Striding Ahead

2013 Annual Report

Dear Idera Stockholders,

During 2013, Idera has evolved its long-standing scientific leadership into what is today a deep and diverse clinical-stage pipeline focused on meeting the needs of orphan patient populations in B-cell lymphomas and autoimmune diseases.

We have worked diligently to build value for our shareholders by making great progress in each of the three areas we believe are essential for a successful and sustainable life science organization – translation of novel scientific concepts into clinical proof-of-concept, building an experienced and skilled leadership team, and securing the financial resources needed to bring novel therapies to patients.

Our pipeline of novel drug candidates is created using two drug discovery platforms based on our core expertise in designing synthetic nucleic acids. Our first platform has allowed us to create drug candidates to block over-activation of specific Toll-like receptors (TLRs) which are implicated in diverse pathological conditions. These compounds are referred to as TLR antagonists. Our second platform is based on our gene silencing oligonucleotides (GSOs), which are designed to inhibit the production of disease-associated proteins by targeting RNA and have potential broad applicability in various therapeutic areas.

TLR Antagonism, a Novel Therapeutic Approach

Toll-like receptors (TLRs) are part of the immune system for normal surveillance. However, in autoimmune diseases, organ or tissue damage leads to over-activation of TLRs. There is a strong scientific and clinical rationale for blocking the over-activation of TLRs as a novel therapeutic approach. We believe we have established clinical proof-of-concept of TLR antagonism with our drug candidates in patients with psoriasis, an autoimmune disease. With these data in hand, we are pursuing our business strategy to advance clinical development of our lead drug candidate--IMO-8400, a TLR antagonist--for the treatment of genetically defined forms of B-cell lymphomas and orphan autoimmune diseases with high unmet medical need.

Genetically Defined Forms of B-cell Lymphoma Program

Our program in genetically defined forms of B-cell lymphoma is based on insights into the biology of cancer. In 2011, investigators from the National Cancer Institute of NIH reported the presence of an oncogenic mutation referred to as MYD88 L265P in some patients with select types of B-cell lymphomas. Since then, multiple investigators have reported the importance of this mutation, which is associated with over-activation of specific TLRs. Based on these reports, we have conducted our own preclinical studies, in which we observed that **IMO-8400 specifically inhibited the survival of cancer cells with this mutation**, providing a strong rationale to advance IMO-8400 for clinical evaluation.

We have begun clinical development of IMO-8400 in B-cell lymphomas harboring the MYD88 L265P mutation. Our initial clinical development is focused on patients with **Waldenström’s macroglobulinemia**, a non-Hodgkin lymphoma of malignant lymphoplasmacytic B-cells, and **diffuse large B-cell lymphoma** (DLBCL), which is an aggressive lymphoma. Patient enrollment in Phase 1/2 trials for Waldenström’s macroglobulinemia and DLBCL is currently ongoing. Both of these diseases have significant unmet medical need.

Orphan Autoimmune Disease Program

As part of our business strategy, we have taken a strategic review to prioritize orphan autoimmune disease indications with unmet medical need, in which TLRs are strongly implicated. This has led to the identification of **polymyositis and dermatomyositis** as the initial two orphan autoimmune disease indications for the development of IMO-8400. Both polymyositis and dermatomyositis have been designated as orphan diseases by the U.S. Food and Drug Administration (FDA). We expect to initiate clinical development during the second half of 2014.

We are prioritizing a growing list of orphan diseases in which TLRs are potentially implicated, and therefore might be treated with our drug candidates. To meet the need, we are expanding our pipeline of drug candidates and plan to initiate clinical development of IMO-9200, a second TLR antagonist drug candidate, during the second half of this year.

Advancing Gene-silencing Oligonucleotide Technology

We are very proud to have made pioneering contributions to the field of antisense. While the antisense approach has shown clinical proof-of-concept for multiple targets, we believe that to achieve broad applicability, issues related to delivery, immunotoxicity, and therapeutic index need to be improved. We believe our proprietary gene silencing oligonucleotide platform has the potential to address these issues and allows us to create **third generation antisense drug candidates**. During 2014, we plan to identify drug candidates for diseases with unmet medical needs, and advance them in clinical development in 2015.

Corporate

Over the last twelve months, we successfully raised approximately **$84 million** in gross proceeds to support the advancement of our pipeline of drug candidates.

