LIGAND PHARMACEUTICALS INC
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Subject Company: Ligand Pharmaceuticals Incorporated

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The following slides will be presented by officers of Ligand Pharmaceuticals Incorporated on September 9, 2009 at the Thomas Weisel Partners Healthcare Conference in Boston, Massachusetts:

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John L. Higgins
President and Chief Executive Officer
Syed Kazmi, Ph.D.
Business Development and Strategic Planning

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Safe Harbor Statement

The following presentation contains forward-looking statements regarding the proposed acquisition of Neurogen by Ligand, including projections regarding expectations for potential research and development payments, savings in operational costs, cash burn rates, timing of achieving positive cash flow, and potential revenue and profits of a combined company.

The forward looking statements made in the presentation are subject to several risk factors, including, but not limited to the reliance on collaborative partners for milestone and royalty payments, regulatory hurdles facing product candidates, uncertain product development costs, disputes regarding ownership of intellectual property, the commercial success of approved products, the failure of Neurogen s stockholders to approve the merger, Ligand s or Neurogen s inability to satisfy the conditions of the merger, or that the merger is otherwise delayed or ultimately not consummated, and a failure of the combined businesses to be integrated successfully. Additional risks may apply to forward looking statements made in this presentation.

The risk factors facing Ligand and Neurogen are explained in greater detail in the Company s and Neurogen s filings with the SEC, including the most recently filed annual reports on Form 10-K and quarterly reports on Form 10-Q, as well as other public filings.

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Additional Information and Where to Find It

Ligand intends to file with the SEC a Registration Statement on Form S-4, which will include a proxy statement of Neurogen and other relevant materials in connection with the proposed transaction. The proxy statement will be mailed to the stockholders of Neurogen. Investors and security holders of Neurogen are urged to read the proxy statement and the other relevant materials when they become available because they will contain important information about Ligand, Neurogen and the proposed transaction. The proxy statement and other relevant materials (when they become available), and any other documents filed by Ligand or Neurogen with the SEC, may be obtained free of charge at the SEC's web site at www.sec.gov. In addition, investors and security holders may obtain free copies of the documents filed with the SEC by Ligand by going to Ligand s Investor Relations page on its corporate website at www.ligand.com. Investors and security holders may obtain free copies of the documents filed with the SEC by Neurogen by going to Neurogen s Investor Relations page on its corporate website at www.neurogen.com. Investors and security holders of Neurogen are urged to read the proxy statement and the other relevant materials when they become available before making any voting or investment decision with respect to the proposed transaction.

Ligand and its respective directors and executive officers may be deemed to be participants in the solicitation of proxies from the stockholders of Neurogen in favor of the proposed transaction. Information concerning Ligand s directors and executive officers is set forth in Ligand s proxy statement for its 2008 annual meeting of shareholders, which was filed with the SEC on April 29, 2008, and annual report on Form 10-K filed with the SEC on March 5, 2008.

Neurogen
and
its
respective
directors
and
executive
officers
may
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solicitation
of
proxies from the stockholders of Neurogen in favor of the proposed transaction. Information about Neurogen s executive officers and directors and their ownership of Neurogen common stock is set forth Neurogen s amended annual report on Form
10-K,
which
was
filed
with

the SEC on April 30, 2009. Investors and security holders may obtain more detailed information regarding the direct and indirect interests of Neurogen and its respective executive officers and directors in the acquisition by reading the proxy statement regarding the merger, which will be filed with the SEC.

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Fundamentals of a Strong Biotech Company

Strong balance sheet

Spending discipline

Strong discovery capabilities and track record

Robust pipeline of partnerable
assets

Revenue diversity
Operating structure that has the potential to
generate substantial cash flows and profitability

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Ligand Company Overview

Company with great assets
-
Two royalty streams, plus two more royalty-bearing products recently approved
-
Ten pharma
deals with over 21 development programs and over $600 million of
potential milestones
-
Prolific drug discovery engine has produced multitudes of drug candidates

Highly successful drug discovery capabilities
-
Focus on early-stage drug discovery and development
-
Partner pipeline assets at earliest value inflection point

Leadership focused on shareholders and market credibility
-
Cost-efficient R&D business with tight spending discipline
-
Clear communication and transparency with investors
-
Clarity on how to drive a business forward in this market environment

Commitment to driving shareholder value and to transparency on the business
with goal to drive strong cash flow and earnings

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Ligand
Recent events

Signed agreement to acquire Neurogen, public company with drug screening assets, cash, pipeline and a drug partnership

PROMACTA
®
Phase I/II trial initiated with MDS

CONBRIZA
approved in Europe for the treatment of osteoporosis

FABLYN®
Approved in Europe for the treatment of osteoporosis

Entered license agreement with ParinGenix for Phase II COPD drug

Completed lease buyout, substantially reducing contractual lease costs going forward

