for these short-term leases and for operating leases is recognized on a straight-line basis over the lease term.

The depreciable life of lease assets and leasehold improvements is limited by the expected lease term, unless there is a transfer of title or purchase option reasonably certain of exercise.

Operating Lease Assets and Liabilities (in thousands):

		June 30, 2019	Balance Sheet Classification
Lease assets	$	10,964	Operating lease right-of-use assets
Current lease liabilities	$	(989)	Accrued liabilities
Non-current lease liabilities		(10,489)	Long-term operating lease liabilities
Total lease liabilities	$	(11,478)	

During the three months ended June 30, 2019, we entered into several new lease agreements including our San Diego headquarter expansion and a new UK office lease, which resulted an increase in lease assets and liabilities of $6.1 million and $6.0 million, respectively, during the quarter.

Maturity of Operating Lease Liabilities (in thousands):

Maturity Dates		June 30, 2019
Remaining six months ending December 31, 2019	$	785
2020		1,880
2021		2,175
2022		2,214
2023		1,939
Thereafter		5,349
Total lease payments		14,342
Less imputed interest		(2,864)
Present value of lease liabilities	$	11,478

As of June 30, 2019, our operating leases have a weighted-average remaining lease term of7 years and a weighted-average discount rate of6%. Cash paid for amounts included in the measurement of operating lease liabilities was $0.5 million and $1.1 million, for the three and six months ended June 30, 2019, respectively. Operating lease expense was $0.5 million (net of sublease income of $0.3 million) and $1.1 million (net of sublease income of $0.6 million) , for the three and six months ended June 30, 2019, respectively.

9. Subsequent Event

On July 23, 2019, we acquired privately-held Ab Initio Biotherapeutics, Inc., an antigen-discovery company located in South San Francisco, California. We paid approximately $12.0 million for the acquisition.

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 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 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. We employ research technologies such as antibody discovery technologies, structure-based drug design, formulation science and liver targeted pro-drug technologies to assist companies in their work toward securing prescription drug approvals. We currently have partnerships and license agreements with over 110 pharmaceutical and biotechnology companies. Over 200 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 cancer, seizure, diabetes, cardiovascular disease, muscle wasting, liver disease, and kidney disease, among others. We have over 1,200 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, which we refer to as "shots on goal," 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 and then seek partners to continue development and potential commercialization.

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

OmniAb Platform Updates

Acquisition and New Licenses

- We announced the acquisition of Ab Initio for $12 million in cash. Ab Initio is a privately held antigen-discovery company based in South San Francisco, CaliforniaAb Initio brings to us a patented antigen technology that is synergistic with our OmniAb therapeutic antibody discovery platform. This new technology will help provide our current and potential new partners enhanced capabilities for the discovery of therapeutic antibodies against difficult-to-access cellular targets. In addition, Ab Initio has a collaboration agreement with Pfizer Inc. to discover novel therapeutic antibodies against an undisclosed target in the GPCR superfamily. GPCRs comprise the largest class of therapeutic drug targets, with key regulatory roles ranging from cardiovascular biology to metabolic health. Under the agreement, we are eligible to receive potential milestones and tiered royalties on potential future sales. Ab Initio also currently has two unpartnered preclinical programs focused on hematological malignancies and solid tumors.
- We entered into an OmniAb license agreement with Millennium, a wholly owned subsidiary of Takeda. Under the license, Takeda and its affiliates will be able to use OmniAb® platform rodents and chickens in campaigns to discover fully human mono- and bispecific antibodies, as well as therapies using engineered cells and OmniAb-derived binders.
- We entered into an OmniAb license agreement with GigaGen, a South San Francisco-based biotherapeutics company, under which GigaGen will be able to use OmniAb platform rodents and chickens to discover fully human mono- and bispecific-antibodies.

