idera®
PHARMACEUTICALS

Discovery and Development in Diverse Therapeutic Applications

ANNUAL REPORT 2009

idera® PHARMACEUTICALS

Pipeline of Drug Candidates

Oncology

IMO-2055 (TLR9 AGONIST)	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
• Head and Neck				
• NSCLC				
• Colorectal Cancer				

PARTNERED WITH

Merck KGaA
Darmstadt · Germany

Infectious Diseases

IMO-2125 (TLR9 AGONIST)	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
• HCV (Null Responders)				
• HCV (Treatment-Naïve)				

Autoimmune/Inflammatory Diseases

IMO-3100 (TLR7/9 ANTAGONIST)	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
• MoA in Healthy Subjects				
• Lupus				
• Rheumatoid Arthritis				
• Psoriasis				

Respiratory Diseases

IMO-2134 (TLR9 AGONIST)	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
• Asthma and Allergy				

Vaccine Adjuvants

TLR 7, 8, 9 AGONIST CANDIDATES	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3
• Cancer, Infectious Diseases, Alzheimer's Disease				

PARTNERED WITH

MERCK

Discovery

Idera has extensive experience in nucleic acid chemistry. This experience provides Idera with an expertise in creating novel, **nucleic acid-based drug candidates**, each with a specific mechanism of action. Idera's drug candidates include agonists, antagonists, and antisense. These drug candidates are targeted to **Toll-like Receptors** (TLRs), a family of immune system receptors that direct immune system responses.

Development

Idera has brought **four TLR-targeted drug candidates into clinical development**, as internal or collaborative programs. These drug candidates are in various stages of clinical development in **different therapeutic applications**. To optimize the potential of its discoveries, Idera seeks to advance certain therapeutic applications through internal development and others through collaborative partnerships.

Diverse Therapeutic Applications

Drug candidates that modulate immune responses mediated through TLRs have potential applications for a broad range of diseases. At present, Idera has internal or collaborative research programs for the potential treatment of several diseases including: **chronic hepatitis C virus infection; cancer; autoimmune and inflammatory diseases such as lupus, rheumatoid arthritis, and psoriasis; respiratory diseases; and for the development of vaccine adjuvants**. The involvement of the immune system in many diseases may provide an opportunity for Idera's drug candidates to be developed in other therapeutic applications, including cardiovascular diseases and hematological malignancies.

Dear Shareholders,

Idera's progress and achievements for the year 2009 derive from our expertise and experience in the application of nucleic acid chemistry to drug discovery. This year we reported new results from clinical trials in cancer and chronic hepatitis C virus infection and initiated a new clinical development program in autoimmune and inflammatory diseases. Our efforts are focused on drug candidates targeted to toll-like receptors, or TLRs, a class of proteins that mediate immune responses.

Business Strategy

Our business strategy is to pursue internal and collaborative programs simultaneously, to take full advantage of our productive research capability. At present, we have internal or collaborative research programs for the treatment of chronic hepatitis C virus infection, cancer, autoimmune and inflammatory diseases, respiratory diseases, and for the development of vaccine adjuvants.

Hepatitis C Virus

We recently presented encouraging interim safety and efficacy data from the first-in-human Phase 1 trial of IMO-2125, a TLR9 agonist, at the European Association for the Study of the Liver 2010 annual meeting. IMO-2125 is our lead drug candidate for the treatment of hepatitis C virus (HCV) infection. The clinical trial is being conducted in patients who show no benefit when treated with the standard of care therapy, which is 48 weeks of recombinant pegylated interferon plus ribavirin. These patients are referred to as null responders, and there is currently no approved therapy for these patients who have a high medical need. Our Phase 1 clinical data showed a reduction in HCV viral load, which correlated well with the levels of natural interferon alpha and with other anti-viral proteins induced by IMO-2125 treatment. Based on these results, we believe that IMO-2125, which induces natural interferon-alpha and other anti-viral proteins, may offer an alternative to using recombinant pegylated interferon-alpha in HCV therapy. Our next goal is to optimize the IMO-2125 treatment regimen and initiate a Phase 2 clinical trial of IMO-2125 in combination with ribavirin in null responder HCV patients. In addition, we expect the data from an ongoing study in treatment naïve HCV patients to be available by the end of 2010.

Autoimmune Diseases

We recently initiated clinical development of IMO-3100, a TLR antagonist designed to block immune responses mediated through TLR7 or TLR9. Independent researchers have shown that TLR7 and TLR9 are involved in disease progression in patients who have autoimmune diseases such as lupus, rheumatoid arthritis, and psoriasis. Drugs approved to treat these disorders include antibodies, which block the activity of pro-inflammatory proteins produced by the immune system such as tumor necrosis factor (TNF) and interleukins 6 and 12. In contrast, the mechanism of action of IMO-3100 is to inhibit pro-inflammatory immune responses, including pro-inflammatory proteins, by blocking TLR7 and TLR9 activity. We have reported encouraging results in animal models of lupus, rheumatoid arthritis, psoriasis, and other autoimmune diseases. We are currently conducting a Phase 1 clinical study in healthy volunteers to evaluate the safety, tolerability, and mechanism of action (MoA) of IMO-3100. Results from this trial will be used to prioritize one or more autoimmune disease indications for further development.

Respiratory Diseases

IMO-2134, also known as QAX935, is a TLR9 agonist designed by Idera that was selected by Novartis during our collaboration and was advanced into Phase 1 clinical development for the treatment of asthma and allergy. In February 2010, Idera regained the rights to IMO-2134. We are appreciative of the contributions Novartis made toward selection of IMO-2134 as a lead drug candidate. We are in the process of defining a strategy for further development of IMO-2134.

