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ANNUAL REPORT 2015

IderaPharma.com

FOUNDATIONS ESTABLISHED, EXECUTION AHEAD

Fellow Idera Shareholders,

Since joining Idera in December 2014, I've witnessed significant change and a great deal of progress within our company. This tangible progress has positioned us well to continue toward delivering approved therapeutic solutions for debilitating and often life-threatening cancers and rare diseases. We have evolved to be a development company with two exciting scientific platforms. The coming 12-18 months will be a defining time – many of our clinical trials will reach completion – moving us closer to pivotal registration studies and driving the company value that our investors expect. Let's take a moment to review some of the recent progress in each of our core development categories.

Immuno-Oncology

In 2015, we entered the immuno-oncology therapeutic category, moving even more swiftly than I expected. From our first meeting at MD Anderson in early 2015, we quickly progressed to initiation and dosing in the first clinical study of our alliance by year end. This rapid advancement is both uncommon and impressive, and speaks to both teams' enthusiasm for the potential of IMO-2125 in the fight against certain cancer malignancies. In 2016, the trial will continue as planned – we expect results that provide critical translational data outputs from within the treated and systemic tumor microenvironments and that inform selection of appropriate dosage for a Phase 2 portion of the study.

Simultaneously, we are identifying and planning future components of this program, focusing on additional tumor types and other checkpoint inhibitor combinations – both approved and emerging in clinical development.

Beyond IMO-2125, our research team continues to identify additional immuno-oncology approaches through both our Toll-like receptor (TLR) immune modulation and third-generation antisense (3GA) platforms. We look forward to those opportunities potentially maturing into development stage candidates.

Rare Diseases

Our efforts in the rare disease category focus on both autoimmune diseases and cancers, such as the B-cell malignancies for which we are developing IMO-8400. At the American Society of Hematology (ASH) conference in

late 2015, we announced the first clinical data for IMO-8400 in Waldenström's macroglobulinemia (WM), revealing that IMO-8400 showed signals of clinical activity along with a strong safety profile. Consequently, we began accelerating the program both in the WM and diffuse large B-cell lymphoma (DLBCL) studies to higher doses. With dose escalation and a targeted approach, we hope to see even greater clinical activity and employ IMO-8400 in the long-term treatment landscape for B-cell malignancies. We also are very excited to have initiated dosing in our clinical study of IMO-8400 in dermatomyositis late last year.

Third-Generation Antisense

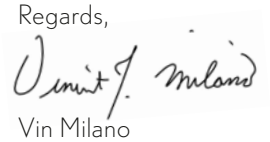
We are pleased to announce that in 2015 we successfully identified and named the first 2 gene targets from the 3GA platform, and also successfully forged our first collaboration with another pharmaceutical partner, GSK, to pursue certain renal targets. As it advances, the 3GA platform has the opportunity to serve in a meaningful way as an engine for our clinical development visions as well as for our capital position.

2016: A Year of Advancement

During this past year we made great advances, transitioning from an organization steeped in scientific endeavors to one that is now poised to advance those discoveries through clinical development and into the hands of physicians and patients.

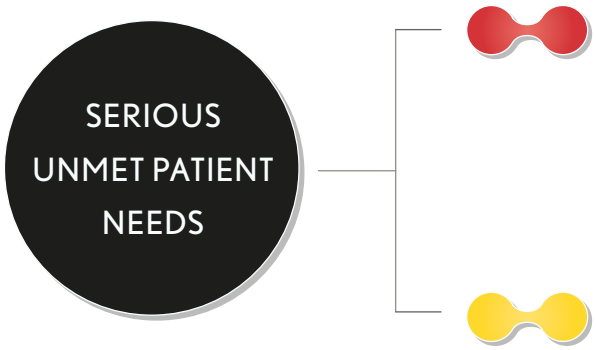
As we continue on the path of progress, we maintain our sole focus on the company's mission: to truly help patients. That unwavering focus drives us to seek new challenges and accomplish new goals. Together in 2016 we will execute on programs and continue developing approaches to redefine the treatment of certain cancers and rare diseases.