Partner Updates

- CStone Pharmaceuticals announced dosing of the first patient in a Phase 3 clinical trial assessing OmniAb-derived CS1001 in combination with chemotherapy for the treatment of gastric adenocarcinoma or gastro-esophageal junction adenocarcinoma.
- CStone Pharmaceuticals announced the company has entered into a collaboration with Bayer to evaluate CS1001 in combination with Bayer's regorafenib as a treatment for multiple cancers including gastric cancer.
- OmniAb-derived DuoBody-PD-L1x4-1BB was highlighted in GenMab's U.S. IPO Form S-1 filing and on clintrials.gov.
- Immunovant, Inc. announced presentation of detailed findings in healthy subjects for IMVT-1401 (formerly RVT-1401) in a poster session at the 2019 American Academy of Neurology Annual Meeting and initiated dosing in ASCEND-GO 1, an open-label, single-arm Phase 2a clinical trial evaluating IMVT-1401 in patients with moderate-to-severe active Graves' ophthalmopathy.
- Aptevo Therapeutics Inc. provided an update on OmniAb-derived APVO436 and announced that Phase 1 data is anticipated in the fourth quarter of 2019. New preclinical data for APVO436 was also presented at the American Association for Cancer Research (AACR) 2019 Annual Meeting.
- OmniAb partner xCella Biosciences presented high-throughput functional screening of antibody libraries, highlighting OmniRat and OmniChicken, at the 2019 PEGS.

Publications and Presentations

- At PEGS 2019, our scientists announced the launch of OmniClic™, a novel next-generation common light chain OmniChicken-based antibody discovery technology focused on bispecific antibodies.
- We highlighted OmniChicken in a presentation titled "High Throughput SPR Demonstrates that V-lambda Expressing OmniChickens™ Exhibit Broad Epitope Coverage and Picomolar Affinity" and highlighted OmniClic in a presentation titled "Fixed Light Chain Transgenic Chicken for Bispecific Antibody Discovery" at Antibody Engineering and Therapeutics-Europe conference.

Other Licensing and Acquisition Events

- We announced the acquisition of economic rights to SB206 from Novan. SB206 is a Phase 3 topical antiviral gel for the treatment of skin infections, including molluscum contagiosum. We paid $12 million to Novan and in return is entitled to receive a tiered royalty of 7% to 10%, as well as up to $20 million in regulatory and commercial milestones.
- We entered a worldwide license agreement granting Cumulus exclusive rights to develop and commercialize VER250840, a novel, oral, selective, preclinical Chk1 Kinase Inhibitor discovered using our VDP. We received an upfront license fee and are eligible to receive more than $76 million of milestone payments, as well as tiered royalties in the mid-to-high single digits and an additional fee based on Cumulus achieving specified financing-related events.

- We entered an exclusive commercial license and supply agreement with SQ Innovation AG for use of our Captisol technology in the formulation of high-concentration furosemide for the treatment of edema in patients with heart failure. We are eligible to receive potential milestone payments and royalties, as well as revenue from materials sales of Captisol.
- We entered a VDP research collaboration agreement with PhoreMost, a private UK-based biotech, on an undisclosed novel oncology target. Ligand and PhoreMost will share revenues from any future out-licenses. Based on our contribution and stage of development at the time of licensing, we will be entitled to a scaling interest in license economics.
- We recently entered into new Captisol clinical use or commercial license and supply agreements with Millennium/Takeda, Bexon Biomedical, Valanbio Therapeutics and BendaRx Corporation.

Additional Pipeline and Partner Developments

- Sage Therapeutics launched ZULRESSO™ (brexanolone) injection. With this launch, ZULRESSO is the 11th U.S. FDA-approved drug to use our patented Captisol technology.
- Novan announced that the company had exceeded 50% of expected patient enrollment in the company's ongoing "B-SIMPLE" Phase 3 program evaluating topical nitric oxide product candidate SB206 for the treatment of molluscum contagiosum.
- Viking presented new results from the company's 12-week Phase 2 study of VK2809 in patients with non-alcoholic fatty liver disease and elevated low-density lipoprotein cholesterol at the International Liver Congress 2019.
- Metavant has been working with FDA to determine a path forward for the glucagon receptor antagonist or GRA program now known as RVT-1502 in diabetes. We believe that continued development of RVT-1502 for diabetes in the U.S. is highly unlikely based on preclinical and clinical trials now required by FDA for any drug in the GRA class intended for long-term use. Metavant may choose to explore certain other indications and/or geographies for RVT-1502 and expects to make a decision later this year.
- Sermonix Pharmaceuticals announced that lasofoxifene has been granted Fast Track designation by the FDA and presented a poster on the preclinical performance of its lead investigational drug, lasofoxifene, at the 2019 American Society of Clinical Oncology (ASCO) Annual Meeting.
- Daiichi Sankyo announced the launch in Japan of MINNEBRC® (esaxerenone) tablets.
- Melinta Therapeutics announced the FDA has accepted a sNDA for BAXDELA® (delafloxacin) for priority review. The sNDA filing seeks to expand the current indication for BAXDELA to include adult patients with community-acquired bacterial pneumonia.
- Verona Pharma announced the initiation of a Phase 2b dose-ranging study evaluating nebulized ensifentrine (RPL554) added on to a long-acting bronchodilator in patients with moderate-to-severe COPD and also presented clinically relevant findings from its COPD clinical trial program with ensifentrine at the American Thoracic Society International Conference.
- Nucorion Pharmaceuticals announced the closing of a $5 million Series B Preferred Stock financing to support the Phase 1 clinical development in the US for its lead program, NCO-1010 for the potential treatment of hepatitis B, which utilizes our LTP Platform™ technology.

