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Ligand Provides Highlights from Today's Analyst Day Event

Webcast available at www.ligand.com

SAN DIEGO--(BUSINESS WIRE)-- At an Analyst Day event held today in New York City, **Ligand Pharmaceuticals Incorporated (NASDAQ: LGND)** reviewed the recent progress of its business and financial growth outlook. Management provided additional details on its 2019 financial guidance and a preliminary financial outlook for 2020, discussed its technology platforms, including the opportunity and importance of its OmniAb technology platform.

Highlights of the event's presentations include the following:

Business model and growth drivers:

- Management provided an overview of Ligand's business model and diversification of its portfolio. Ligand leverages its diversification with Shots on Goal, which are programs fully-funded by partners and backed by Ligand's patents, know-how and/or data. These Shots on Goal provide economics to Ligand on program success without the associated spend.
- Ligand has increased its Shots-on-Goal portfolio to more than 200 programs, with four technology platforms and more than $3.5 billion in potential contract payments from partners. Ligand has more than 1,200 patents issued worldwide and more than $1.4 billion in cash currently on its balance sheet.
    - Today's presentation included slides that breakout the $3.5 billion in potential contract payments by technology, by product stage of development and by partner. The presentation also included an analysis of the over 200 Shots on Goal by technology, by stage of development and by type of partner.
- Ligand expects its revenue and diluted EPS to grow at a compound annual growth rate (CAGR) in the mid-teens percentages for the next five to 10 years.
- Ligand has 112 employees, including 45 with a Ph.D. degree and 88 in R&D, with an average tenure at the company of 10 years. These employees work from facilities in San Diego and Emeryville, California, Lawrence, Kansas and Cambridge, England.
- Major assets reviewed at the Analyst Day event include VK-2809 (Viking Therapeutics), ZULRESSO™ (Sage Therapeutics), Sparsentan (Retrophin), Captisol-enabled-Iohexol (internal), RVT-1502 (Metavant) and expanded use for the marketed drug Kyprolis® (Amgen and Ono Pharmaceuticals), which uses Ligand's Captisol technology in its formulation.

- Management outlined Ligand's "RPT" (Revenue, Pipeline, Technology) foundation of value, and highlighted 2016 to 2020 projected CAGRs of 30% for royalties (excluding royalties from Promacta), 7% for material sales and 17% for contract payments.

OmniAb technology:

- OmniAb is a best-in-class technology and is Ligand's most valuable business unit, with a current estimated standalone valuation estimated as $2 billion to $2.5 billion based on various internal analyses.
    - OmniAb currently includes four animal platforms and three species, with an expected launch in 2019 of OmniClic™, a common light chain OmniChicken for the discovery of bispecific antibodies.
- Ligand estimates that more than 400 antibody campaigns have been initiated by OmniAb partners, and that its partners will spend approximately $500 million over the next 12 months advancing OmniAb-based programs.
- Today there are 12 OmniAb programs in the clinic, and Ligand projects there will be more than 30 programs using OmniAb-discovered antibodies in the clinic by 2021.
    - By 2030, Ligand projects that more than 1,000 OmniAb campaigns will have been initiated and 25 to 35 OmniAb products on the market.
    - Based on current market sizes and royalty rates, Ligand projects potential for between $500 million and $1 billion in annual OmniAb royalties in 2030.
- The likelihood of approval at Phase 1 for antibody drugs is approximately 11.5%, compared with approximately 6.2% for small-molecule drugs based on historical data, and that the selling antibodies currently on the market have more than $4 billion in annual sales.
    - By 2024, antibody drugs are expected to represent 12 of the Top 20 best-selling drugs (up from seven of the Top 20 in 2017), with antibody drug sales exceeding $94 billion (up from $57.4 billion in 2017).
- Ligand disclosed at the Analyst Day event an internal OmniChicken antibody program that was initiated in mid-2018, and currently includes five immuno-oncology targets. Ligand intends to initiate partnering discussions for these targets in the second half of 2019.

Captisol-enabled Iohexol:

- Ligand has a history of creating value by investing in internal R&D to drive partnering events with upsized licensing terms. Investments in R&D have created some of the company's most valuable licenses.
- In addition to the OmniChicken program discussed above, at today's event Ligand reviewed its CE-Iohexol program, which follows past success with Captisol-enabled melphalan (now EVOMELA®). Ligand spent approximately $2 million on EVOMELA R&D and to date has received 10 times the cash return on that investment having received over $21 million in cash payments. Ligand holds an ongoing 20% royalty on net sales of EVOMELA, and worldwide sales are projected to grow.

- CE-Iohexol is designed to reduce acute kidney injury (AKI) during medical interventions, including imaging procedures using iodinated contrast agent administration. This program was established in 2018 and a Phase 1 clinical trial is currenting launching, with data expected in the second half of 2019.
    - More than 30 million imaging procedures are performed each year in the U.S. AKI is a continuing issue with broad medical visibility. Currently no products are approved to prevent or treat AKI in this setting.