Regards,



Vin Milano
Chief Executive Officer, Idera Pharmaceuticals

TWO UNIQUE SCIENTIFIC PLATFORMS:
ENGINES FOR CONTINUOUS GROWTH AND CLINICAL DEVELOPMENT



TOLL-LIKE RECEPTOR IMMUNE MODULATION

Genetically defined forms of B-cell lymphoma

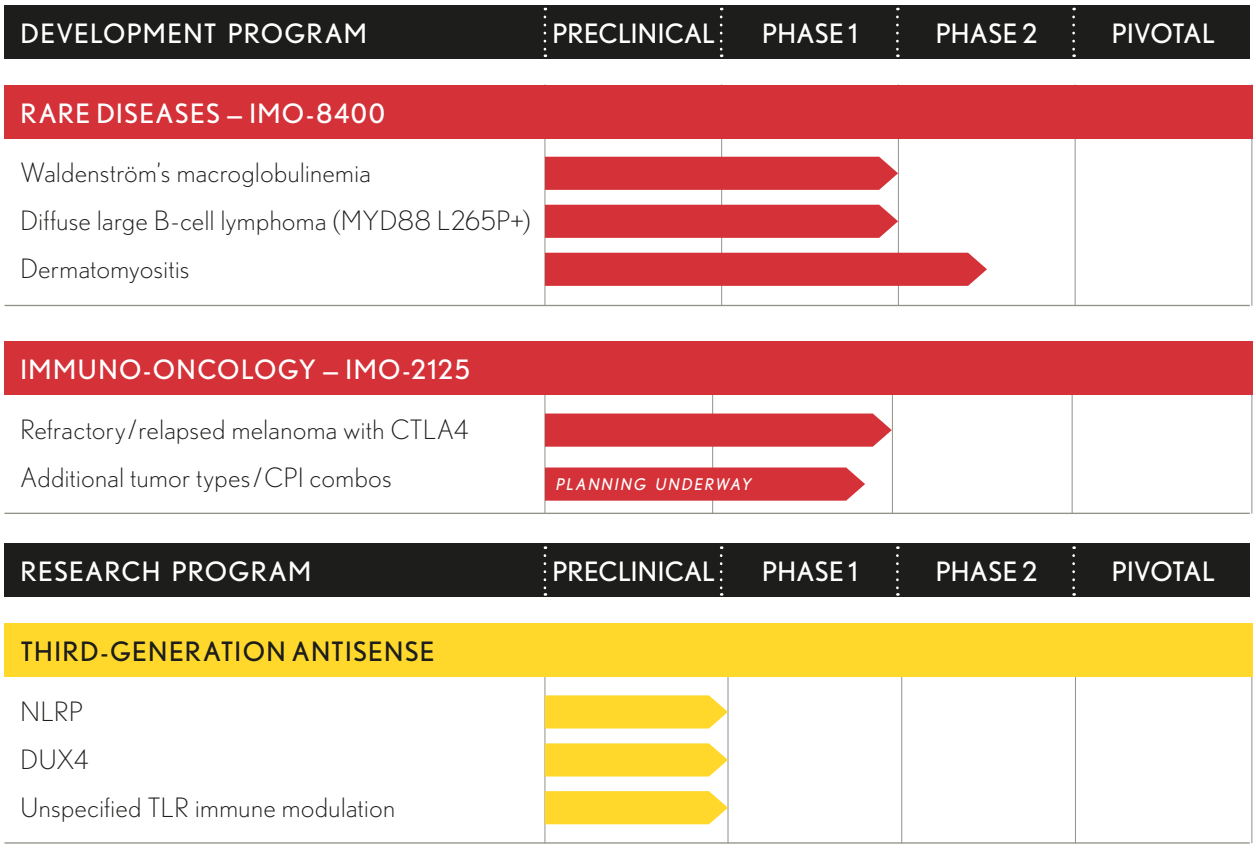
Rare diseases

Immuno-oncology

THIRD-GENERATION ANTISENSE (3GA)

Multiple targets in cancer and rare diseases

Broader applications for licensing opportunities



A LOOK BACK AT 2015:

FROM DISCOVERY TO CLINICAL DEVELOPMENT AND COMMERCIAL FOCUS

- Presented first positive IMO-8400 safety and efficacy data in B-cell malignancy target
- Initiated clinical studies in melanoma and dermatomyositis
- Named first gene targets for 3GA development platform
- Forged strategic research alliance with MD Anderson for immuno-oncology efforts
- Announced first collaboration for 3GA platform
- Instituted new corporate culture
- Rebuilt leadership team and strengthened employee base
- Raised significant capital to fund operations into third quarter of 2017

Idera Pharmaceuticals is a clinical-stage biopharmaceutical company developing novel nucleic acid–based therapies for the treatment of certain cancers and rare diseases. Idera's proprietary technology involves using a TLR-targeting technology to design synthetic oligonucleotide-based drug candidates to act by modulating the activity of specific TLRs.

In addition to its TLR programs, Idera has created a 3GA technology platform using its proprietary technology to inhibit the production of disease-associated proteins by targeting RNA.