Internal R&D

- We announced positive top-line results from a Phase 1 clinical trial of its internal CE-Iohexol program. The trial achieved the primary endpoint by demonstrating pharmacokinetic bioequivalence of CE-Iohexol injection and a reference Iohexol injection (OMNIPAQUE™) after intravenous (IV) administration in healthy adults. CE-Iohexol injection was safe and well tolerated, and adverse events were in line with the known safety profile of OMNIPAQUE.

Results of Operations

Revenue

(Dollars in thousands)	Q2 2019	Q2 2018	Change	% Change	YTD 2019	YTD 2018	Change	% Change
Royalties	**$ 6,626**	$ 31,396	$ (24,770)	(79) %	**$ 26,164**	$ 52,216	$ (26,052)	(50) %
Material sales	**8,549**	7,612	937	12 %	**17,508**	12,003	5,505	46 %
License fees, milestones and other revenue	**9,812**	51,035	(41,223)	(81) %	**24,799**	81,981	(57,182)	(70) %
Total revenue	**$ 24,987**	$ 90,043	$ (65,056)	(72) %	**$ 68,471**	$ 146,200	$ (77,729)	(53) %

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%. On March 6, 2019, we sold all of our rights, title and interest in and to the Promacta license to RPI; therefore, the royalty revenue for Promacta only reflected the revenue prior to the sale. Subsequent to March 6, 2019, we no longer recognize revenue related to Promacta. See *Note 2 - Sale of Promacta License.*

The following tables represent royalty revenue by program:

(in millions)	Q2 2019 Estimated Partner Product Sales	Effective Royalty Rate	Q2 2019 Royalty Revenue	Q2 2018 Partner Product Sales	Effective Royalty Rate	Q2 2018 Royalty Revenue
Promacta	**N/A**	**N/A**	**N/A**	$ 292.0	8.5 %	$ 24.8
Kyprolis	**$ 252.0**	**1.9 %**	**$ 4.9**	275.0	1.7 %	4.7
Evomela	**5.7**	**20.0 %**	**1.1**	5.8	20.0 %	1.2
Other	**44.2**	**1.4 %**	**0.6**	43.4	1.6 %	0.7
Total	**$ 301.9**		**$ 6.6**	$ 616.2		$ 31.4

(in millions)	YTD 2019 Estimated Partner Product Sales	Effective Royalty Rate	YTD 2019 Royalty Revenue	YTD 2018 Partner Product Sales	Effective Royalty Rate	YTD 2018 Royalty Revenue
Promacta [1]	**$ 225.1**	**6.3 %**	**$ 14.2**	$ 549.0	7.4 %	$ 40.4
Kyprolis	**499.0**	**1.7 %**	**8.7**	509.0	1.6 %	8.1
Evomela	**10.2**	**20.0 %**	**2.0**	13.8	20.0 %	2.8
Other	**92.1**	**1.3 %**	**1.2**	85.4	1.1 %	0.9
Total	**$ 826.4**		**$ 26.1**	$ 1,157.2		$ 52.2

(1) Promacta YTD 2019 estimated partner product sales represent the pro-rated estimated sales prior to the Promacta sale on March 6, 2019.

Q2 2019 vs. Q2 2018

Total revenue decreased by $65.0 million, or 72%, to $25.0 million in Q2 2019 compared to $90.0 million in Q2 2018 due to the sale of Promacta in the first quarter of 2019 and a $47.0 million OmniAB platform license fee received from WuXi during the second quarter of 2018.

YTD 2019 vs. YTD 2018

Total revenue decreased by $77.7 million, or 53%, to $68.5 million in the first half of 2019 compared to $146.2 million in the same period in 2018 due to $20.0 million received from Roivant upon entering into the GRA license agreement and a $47.0 million OmniAb platform license fee received from WuXi during the first half of 2018 as well as the sale of Promacta in the first quarter of 2019, partially offset by increased material sales during the first half of 2019 primarily related to timing of customer purchases of Captisol for use in clinical trials and in commercialized products.