Initiated Phase I SARM trial

Wyeth JAK 3 data presented at ACS

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Pending Neurogen Acquisition
Stock-for-Stock Acquisition
Consideration
-
Net proceeds from sale of real
estate
-
Net proceeds from sale of Aplindore
-
$3 million for Phase III trial initiation
for Merck VR1 program
-
$4 million if license H3 program
CVRs
$11 million in Ligand Common Stock,
plus potential for Four Contingent Value

Rights (CVR)
Transaction Value
4Q 2009
Anticipated Closing Date
Ligand to acquire Neurogen (NRGN)
Deal
Actual timing of the transaction will depend on a number of factors, some of which are beyond either company s control.

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Opportunity with Neurogen Acquisition

Acquire fully funded research partnership
Merck VR1 program

Access pipeline assets
Numerous opportunities including oral EPO and H3 antagonist

Leverage drug discovery capabilities of both companies
Accelerated Intelligent Drug Design platform

Gain estimated $7 million in net cash

Acquire substantial NOLs
before limitations

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Partnership Highlights

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Significant Value in Royalty Partnerships

Numerous deals with ten pharmaceutical companies

More than 21 different programs being pursued including the largest untapped markets
Muscle wasting, COPD, thrombocytopenia, pain, asthma, Alzheimer s

More than $600 million in potential R&D and milestone payments from existing deals
Ligand has one of the strongest, most diverse royalty partnership rosters in the small cap biotech universe

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Pharmaceutical Partnerships

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Combined Product Pipeline

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PROMACTA approved for treatment of thrombocytopenia in patients with chronic immune ITP in November 2008.

Two Phase III Hepatitis trials ongoing

Phase III trial in Chronic Liver Disease ongoing

Phase I/II MDS trial initiated Spring 2009

Phase I Sarcoma trial ongoing

Submitted MAA for the long-term treatment
of ITP in December 2008.

LGD-4665 and other Ligand TPO molecules
licensed to GSK in December 2008
&
Collaboration Highlights

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Thrombocytopenia -
Causes of Disease

Decreased production of platelets
Myelodysplastic
syndrome
Hepatitis C
Cancer in the bone marrow (leukemia)
Aplastic
anemia

Increased destruction of platelets
Autoimmune, such as ITP
Sequestration in the spleen

Drug-induced
Myelosuppression
by chemotherapy regimens
Anti-virals
in Hep

C therapies
Thrombocytopenia is a condition in which there is an abnormally low level of
platelets in the blood.
Regardless of the underlying cause, thrombocytopenia leads to decreased platelet counts,
which puts patients at greater risk for bleeding and serious adverse events.

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Medical Significance of Thrombocytopenia (US)
(Estimated markets)
Potential
Treatable
Patients
ITP
~60,000
Hepatitis C
~120,000
Chronic Liver Disease
~400,000
Myelodysplastic
syndrome
~20,000
Leukemia / lymphoma
~50,000
Chemotherapy induced thrombocytopenia

~140,000
Intensive care unit
acquired
~500,000
Bone marrow transplants
~50,000
Lupus
~100,000
Cirrhosis
~113,000
HIV/other
~600,000
~ 2 million platelet transfusions per year

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ParinGenix
License

In June 2009, Ligand granted exclusive license rights to ParinGenix for three issued U.S. patents relating to certain desulfated heparin compounds

ParinGenix lead compound, PGX-100, is an intravenous formulation of 2-O, 3-O desulfated heparin which is in a Phase IIb trial for the treatment of acute COPD exacerbations (~700,000 patients require hospitalization every year)

License terms
$350,000 upfront payment
3% royalty on net sales in the US

The transaction adds another potential lucrative royalty stream to Ligand's already promising list of partnered, fully funded, royalty-bearing programs

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SERM Collaborations

Bazedoxifene
Monotherapy:
CONBRIZA approved in Europe in April 2009
Viviant pending approval in the U.S.