Financial overview and outlook, and investment philosophy:

- Management highlighted Ligand's history of strong revenue growth and its expectations for continued growth in the near- and long-term. Revenue growth has contributed to significant cash flow and per-share earnings.
- Ligand affirmed 2019 guidance for total revenue of approximately $118 million ($48 million from royalties, $27 million from materials sales and $43 million from contract payments), gross margin of more than 92%, total cash expenses of $48 million to $52 million, EBITDA margin of approximately 50%, a tax rate of 21% to 23%, and adjusted diluted EPS of more than $32.25, including a one-time gain on the sale of the Promacta® royalty of $29.05 per share and $3.20 per share from operations.
- The company provided a preliminary outlook for 2020 financials, noting that formal 2020 guidance will be given after trends from 2019 are confirmed. To assist analysts and investors understand how the company is analyzing the range of potential 2020 guidance, management made the following commentary:
    - Royalties follow sales trends of underlying products, and consensus estimates for sales trends will guide management in firming expectations for 2020. Currently Ligand believes potential royalty revenue growth for 2020 could be in the range of 35% to 50% over 2019.
    - Material sales are driven by partner orders of Captisol for use in commercial activities and clinical trials. Once 2019 orders are known, the company will be able to estimate 2020 material sales. Currently the company expects 2020 material sales to grow 5% to 10% over 2019.
    - Milestone and license revenues are driven by partner annual fees, preclinical and clinical trial progress, NDA-related filings, collaboration revenue and other partner events, and the timing of such events fluctuates based on the progress of Ligand's partners in developing their programs. The company will be able to more accurately estimate 2020 milestones closer to 2020; however, currently the company expects 2020 milestone and license revenues to exceed those of 2019, with the potential for at least $50 million of contract payments in 2020.
- Management noted that 2020 corporate gross margin is expected to be in the range of 92% to 94%, that the company's cash operating expense structure is expected to be approximately $50 million, in line with expectations for 2019, and that EBITDA margin is expected to be approximately 57.5%. These items combined with a share count of 21.5 million equates to adjusted diluted EPS of at least $4.00.
- Management provided an overview of some of the key financial metrics for Ligand over a five-year outlook. Specifically, management expects a revenue CAGR

exceeding 15%, cash operating expenses to remain at approximately $50 million with increases to account for inflation, and EBITDA margin to expand from 50% in 2019 to over 75%, with 5% to 10% annual increases.

- Management discussed Ligand's investment philosophy. Ligand has focused its external investments on corporate M&A, royalty investments and purchases, and company formation and seed investments. Ligand has focused its internal investments on its R&D programs and returning cash to shareholders through share repurchases.
- Ligand provided a summary of its merger and acquisition history. Ligand has made 16 acquisitions and investments over the past 11 years. Having spent $445 million on these transactions, Ligand has already received more than $500 million as a return on these investments. After receiving more than its cash back, Ligand is now positioned to realize significant gains from its 200+ Shots on Goal, its portfolio of $3.5 billion of potential contract payments and its three major technology platforms for new licensing transactions.

Partner presentations:

- Edward van den Brink, Ph.D., Associate Director, Global Antibody Discovery of GenMab B.V. (GEN.CO), gave an overview of GenMab's experience and success in using the OmniAb platform's OmniRat technology. GenMab reports high success rates in using OmniRat for 38 proprietary antibody targets, with 98% sequence homology with rat orthologue and more than 80% of animals develop an antigen-specific titer. He also highlighted Ligand's continuous innovation of the OmniAb platform as a value-driver for the platform. The anti-PD-L1 arm of GenMab's Duobody program is OmniRat-derived.
- Brian Lian, Ph.D., CEO of Viking Therapeutics (NASDAQ: VKTX), gave an overview of VK5211 and VK2809, two Ligand-partnered Phase 2 programs supported by encouraging clinical data. The VK2809 program for NASH is a novel, selective thyroid receptor-b agonist with Phase 2 results that demonstrate significant reduction in liver fat content and lipids. Viking plans to initiate a Phase 2b clinical trial in biopsy-confirmed NASH in 2019.
- Wes Kaupinen, CEO of Palvella Therapeutics, gave an overview of PTX-022 (QTORINTM rapamycin formulation), which is positioned to be the first and only therapy to address the root cause of pachyonchia congenita (PC), a serious, chronically debilitating, lifelong monogenic disease. He also commented on the near-term potential to expand PTX-022 beyond PC into other areas of unmet medical need. Mr. Kaupinen described an attractive market opportunity in PC, a rare disease state with an estimated annual U.S. revenue opportunity exceeding $300 million. PTX-022 has garnered FDA support including Fast Track and orphan drug designations. Palvella has initiated a Pivotal Phase 2/3 study with data readout targeted for the second quarter of 2020.
- Jan-Anders Karlsson, Ph.D., CEO of Verona Pharma plc (NASDAQ:VRNA), gave an overview of Verona's novel first-in-class product candidate ensifentrine (RPL554) for the treatment of respiratory diseases. Ensifentrine's has a legacy linked to the

Vernalis Design Platform. Verona sees an opportunity for ensifentrine in 40% of U.S. COPD patients who are symptomatic despite current treatment. Verona has announced positive interim Phase 2 data with ensifentrine dry powder inhaler formulation in COPD with dose-dependent, significant and clinically meaningful bronchodilator response. Verona sees potential for multiple value-creating inflection points with Phase 2 readouts in 2019 as they prepare for Phase 3 trials.