Operating Costs and Expenses

(Dollars in thousands)	Q2 2019	% of Revenue	Q2 2018	% of Revenue	YTD 2019	% of Revenue	YTD 2018	% of Revenue
Costs of material sales	**$ 2,405**		$ 1,134		6,263		1,922	
Amortization of intangibles	**3,505**		3,305		7,008		6,584	
Research and development	**12,213**		6,135		23,502		13,540	
General and administrative	**10,994**		9,294		22,082		16,938	
Total operating costs and expenses	**$ 29,117**	117%	$ 19,868	22%	**$ 58,855**	86%	$ 38,984	27%

Q2 2019 vs. Q2 2018

Total operating costs and expenses as a percentage of total revenue increased in Q2 2019 compared to Q2 2018. Total operating costs and expenses increased by $9.2 million or 47%. Cost of material sales increased primarily due to higher material sales as a result of timing of customer purchase. Research and development expenses increased due to timing of internal development costs, the Vernalis acquisition, and amortization of other economic rights during the three months ended June 30, 2019. General and administrative expenses increased primarily due to the Vernalis acquisition and an increase in share-based compensation.

YTD 2019 vs. YTD 2018

Total operating costs and expenses as a percentage of total revenue increased in first half of 2019 compared to the same period in 2018. Total operating costs and expenses increased by $19.9 million or 51%. Cost of material sales increased primarily due to higher material sales as a result of timing of customer purchases. Research and development expenses increased due to timing of internal development costs, the Vernalis acquisition, and amortization of other economic rights during the six months ended June 30, 2019. General and administrative expenses increased primarily due to the Vernalis acquisition.

Other Income (Expense)

(Dollars in thousands)	Q2 2019	Q2 2018	Change	YTD 2019	YTD 2018	Change
Gain (loss) from Viking	**$ (12,365)**	$ 39,963	$ (52,328)	**$ 4,928**	$ 61,808	$ (56,880)
Interest income	**9,285**	2,762	6,523	**15,194**	3,637	11,557
Interest expense	**(9,012)**	(13,454)	4,442	**(17,918)**	(16,933)	(985)
Other expense, net	**(1,806)**	(3,867)	2,061	**68**	(4,835)	4,903
Total other income (expense), net	**$ (13,898)**	$ 25,404	$ (39,302)	**$ 2,272**	$ 43,677	$ (41,405)

The fluctuation in the gain (loss) from Viking common stock and warrants are driven by the changes in the fair value of the Viking common stock and warrants.

Interest income consists primarily of short-term investment transactions and the change in the fair market value of our investments. The increase over the prior period presented is due to the increase in our short-term investment balance as a result of the proceeds from the 2023 Notes financing on May 22, 2018 and the proceeds from the sale of Promacta license in March 2019.

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 for the three and six months ended June 30, 2019. The quarter over quarter decrease is primarily due to lower average debt outstanding balance for the three months ended June 30, 2019 as compared to prior period. The year over year increase is primarily due to the issuance of the 2023 Notes in May 2018. See *Note 4 - Convertible Senior Notes.*

Other expense, net, for the three and six months ended June 30, 2019 decreased as compared to the prior periods. The quarter over quarter decrease is primarily due to a $2.6 million unrealized gain in equity investments and the decrease in the fair value adjustment of contingent liabilities associated with our Metabasis acquisition during the three months ended June 30, 2019. The year over year decrease is primarily due to a $1.5 million decrease in fair value of contingent liabilities associated with our Crystal acquisition based on management's estimates of timing and probability of achievement of certain milestones and revenue thresholds, decrease in the fair value adjustment of contingent liabilities associated with our Metabasis acquisition and net decrease in our derivative instrument expense associated with our convertible notes and hedge transactions during the six months ended June 30, 2019. See *Note 4 - Convertible Senior Notes.*

Income Tax Benefit (Expense)

(Dollars in thousands)	Q2 2019	Q2 2018	Change	YTD 2019	YTD 2018	Change
Income (loss) before income taxes	**$ (18,028)**	$ 95,579	$ (113,607)	**$ 824,685**	$ 150,893	$ 673,792
Income tax benefit (expense)	**3,609**	(22,419)	26,028	**(172,767)**	(32,452)	(140,315)
Income (loss) from operations	**$ (14,419)**	$ 73,160	$ (87,579)	**$ 651,918**	$ 118,441	$ 533,477
Effective tax rate	20.0 %	23.5 %		20.9 %	21.5 %	