BOARD OF DIRECTORS

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Youssef El Zein
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Vincent Milano
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LEADERSHIP TEAM

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Chief Financial Officer and Treasurer

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Robert Doody Jr.
Vice President, Corporate Communications
and Investor Relations

Clayton Fletcher
Senior Vice President, Business Development
and Strategic Planning

Joanna Horobin, MBChB
Senior Vice President, Chief Medical Officer

Vincent Milano
Chief Executive Officer

STOCKHOLDERS' MEETING

The 2016 Annual Meeting of Shareholders will be held at the Company's offices at 505 Eagleview Drive, Suite 212, Exton, PA, on June 13, 2016, at 3:00 PM 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, 2015, 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: 1-800-952-9245
- Foreign Stockholders: 1-201-680-6578
- TDD Foreign Stockholders: 1-781-575-4592

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INDEPENDENT AUDITORS

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COMMON STOCK SYMBOL

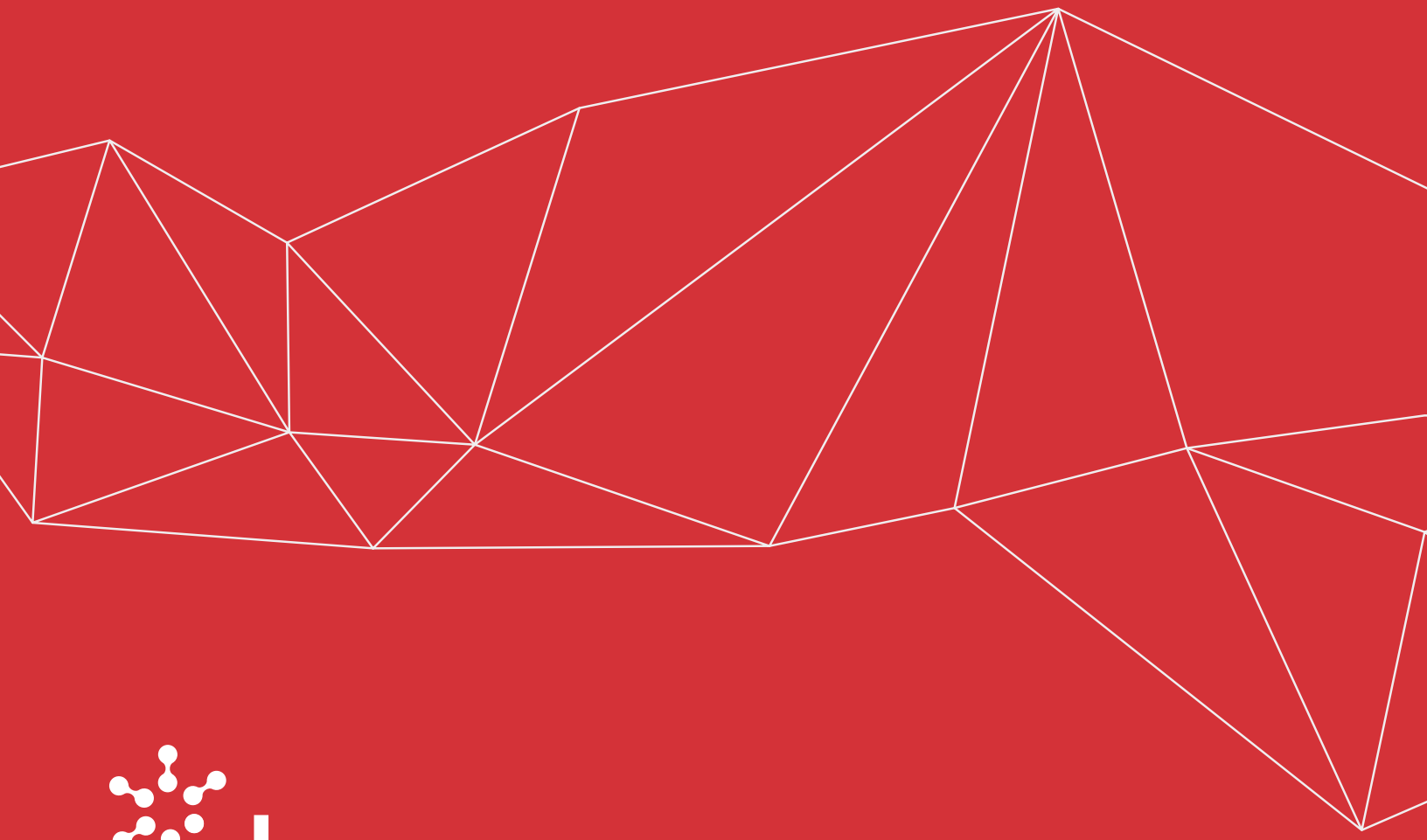
NASDAQ: **IDRA**

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" in Idera's Annual Report on Form 10-K for the year ended December 31, 2015. Idera disclaims any intention or obligation to update any forward-looking statements.

"The most successful organizations always have in common at their core, a strong set of values and clearly defined corporate culture. Over the past 15 months we've made great progress instituting those ideals, which will continually guide us as we drive forward into our company's bright future."

– Vin Milano



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