Cancer Treatment

A collaborative program with our partner Merck KGaA is focused on the development of TLR9 agonists for cancer therapy. We are very pleased with the progress Merck KGaA has made with the lead drug candidate IMO-2055, also known as EMD 1201081, in a broad range of cancer therapy indications including a recently initiated randomized Phase 2 clinical study in head and neck cancer and ongoing clinical studies in non-small cell lung cancer and colorectal cancer. We look forward to reporting the data from these studies as they become available.

Vaccine Adjuvants

We are collaborating with Merck & Co. on the potential use of TLR agonists as vaccine adjuvants. Scientists from Merck & Co. and Idera have reported promising results from preclinical studies at various scientific meetings and in peer-reviewed scientific publications.

Our business strategy to advance certain applications of our research and development through collaborations has enabled us to receive $84 million in upfront and milestone payments over the past five years. These payments have allowed us to maintain a strong financial position and to advance our internal programs. We ended 2009 with $40.2 million in cash and investments, which enables us to address our key objectives for the coming year.

We are committed to the rapid advancement of our promising drug candidates toward the goal of providing better treatment options in areas of unmet medical need.

A summation of the significant events at Idera during the past 12 months would not be complete without expressing our heartfelt sadness on the passing of Paul C. Zamecnik, M.D., in October 2009. Paul was a founder of our company and he continued to have a presence at Idera as Director Emeritus. We are grateful to Paul for his contributions to science, medicine, and our company.

We recognize and express our appreciation for the ongoing support of our shareholders. We look forward to providing continued updates on our progress.

Sincerely,

Sudhir Agrawal, D. Phil.
President, Chief Executive Officer
and Chief Scientific Officer

James. B. Wyngaarden, M.D.
Chairman of the Board of Directors

Sudhir Agrawal, D. PHIL. James B. Wyngaarden, M.D.

Corporate Information

BOARD OF DIRECTORS

James B. Wyngaarden, M.D.
Chairman

Sudhir Agrawal, D. Phil.
President, Chief Executive Officer, and Chief Scientific Officer

Youssef El Zein
Director, Pillar Investment Limited

C. Keith Hartley
President, Hartley Capital Advisors

Robert W. Karr, M.D.
Former Senior Vice President, Pfizer, Inc.

Malcolm MacCoss, Ph.D.
Former Vice President, Schering-Plough

Hans Mueller, Ph.D.
Former Senior Vice President, Wyeth Pharmaceuticals

William S. Reardon, CPA
Retired Audit Partner, PricewaterhouseCoopers, LLP

Alison Taunton-Rigby, Ph.D., O.B.E.
Chairman and Chief Executive Officer, RiboNovix, Inc.

MANAGEMENT

Sudhir Agrawal, D. Phil.
President, Chief Executive Officer, and Chief Scientific Officer

Louis J. Arcudi, III, MBA
Chief Financial Officer, Treasurer, and Secretary

Timothy M. Sullivan, Ph.D.
Vice President, Development Programs and Alliance Management

Robert Arbeit, M.D.
Vice President, Clinical Development

Ekambar R. Kandimalla, Ph.D.
Vice President, Discovery

Steven J. Ritter, Ph.D., J.D.
Vice President, Intellectual Property and Contracts

Nicola La Monica, Ph.D.
Vice President, Biology

Rahul Jasuja, Ph.D.
Vice President, Corporate Development

STOCKHOLDERS' MEETING

The 2010 Annual Meeting of Stockholders will be held at Le Meridien Cambridge - MIT, 20 Sidney Street, Cambridge, MA on June 15, 2010 at 10:00 a.m. EDT. A notice of the meeting, proxy statement, and proxy voting card have been mailed to stockholders with this Annual Report.

INVESTOR RELATIONS

Additional copies of this Annual Report, which includes the Company's Annual Report on Form 10-K for the year ended December 31, 2009, as filed with the Securities and Exchange Commission, are available upon request to:

Investor Relations
Idera Pharmaceuticals, Inc.
167 Sidney Street
Cambridge, MA 02139

Phone: 617-679-5500
Email: ir@iderapharma.com
www.iderapharma.com

REGISTRAR & TRANSFER AGENT

BNY Mellon Shareowner Services
480 Washington Boulevard
Jersey City, NJ 07310-1900
www.bnymellon.com/shareowner/isd

- Toll Free Number: 1-800-288-9541
- TDD Hearing Impaired: 1-800-231-5469
- Foreign Stockholders: 1-201-680-6578
- TDD Foreign Stockholders: 1-201-680-6610

LEGAL COUNSEL

Wilmer Cutler Pickering Hale & Dorr, LLP
60 State Street
Boston, MA 02109

INDEPENDENT AUDITORS

Ernst & Young, LLP
200 Clarendon Street
Boston, MA 02116

COMMON STOCK SYMBOL

NASDAQ: IDRA

FORWARD-LOOKING STATEMENT

Any statement that we may make in this Annual Report about future expectations, plans and prospects for the Company constitutes forward-looking statements for purposes of the safe harbor provisions under The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by these forward-looking statements as a result of various important factors, including the risks set forth under the caption "Risk Factors" on page 19 in Idera's Annual Report on Form 10-K for the year ended December 31, 2009 included in this Annual Report. Idera disclaims any intention or obligation to update any forward-looking statements.

DESIGN: FASSINO/DESIGN • WWW.FASSINO.COM

idera®
PHARMACEUTICALS

WWW.IDERAPHARMA.COM

IDERA PHARMACEUTICALS, INC.
167 SIDNEY STREET
CAMBRIDGE, MA 02139
617.679.5500