We compute our income tax provision by applying the estimated annual effective tax rate to income from operations and adding the effects of any discrete income tax items specific to the period. Our effective tax rate for the three and six months

ended June 30, 2019 was approximately 20.0% and 20.9%, respectively. The variance from the U.S. federal statutory tax rate of 21% for the three and six months ended June 30, 2019 was primarily attributable to the mix of earnings in jurisdictions with lower statutory tax rates than the U.S. and tax deductions related to stock award activities which were recorded as discrete items. Our effective tax rate for the three and six months ended June 30, 2018 was approximately 23.5% and 21.5%, respectively. The variance from the U.S. federal statutory tax rate of 21% for the three and six months ended June 30, 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 during the first quarter of 2018.

Liquidity and Capital Resources

As of June 30, 2019, our cash, cash equivalents, and marketable securities totaled $1.4 billion, which were increased by $618.6 million from the end of last year, due to factors described in the "Cash Flow Summary" below. Our primary source of liquidity, other than our holdings of cash, cash equivalents, and investments, which increased during 2019 primarily from the sale of Promacta, has been cash flows from operations. Our ability to generate cash from operations provides us with the financial flexibility we need to meet operating, investing, and financing needs.

Historically, we have liquidated our short-term investments and/or issued debt and equity securities to finance our business needs as a supplement to cash provided by operating activities. As of June 30, 2019, we had $1.1 billion in short-term investments. Our short-term investments include U.S. government debt securities, investment-grade corporate debt securities and certificates of deposit. We have established guidelines relative to diversification and maturities of our investments in order to provide both safety and liquidity. These guidelines are periodically reviewed and modified to take advantage of trends in yields and interest rates. Additionally, we own certain securities which are classified as short-term investments that we received as a result of a milestone and an upfront license payment as well as 6.0 million shares of common stock in Viking.

In August 2014, we issued an aggregate principal amount of $245.0 million of the 2019 Notes. During 2018, $217.7 million in principal of the 2019 Notes were converted and $27.3 million in principal remained outstanding as of June 30, 2019, which will be paid off in cash upon the due date.

In May 2018, we issued an aggregate principal amount of $750.0 million of the 2023 Notes. A portion of the proceeds from such issuance totaling $49.7 million were used to repurchase 260,000 shares of our common stock. The 2023 Notes were not convertible as of June 30, 2019. It is our 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.

In September 2018, 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. On January 23, 2019, our Board of Directors increased the share repurchase authorization by $150.0 million. The repurchases may be completed under a 10b5-1 plan or at management's discretion. Authorization to repurchase $90 million of our common stock remained available as of June 30, 2019. From June 30, 2019 through August 7, 2019, we acquired 378,746 additional shares, and the maximum dollar value of shares that may yet be purchased under the repurchase program was approximately $37.9 million.

We anticipate that our current cash, cash equivalents, and short-term investments, together with cash provided by operating activities are sufficient to fund our near term capital and operating needs for at least the next 12 months. Operating needs include the planned costs to operate our business, including amounts required to fund working capital and capital expenditures. Our primary short-term needs for capital, which are subject to change, include:

- potential early repayment of debt obligations as a result of conversions;
- repurchases of our outstanding common stock;
- the continued advancement of research and development efforts;
- potential strategic acquisitions and investments; and
- the expansion needs of our facilities, including costs of leasing additional facilities.

As of June 30, 2019, we had $13.1 million in fair value of contingent consideration liabilities associated with prior acquisitions to be settled in future periods.

Leases and Off-Balance Sheet Arrangements

We lease our office facilities under operating lease arrangements with varying terms through September 2026. The agreements provide for increases in annual rents based on changes in the Consumer Price Index or fixed percentage increases of 3.0%. See further information in *Note 8, Leases.* We had no off-balance sheet arrangements at June 30, 2019 and December 31, 2018.

Cash Flow Summary

(Dollars in thousands)	YTD 2019	YTD 2018
Net cash provided by (used in):		
Operating activities	$ (15,800)	$ 134,405
Investing activities	360,580	(620,319)
Financing activities	(190,167)	616,753

During the six months ended June 30, 2019, we generated $827 million from the sale of Promacta, used cash for net purchases of short-term investments, used $189.9 million to repurchase our common stock, used $69.7 million to pay federal and state estimated income taxes and paid $12 million for the purchase of Novan economic rights. During the six months ended June 30, 2018, we generated cash from operations, from issuance of common stock under employee stock plans, and from issuance of 2023 Notes, partially offset by cash used for net purchases of short-term investments and $52.7 million used to repurchase our common stock.