A webcast of the Analyst Day presentations can be accessed at www.ligand.com for the next 90 days. A copy of the company's presentation will be filed with the Securities and Exchange Commission today.

Adjusted Financial Measures

The company reports adjusted net income per diluted share in addition to, and not as a substitute for, or superior to, financial measures calculated in accordance with GAAP. The company's financial measures under GAAP include share-based compensation expense, amortization of debt-related costs, amortization related to acquisitions and intangible assets, changes in contingent liabilities, mark-to-market adjustments for amounts relating to our equity investments in Viking Therapeutics and Retrophin, acquisition and integration costs, unissued shares relating to the Senior Convertible Notes and others that are listed in the itemized reconciliations between GAAP and adjusted financial measures included in our earnings release for the 2018 fiscal year. However, other than with respect to total revenues, the company only provides guidance on an adjusted basis and does not provide reconciliations of such forward-looking adjusted measures to GAAP due to the inherent difficulty in forecasting and quantifying certain amounts that are necessary for such reconciliation, including adjustments that could be made for changes in contingent liabilities, changes in the market value of our investments in Viking Therapeutics and Retrophin, share-based compensation expense and effects of any discrete income tax items. Management has excluded the effects of these items in its adjusted measures to assist investors in analyzing and assessing the company's past and future core operating performance. Additionally, adjusted earnings per diluted share is a key component of the financial metrics utilized by the company's board of directors to measure, in part, management's performance and determine significant elements of management's compensation.

About Ligand Pharmaceuticals

Ligand is a biopharmaceutical company focused on developing or acquiring technologies that help pharmaceutical companies discover and develop medicines. 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. Ligand's Captisol® platform technology is a patent-protected, chemically modified

cyclodextrin with a structure designed to optimize the solubility and stability of drugs. OmniAb® is a patent-protected transgenic animal platform used in the discovery of fully human mono-and bispecific therapeutic antibodies. Ligand has established multiple alliances, licenses and other business relationships with the world's leading pharmaceutical companies including Novartis, Amgen, Merck, Pfizer, Celgene, Gilead, Janssen, Baxter International and Eli Lilly.

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Forward-Looking Statements

This news release contains forward-looking statements by Ligand that involve risks and uncertainties and reflect Ligand's judgment as of the date of this release. Words such as “plans,” “believes,” “expects,” “anticipates,” and “will,” and similar expressions, are intended to identify forward-looking statements. These forward-looking statements include, without limitation, statements regarding: financial projections, expectations regarding research and development programs, potential uses of capital, including any potential dividend or share repurchase program, and the timing of the initiation or compilation of preclinical studies, clinical trials by Ligand and its partners, Ligand’s belief regarding the diversified nature of its business, Ligand’s future revenue and guidance regarding the financial results for 2019 and beyond. Actual events or results may differ from Ligand's expectations due to risks and uncertainties inherent in Ligand’s business, including, without limitation: Ligand has wide discretion on its use of capital and may choose not to engage in any share repurchases, declare any dividends or pursue acquisitions or internal develop programs; Ligand and its partners may not be able to timely or successfully advance any product(s) in its internal or partnered pipeline; drug development program benefits may not be realized; Ligand may not achieve its guidance in 2019 or thereafter; third party research summarized herein or in the Analyst Day presentation may not be correct or complete; Kyprolis®, EVOMELA® and Zulresso™ may not perform as expected; Ligand relies on collaborative partners for milestone and royalty payments, royalties, materials revenue, contract payments and other revenue projections; regulatory hurdles facing Ligand's and its partners’ product candidates; uncertainty regarding Ligand's and its partners’ product development costs; the possibility that Ligand's and its partners’ drug candidates might not be proved to be safe and efficacious and uncertainty regarding the commercial performance of Ligand's and/or its partners’ products; the possibility that Ligand may not be able to successfully implement its strategic growth plan and continue the development of its proprietary programs; the possibility that Ligand’s future investments might not yield value and might not materialize as describe; and other risks and uncertainties described in Ligand’s public filings with the Securities and Exchange Commission The failure to meet expectations with respect to any of the foregoing matters may reduce Ligand's stock price. Additional information concerning these and other risk factors affecting Ligand can be found in prior press releases available at www.ligand.com as well as in Ligand's public periodic filings with the Securities and Exchange Commission available at www.sec.gov. Ligand disclaims any intent or obligation to update these forward-looking statements beyond the date of this release, including the possibility of additional license fees and milestone revenues we may receive. This caution is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995.

Information regarding partnered products and programs comes from information publicly released by our partners. Information presented by GenMab, Viking Therapeutics, Verona Pharma and Palvella Therapeutics are the responsibility of each company, respectively. Ligand may be deemed an affiliate of Viking Therapeutics because Ligand holds a substantial amount of Viking securities and one of Ligand's officers serves as a director of Viking.

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