



**Advancing** a Novel Approach  
for the **Treatment** of  
Autoimmune Diseases

## About **Idera Pharmaceuticals, Inc.**

At Idera Pharmaceuticals we are developing a novel approach for the potential treatment of autoimmune and inflammatory diseases. Our novel approach involves blocking specific Toll-like Receptors (TLRs) with our drug candidates and thereby inhibiting disease associated production of multiple cytokines. Clinical proof-of-concept of our novel approach in patients with psoriasis has been established. This approach has potential applications in a broad range of autoimmune diseases including lupus, arthritis and other diseases.





## Advancing a Novel Approach for the Treatment of Autoimmune Diseases



Dear Stockholders,

**I am very pleased to report on the progress Idera has made over the past year to develop a new class of drug candidates to treat autoimmune diseases by modulating Toll-like receptors (TLRs). 2012 was a truly transformative year for Idera as we made important strides in the translation of our novel scientific rationale for the treatment of autoimmune diseases into meaningful clinical activity in patients.**

Most importantly, we believe that results from a Phase 2 trial that we conducted in 2012 provide proof of concept for TLR antagonism, our novel approach to treat autoimmune diseases, through the demonstration of clinical activity in patients with psoriasis. Psoriasis is an often debilitating disease that causes patients to experience significant disruptions in a normal lifestyle. In a Phase 2 trial of our first drug candidate, IMO-3100, which inhibits TLRs 7 and 9, we observed statistically significant improvements in psoriasis area severity index, or PASI scores, which is a validated clinical endpoint, after only four weeks of treatment.

Furthermore, fundamental improvements were observed in the underlying disease pathology through gene analysis of biopsies from patients in the trial conducted by our collaborator, Dr. James G. Krueger, M.D., Ph.D. of The Rockefeller University. The observation that gene-expression profiles associated with psoriasis were significantly improved in patients receiving our IMO-3100 is a strongly encouraging sign that the intended mechanism of action is functioning as expected and that it holds the promise to one day offer a truly novel option for patients.

*"TLR antagonism provides a novel mechanism of action for the potential treatment of patients with moderate to severe plaque psoriasis. Clinical activity demonstrated in this four-week proof-of-concept trial encourages further development of TLR antagonists over longer treatment periods,"* commented Alexa Kimball, M.D., M.P.H., Vice Chair, Department of Dermatology at Massachusetts General Hospital. (Idera Press Release May. 8, 2013)

These data have set the stage for us to advance our autoimmune disease program to the next stage of evaluation, by initiating a Phase 2 trial of IMO-8400 in patients with psoriasis. IMO-8400 is a first-in-class compound which inhibits TLRs 7, 8, and 9, and has demonstrated a favorable safety profile and the expected TLR engagement in Phase 1 trials. We believe the inclusion of TLR8 activity with IMO-8400 would further enhance the clinical activity observed with IMO-3100 in patients with psoriasis. In June, we announced the initiation of dosing in a Phase 2 trial of IMO-8400 in patients with moderate to severe plaque psoriasis. In this trial, we will evaluate over a 12-week treatment period the continued trajectory of PASI score improvement that we observed in the previous 4-week trial with IMO-3100. We expect to report the top-line results of this trial by year end 2013.

Our approach to the treatment of autoimmune diseases has broad applicability. IMO-8400 has shown impressive activity in various preclinical models of autoimmune diseases, including lupus and arthritis. Results from the ongoing Phase 2 trial in patients with psoriasis will inform our decisions for further development of IMO-8400 for psoriasis and other autoimmune disease indications.

IMO-8400 was created using our chemistry-based drug discovery platform that is the foundation of our Company. The same platform that creates development opportunities for Idera also yields opportunities for our corporate collaborators. Our ongoing partnership with Merck and Co. for the discovery and development of TLR-modulating compounds for use as vaccine adjuvants has yielded candidates that have been nominated for further evaluation.

The accomplishments of 2012 have reinforced our confidence in the potential for TLR antagonism as an important new mechanism for the treatment of autoimmune diseases, and we look forward to the results of the Phase 2 trial of IMO-8400 in psoriasis. We recently completed a \$16.5 million financing with the participation of experienced life science investors that has provided us with the means to conduct the Phase 2 study of IMO-8400 in psoriasis.

My colleagues join me in thanking you for your continued support. We are also thankful to the members of the Board of Directors for their dedication and guidance. I look forward to reporting our progress throughout the year.

Sincerely,

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

## PIPELINE OF DRUG CANDIDATES

	RESEARCH	LEAD CANDIDATE	PHASE 1	PHASE 2	
<b>AUTOIMMUNE DISEASES</b>					
<b>IMO-3100: TLR7 &amp; 9 ANTAGONIST</b>					
Psoriasis					
<b>IMO-8400: TLR7, 8, &amp; 9 ANTAGONIST</b>					
Psoriasis					
<b>VACCINE ADJUVANTS</b>					
<b>TLR7, 8, &amp; 9 AGONISTS</b>					
Cancer, Infectious Diseases, Alzheimer's Disease					Collaboration with Merck

## CORPORATE INFORMATION

### BOARD OF DIRECTORS

**Sudhir Agrawal, D. Phil., FRSC**

Chairman, Chief Executive Officer, and President

**William S. Reardon, CPA**

Lead Independent Director, Retired Audit Partner, PricewaterhouseCoopers, LLP

**Youssef El Zein**

Managing Partner, 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., FRSC**

Former Group Vice President, Schering-Plough

**Abude Omari**

Managing Partner, Pillar Investment Limited

**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**

Chairman, Chief Executive Officer, and President

**Louis J. Arcudi, III, MBA**

Senior Vice President of Operations, Chief Financial Officer, Treasurer, and Secretary

**Timothy M. Sullivan, Ph.D.**

Vice President, Development Programs and Alliance Management

**Robert D. Arbeit, M.D.**

Vice President, Clinical Development

**Steven J. Ritter, Ph.D., J.D.**

Vice President of Intellectual Property and Business Affairs

### STOCKHOLDERS' MEETING

The 2013 Annual Meeting of Stockholders will be held at the Company's offices at 167 Sidney Street, Cambridge, MA on July 26, 2013 at 10:00 a.m. ET. 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, 2012 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](mailto:ir@iderapharma.com)  
[www.iderapharma.com](http://www.iderapharma.com)

### REGISTRAR & TRANSFER AGENT

Computershare  
250 Royall Street  
Canton, MA 02021  
[www.computershare.com/investor](http://www.computershare.com/investor)  
• 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

### LEGAL COUNSEL

Wilmer Cutler Pickering Hale and 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 27 in Idera's Annual Report on Form 10-K for the year ended December 31, 2012 included in this Annual Report. Idera disclaims any intention or obligation to update any forward-looking statements.



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