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. There have been no material changes in our critical accounting policies and estimates other than the adoption of the Accounting Standards Updates described in Item 1. Condensed Consolidated Financial Statements - Note 1, "Basis of Presentation and Summary of Significant Accounting Policies," as compared to the critical accounting policies and estimates described in our 2018 Annual Report.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

There were no substantial changes to our market risks in the three and six months ended June 30, 2019, when compared to the disclosures in Item 7A of our 2018 Annual Report.

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

For information that updates the disclosures set forth under Part I, Item 3, "Legal Proceedings" in our 2018 Annual Report, refer to *Note 7, Commitment and Contingencies: Legal Proceedings*, to the Condensed Consolidated Financial Statements contained in Part I, Item 1 of this report.

Item 1A. Risk Factors

There have been no material changes to the risk factors included in "Item 1A. Risk Factors" in our 2018 Annual Report, other than as set forth below:

Our investments are subject to market and credit risks that could diminish their value and these risks could be greater during periods of extreme volatility or disruption in the financial and credit markets, which could adversely impact our business, financial condition, results of operations, liquidity and cash flows.

Our investments are subject to risks of credit defaults and changes in market values. Periods of macroeconomic weakness or recession, heightened volatility or disruption in the financial and credit markets could increase these risks, potentially resulting in other than temporary impairment of assets in our investment portfolio. Any event reducing the estimated fair value of these securities, other than on a temporary basis, could have a material and adverse effect on our business, results of operations, financial condition, liquidity and cash flows. If our investment manager, fails to react appropriately to difficult market, economic and geopolitical conditions, our investment portfolio could incur material losses.

We have a risk management framework in place to identify, assess and prioritize risks, including the market and credit risks to which our investments are subject. As part of that framework, we test our investment portfolio based on various market scenarios. Under certain stressed market scenarios, unrealized losses on our investment portfolio could lead to material reductions in its carrying value.

A decline in fair value below the amortized cost of a security requires management to assess whether an other-than-temporary impairment (OTTI) has occurred. The decision on whether to record an OTTI is determined in part by our assessment of the financial condition and prospects of a particular issuer, projections of future cash flows and recoverability of the particular security as well as management's assertion of whether it is more likely than not that we will sell the particular security before recovery.

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

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 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.

We rely heavily on collaboration relationships, and any disputes or litigation with our collaboration 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 strategy for developing and commercializing many of our potential products, including products aimed at larger markets, includes entering into collaboration agreements with corporate partners and others. These agreements give our collaboration partners significant discretion when deciding whether or not to pursue any development program. Our existing collaborations may not continue or be successful, and we may be unable to enter into future collaboration arrangements to develop and commercialize our unpartnered assets.

In addition, our collaborators may develop drugs, either alone or with others that compete with the types of drugs they are developing with us (or that we are developing on our own). This would result in increased competition for our or our partners' programs. If products are approved for marketing under our collaboration programs, revenues we receive will depend on the manufacturing, marketing and sales efforts of our collaboration partners, who generally retain commercialization rights under the collaboration agreements. Generally, our current collaboration partners also have the right to terminate their collaborations at will or under specified circumstances. If any of our collaboration partners breach (for example, by not making required payments when due, or at all) or terminate their agreements with us or otherwise fail to conduct their collaboration activities successfully, 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. Such disputes or litigation could adversely affect our rights to one or more of our product candidates. Any such dispute or litigation could delay, interrupt or terminate the collaboration research, development and commercialization of certain potential products, create uncertainty as to ownership rights of intellectual property, or could result in litigation or arbitration. The occurrence of any of these problems could be time-consuming and expensive and could adversely affect our business.

Our collaboration partners may change their strategy or the focus of their development and commercialization efforts with respect to our partnered programs, and the success of our partnered programs could be adversely affected.

If our collaboration partners terminate their collaborations with us or do not commit sufficient resources to the development, manufacture, marketing or distribution of our partnered programs, we could be required to devote additional resources to our partnered programs, seek new collaboration partners or abandon such partnered programs, all of which could have an adverse effect on our business. For example, several of our collaboration partners using our OmniAb antibody platform have terminated their contracts or substantially reduced their investment in the antibodies discovered based on the platform. Although we expect growth in the net number of partners with one more active programs based on antibodies discovered using our OmniAb platform, there can be no assurance that our partners will continue their programs or that we will be able to find new collaboration partners interested in discovering antibodies based on our OmniAb platform.