Over the last year we have further strengthened our leadership team, bringing in key talent with experience in drug development and commercialization of novel therapies. In January of this year, we welcomed Dr. Lou Brenner as Senior VP and Chief Medical Officer. We are very pleased that Dr. Mark Goldberg, Mr. Julian Baker, and Dr. Kelvin Neu have joined our Board of Directors in recent months.

We at Idera are committed to bringing our novel therapies to patients with unmet medical needs as rapidly as possible. We have built a strong foundation with our novel scientific approach, our skilled team and our financial resources, to accomplish our stated goals.

Our colleagues join us in thanking you for your continued support of Idera.

Sincerely,

Sudhir Agrawal, D. Phil.,
Chief Executive Officer

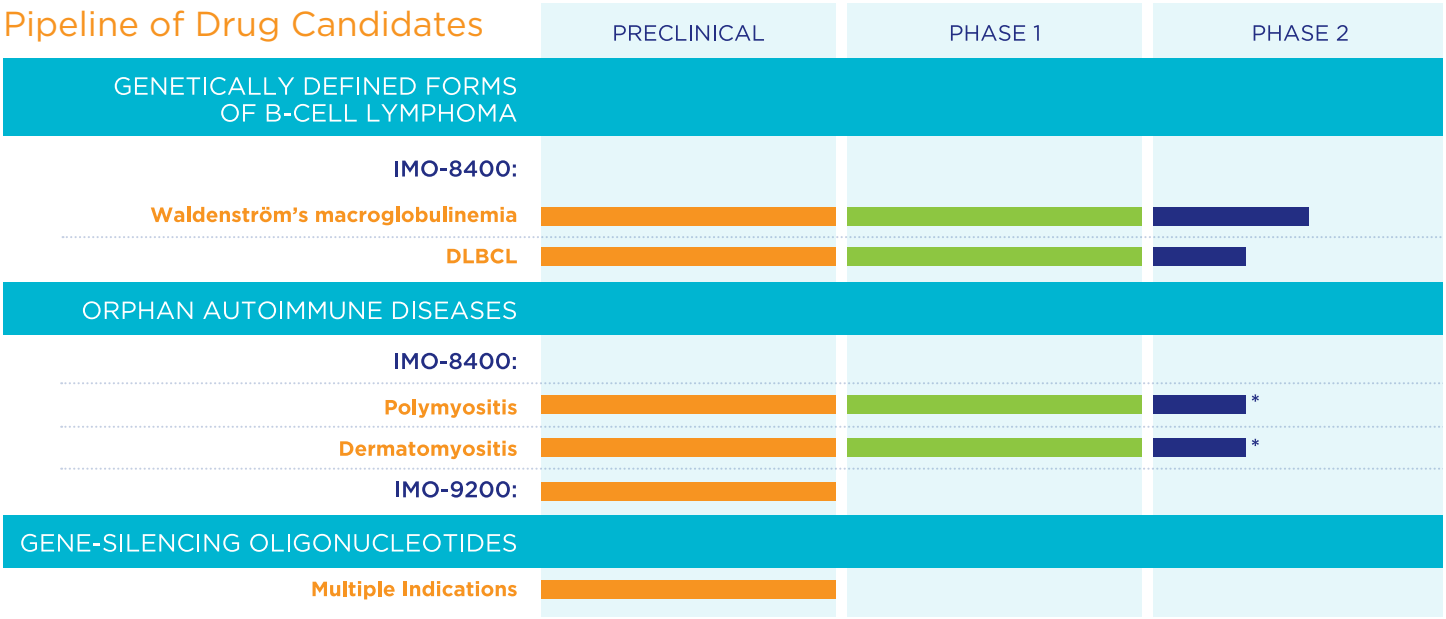
Jim Geraghty,
Chairman of the Board of Directors

April 17, 2014

Advancing a Deep and Diverse Clinical Stage Pipeline

Idera is pursuing two drug discovery platforms based on synthetic nucleic acids, which have resulted in a rich pipeline of novel drug candidates. Its Toll-like receptor (TLR) antagonists are designed to inhibit over-activation of TLRs 7, 8, and 9, which are implicated in diverse pathological conditions. Idera is currently developing IMO-8400 and IMO-9200 which are designed to block the over-activation of these specific TLRs. Idera's gene silencing oligonucleotides (GSOs) are designed to inhibit the production of disease-associated proteins by targeting RNA.