Bazedoxifene
in Combination with Premarin
CE (APRELA):
Phase III data published in *Fertility and Sterility*
NDA planned for in 2010

Lasofoxifene

(FABLYN) for osteoporosis treatment	
Approved in Europe in March 2009 for the treatment of osteoporosis	
NDA pending approval in U.S.; FDA issued Complete Response Letter in January 2009	

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Collaboration Highlights
&

Collaboration began in November 1997

Partnership resulted in lead and back-up
p38 kinase
inhibitor compounds

Anti-inflammatory therapeutics
Ongoing Clinical Trials:

Phase II in rheumatoid arthritis

Phase II in psoriasis

Phase II in atherosclerosis
The Opportunity:

Large, established target markets

If successfully developed, Ligand estimates
product could be on market in 2014
p38 Kinase
Inhibitors

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&

Collaboration began in October 1998

Collaboration produced multiple drug candidates
Completed Clinical Trials:

Phase II in COPD

Phase II in asthma

Phase II in psoriasis
The Opportunity:

Large, established target markets

If successfully developed, Ligand estimates
product could be on market in 2014
Chemokine
Receptor
CXCR2
Program
Collaboration Highlights

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Collaboration Highlights
&
Other Research Program
Ongoing Clinical Trials:

Enzyme inhibitor in Phase II for oncology

Candidate for inflammatory diseases in Phase I

Candidate for respiratory diseases in Phase I
Recent Event:

BACE inhibitor for Alzheimer s in development,

resulting in a milestone payment of $1 million

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Collaboration Highlights
&

Collaboration began March 2006

Identify and advance molecules in chosen therapeutic programs to development stage
Milestone and Royalty:

7 compounds identified to date

Success-based milestone payments and

up to double-digit royalties upon
commercialization

Seventh lead compound identified resulting in
a milestone payment of $500,000
Broad Discovery Program

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Collaboration Highlights
&

Collaboration began in December 2006
$3 million per year in research funding

Alliance based on development of JAK3 kinase
inhibitors for systemic administration for immunological and inflammatory diseases

Success-based milestone payments and up to double-digit royalties upon

commercialization
JAK-3 Kinase

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SARM Program Overview

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Selective Androgen Receptor Modulator Program

LGD-4033 is a selective androgen receptor modulator (SARM), designed to provide the benefits of androgen receptor stimulation on skeletal muscle and bone without the side effects of the currently marketed androgens

LGD-4033 has demonstrated increased skeletal muscle mass and bone mineral density while sparing the prostate in males and masculinizing
effects in females in preclinical models

A Phase I study was initiated in summer 2009 to evaluate the safety, tolerability and pharmacokinetic profile of LGD-4033 (expected completion 1H2010)

Target
Indications:
Sarcopenia
&
frailty,
cachexia,
osteoporosis,
hypogonadism, sexual dysfunction
Market Need:
Convenient, prostate-sparing androgen receptor modulator with activity in bone, muscle and CNS

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Research Engine

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Ligand Research Platform

Technology
-
Gene reporter assays for nuclear receptors and JAK/STAT-coupled receptors
-
Ultra high-throughput screening platform combined with the world s largest
proprietary
compound
collection
(5
+
million
compounds)

Highly flexible screening platform: cell-free and cell-based assays; functional and
binding assays

Consistently high rate of success across all classes of targets

Preclinical Development
-
Extensive track record both independently and with partners
-
Total of 48 clinical candidates discovered and 24 INDs
filed

Solid track record for publications
-
Quality journals: *Science, Cell, Endocrinology, Journal of Medicinal Chemistry*
-
First reports for many important discoveries*:*

Hematopoietic receptor-targeted small molecule drugs

Non-steroidal selective androgen receptor modulators

Non-steroidal selective progesterone receptor modulators

RXR-selective retinoid

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Ligand Development & Partnerships

Clinical strategy to run Phase I-II programs through proof-of-concept

13 NDAs
and MAAs
submitted for Ligand discovered drugs

5 approved products from Ligand technology: Targretin, Panretin,
Promacta, Fablyn, Conbriza

Established track record for partnering with over 40 collaborations
with more than 30 different companies

Experience in multiple therapeutic areas

More than 21 different programs being pursued including the largest
untapped markets
Muscle wasting, COPD, thrombocytopenia, pain, asthma, osteoporosis,
Alzheimer s

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Pro Forma Financial Forecast
* Assumes Neurogen Acquisition closes in Q4 2009

Projected to have approximately $50 million in cash at year-end 2009

Given our current outlook on the combined businesses, 2010 pro forma operating business projected to be approximately cash-flow neutral with expenses in line with revenue

Potential for additional revenue and cash infusion from new license agreements

More than $500 million in potential Net Operating Loss carry-forwards before limitations

Robustly capitalized company that has sufficient cash to make it to profitability without additional financings

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Potential Near-Term Milestone and Events

Completion of Schering Plough CXCR2 Trial in COPD

Compound nomination from JAK-3 program by Wyeth for pre-clinical development

Compound nomination by GSK from drug discovery collaboration

Nomination of Oral EPO drug candidate

VIVIANT FDA Action

Potential for over $10 million in milestone payments from existing collaborations

Milestone or Event

SARM Phase I trial completion

PROMACTA EU NDA Action

PROMACTA data at ASH