Our OmniAb antibody platform faces specific risks, including the fact that no drug using antibodies from the platform has been approved by the FDA or similar regulatory agency.

None of our collaboration partners using our OmniAb antibody platform have received approval from the FDA or similar regulatory agency to market a product discovered based on our platform. In addition, only a few of our collaboration partners' product candidates based on the platform have been tested in late stage clinical trials. 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 such failure is 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 five patents within the U.S. and three patents in the European Union and are subject to the same risks as our patent portfolio discussed elsewhere, including the risk that our patents may infringe on third party patent rights or that our patents may be invalidated. As of a result of these factors, the future revenue generated from this platform may be materially lower than what we currently anticipate. 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.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

None.

Item 3. Defaults Upon Senior Securities

None.

em 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

Item 6. Exhibits

Exhibit Number	Description
10.1	Addendum, dated May 22, 2019, by and among Ligand Pharmaceuticals Incorporated, CyDex Pharmaceuticals, Inc. and Acrotech Biopharma LLC (as successor-in-interest to Spectrum Pharmaceuticals, Inc.), to that certain License Agreement between Ligand Pharmaceuticals Incorporated and Spectrum Pharmaceuticals, Inc., dated March 8, 2013.*†
10.2	2002 Stock Incentive Plan (as amended and restated effective June 6, 2019) (incorporated by reference to Appendix A to the Company's definitive proxy statement for the 2019 Annual Meeting of Stockholders filed with the Securities and Exchange Commission on April 24, 2019).
10.3	2002 Employee Stock Purchase Plan (as amended and restated effective June 6, 2019) (incorporated by reference to Appendix B to the Company's definitive proxy statement for the 2019 Annual Meeting of Stockholders filed with the Securities and Exchange Commission on April 24, 2019).
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.*
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	The following financial information from our Quarterly Report on Form 10-Q for the quarter ended June 30, 2019, formatted in iXBRL (inline eXtensible Business Reporting Language): (i) Consolidated Condensed Balance Sheets, (ii) Consolidated Condensed Statements of Operations, (iii) Consolidated Condensed Statement of Comprehensive Income, (iv) Consolidated Condensed Statements of Stockholders' Equity, (v) Consolidated Condensed Statements of Cash Flows, and (vi) the Notes to Consolidated Condensed Financial Statements.*
104	The cover page from the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019, formatted in Inline XBRL and contained in Exhibit 101.

* Filed herewith.
† Portions of this exhibit have been omitted for confidentiality purposes.

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, 2019

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

CERTAIN CONFIDENTIAL INFORMATION CONTAINED IN THIS DOCUMENT, MARKED BY [***], HAS BEEN OMITTED BECAUSE LIGAND PHARMACEUTICALS INCORPORATED HAS DETERMINED THE INFORMATION (I) IS NOT MATERIAL AND (II) WOULD LIKELY CAUSE COMPETITIVE HARM TO LIGAND PHARMACEUTICALS INCORPORATED IF PUBLICLY DISCLOSED.

ADDENDUM TO LICENSE AGREEMENT

This Addendum to License Agreement ("Addendum") is entered into by and between, on the one hand, Ligand Pharmaceuticals, Inc. and CyDex Pharmaceuticals, Inc. (collectively "Ligand") and, on the other hand, Acrotech Biopharma LLC ("Acrotech"). Ligand and Acrotech shall each be referred to individually as a "Party" and collectively as "the Parties."

WHEREAS, CyDex Pharmaceuticals, Inc. and Spectrum Pharmaceuticals, Inc. ("Spectrum") entered into a License Agreement dated March 8, 2013, which is attached as Exhibit 1 ("2013 License");

WHEREAS, Ligand owns U.S. Patent Nos. 8,410,077 (the "'077 Patent") and 9,200,088 ("the "'088 Patent"), both entitled "Sulfoalkyl Ether Cyclodextrin Compositions"; U.S. Patent No. 9,493,582 (the "'582 Patent") and U.S. Patent No. 10,040,872 (the "872 Patent"), both entitled "Alkylated Cyclodextrin Compositions and Processes for Preparing and Using the Same";