Pipeline of Drug Candidates



*enrollment to open second half of 2014

2011

Mutation discovered

Nature

2012

Mutation found in most patients with Waldenström's macroglobulinemia

New England Journal of Medicine

2013

April

Mutation reported to amplify TLR signaling

AACR Annual Meeting 2013

August

Cooperative research agreement

National Cancer Institute

A Year Filled with Value-Driving Milestones

2014 promises to be a pivotal year in the clinical development path of Idera Pharmaceuticals. Key milestones anticipated during the upcoming year include:

- Initiation of a Phase 1/2 trial of IMO-8400 in Waldenström's macroglobulinemia, a form of non-Hodgkin lymphoma. The trial is designed to evaluate IMO-8400's safety, tolerability and potential clinical activity in patients who have relapsed or failed to respond to one or more prior therapies. Patient treatment in the trial is ongoing.
- Initiation of a Phase 1/2 trial of IMO-8400 in patients with diffuse large B-cell lymphoma (DLBCL) harboring the MYD88 L265P mutation. Patient treatment is anticipated to begin in the second half of 2014.
- Initiation of clinical development of IM0-8400 for the treatment of patients with polymyositis and dermatomyositis, two orphan autoimmune diseases with high unmet clinical needs, in the second half of 2014. Both polymyositis and dermatomyositis have been designated as orphan diseases by the U.S. Food and Drug Administration (FDA). Based on the results from this study, Idera anticipates that it will pursue separate later-stage clinical trials for each indication.
- Advancement of IMO-9200 for potential use in selected autoimmune disease indications. Idera plans to submit an Investigational New Drug (IND) application to the FDA and initiate a Phase 1 trial for IMO-9200 in the second half of 2014.
- Announcement in the first half of 2015 of the first two candidates from its GSO platform for which Idera will pursue clinical development.

September

Idera preclinical validation

December

Idera clinical development initiated

2014

April

Idera reported preclinical data

AACR Annual Meeting 2014

Rapid Translation: Discovery to Development

Idera's path to the clinic in genetically defined forms of B-cell lymphoma

About **Idera Pharmaceuticals, Inc.**

Idera's proprietary technology involves creating novel nucleic acid therapeutics designed to inhibit over-activation of Toll-like receptors (TLRs). Idera is developing these therapeutics for the treatment of genetically defined forms of B-cell lymphoma and for autoimmune diseases with orphan indications. In addition to its TLR programs, Idera is developing its proprietary gene silencing oligonucleotides that it has created to inhibit the production of disease-associated proteins by targeting RNA.

Corporate Information

BOARD OF DIRECTORS

James A. Geraghty
Chairman of the Board

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

Julian C. Baker
Managing Partner, Baker Brothers Investments

Youssef El Zein
Managing Partner, Pillar Investment Limited

Mark Goldberg, M.D.
Senior Vice President for Medical and Regulatory Affairs for Synageva Biopharma

C. Keith Hartley
President, Hartley Capital Advisors

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

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

Kelvin M. Neu, M.D.
Managing Director, Baker Brothers Investments

Abude Omari
Managing Partner, Pillar Investment Limited

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

Eve E. Slater, M.D., F.A.C.C.
Former Senior Vice President for Worldwide Policy, Pfizer, Inc.,
Former Assistant Director, Department of Health and Human Services

MANAGEMENT

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

Louis J. Arcudi, III, MBA
Senior Vice President of Operations, Chief Financial Officer, Treasurer, and Secretary

Louis Brenner, M.D.
Senior Vice President and Chief Medical Officer

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

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

Kate Haviland
Vice President of Rare Diseases

STOCKHOLDERS' MEETING

The 2014 Annual Meeting of Stockholders will be held at the Company's offices at 167 Sidney Street, Cambridge, MA on June 9, 2014 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, 2013 as filed with the Securities and Exchange Commission, are available upon request to:

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- Toll Free Number: 1-877-206-1150
- TDD Hearing Impaired: 1-800-231-5469
- Foreign Stockholders: 1-201-680-6578
- TDD Foreign Stockholders: 1-201-680-6610

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INDEPENDENT AUDITORS

Ernst & Young, LLP
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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 28 in Idera's Annual Report on Form 10-K for the year ended December 31, 2013. Idera disclaims any intention or obligation to update any forward-looking statements.

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PHARMACEUTICALS

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