WHEREAS, each of the '077 Patent, the '088 Patent, the '582 Patent, and the '872 Patent (collectively, the "BCD Patents") is a Captisol Patent within the meaning of 2013 License, and relates to formulations that include β-Cyclodextrin;

WHEREAS, under the 2013 License, Ligand granted certain rights and licenses to Spectrum in the BCD Patents;

WHEREAS, Acrotech Biopharma LLC is Spectrum's successor-in-interest in the 2013 License;

WHEREAS, the BCD Patents are presently listed in FDA's Orange Book as covering Acrotech's Evomela® Melphalan Hydrochloride injection product ("Evomela®");

WHEREAS, [***];

WHEREAS, [***];

WHEREAS, [***];

WHEREAS, [***];

WHEREAS, [***];

WHEREAS, the Parties agree to amend the 2013 License under the terms and conditions herein to accommodate [***];

NOW, THEREFORE, in consideration of the good and valuable consideration, the exchange, receipt, and sufficiency of which are acknowledged, the Parties agree as follows:

1. Except as expressly set forth herein, the terms and conditions of the 2013 License shall remain in full force and effect. In the event of any conflict between the terms and conditions of this Addendum and the 2013 License, the terms and conditions set forth in this Addendum shall control.

2. Section 12.2 of the 2013 License is amended by adding the following provisions 3 and 4 (including definitions of defined terms, as necessary):

3. With respect to [***], the Parties agree as follows:

    a. [***];

    b. Notwithstanding the obligations of this provision and any other obligation provided for in this Agreement, [***];

    c. [***];

    d. [***]:

[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]
[***]	[***]	[***]

    e. [***];

    f. [***]; and

    g. [***].

4. [***]:

    a. [***];

    b. [***];

    c. [***];

d. [***];

e. [***];

f. [***];

g. [***];

h. [***]; and

i. [***].

5. Unless explicitly stated, nothing in this Addendum shall be construed to modify or otherwise affect any rights, obligations, or agreements between the Parties, including but not limited to any rights, obligations, or agreements related to the 2013 License, which Ligand believes specifically includes [***].

6. The Parties acknowledge that neither Party has made any promise, representation, or warranty, whether express or implied, not specifically contained herein concerning the subject matter of this Agreement to induce the other Party to execute this Agreement. Further, the Parties acknowledge that they have not executed this Agreement in reliance on any such promise, representation, or warranty not expressly set forth in this Agreement.

7. This Agreement constitutes the entire agreement among the Parties regarding the subject matter herein and may not be modified, amended, or supplemented without a writing signed by or on behalf of all Parties.

8. This Addendum shall be binding on the Parties, their officers, directors, members, employees, and their respective successors and assigns.

9. Any party signing this Addendum on behalf of a Party represents that it has authority from the Party to execute this Agreement, that it has fully informed the Party of the terms of this Addendum, and that the Party has agreed to be bound by all the terms of this Addendum. This Addendum may be executed in identical counterparts, including signatures scanned and sent by electronic mail, by completing the attached Acknowledgement.

10. The existence and terms of this Addendum (and any drafts thereof) are confidential and shall not be disclosed to any person or entity other than the Parties hereto and their counsel without the prior written consent of each of the Parties. Furthermore, the fact that the Parties intend to [***] is also confidential and shall not be disclosed to any other person or entity other than the Parties hereto and their counsel without the prior consent of each of the Parties. Notwithstanding the foregoing, a Party may disclose this Addendum if compelled to do so by Court order or other binding legal process, but only after notifying the other Party and giving them an opportunity to be heard on the matter before the relevant Court, tribunal, agency or other body.

11. In the event that any of the provisions or terms of this Addendum are held to be unenforceable or invalid by any mediator, arbitrator, or court of competent jurisdiction, the validity and enforceability of the remaining provisions or terms shall not be affected and shall remain in full force and effect.

12.

ACROTECH BIOPHARMA LLC

/s/ Hunter Murdock

Name: Hunter Murdock

Title: VP & General Counsel

Date: 5/22/19

LIGAND PHARMACEUTICALS, INC.

and

CYDEX PHAMACEUTICALS, INC.

/s/ Charles Berkman

Name: Charles S. Berkman

Title: Sr. Vice President, General Counsel and Secretary

Date: 5/22/2019

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.

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

Date: August 8, 2019

/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.

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

Date: August 8, 2019

/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, 2019, 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, 2019

/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, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Matthew Korenberg, Executive 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, 2019

/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.