



IDERA'S PIPELINE

PARTNERED PROGRAMS

CANDIDATE	DISEASE	RESEARCH	PRECLINICAL	PHASE 1	PHASE 2	PARTNERS
IMO-2055 (TLR9 agonist)	Oncology <ul style="list-style-type: none"> Renal Cell Carcinoma (monotherapy) Non-small Cell Lung Cancer (+ Tarceva® and Avastin®) Colorectal Cancer (+ Erbitux® and Camptosar®) 	<div></div>	<div></div>	<div></div>	<div></div>	
QAX935 (TLR9 agonist)	Respiratory Diseases <ul style="list-style-type: none"> Asthma/Allergies 	<div></div>	<div></div>	<div></div>		
TLR7, 8, 9 agonists	As Vaccine Adjuvants for: <ul style="list-style-type: none"> Cancer, Infectious Diseases, Alzheimer's Disease 	<div></div>				

PROPRIETARY PROGRAMS

CANDIDATE	DISEASE	RESEARCH	PRECLINICAL	PHASE 1	PHASE 2
IMO-2125 (TLR9 agonist)	Infectious Diseases <ul style="list-style-type: none"> Hepatitis C Virus (monotherapy; HCV non-responders to SOC) Hepatitis C Virus (+ ribavirin; HCV treatment-naïve) 	<div></div>	<div></div>	<div></div>	
IMO-3100 (Lead TLR7 and TLR9 antagonist)	Autoimmune Diseases <ul style="list-style-type: none"> Lupus Rheumatoid Arthritis Multiple Sclerosis Psoriasis 	<div></div>	<div></div>	<div></div>	
TLR7 agonists	Oncology	<div></div>			
TLR8 agonists		<div></div>			
Dual TLR7/8 agonists		<div></div>			
TLR7 agonists	Infectious Diseases	<div></div>			
TLR8 agonists		<div></div>			
Dual TLR7/8 agonists		<div></div>			

D E A R S H A R E H O L D E R S ,

THROUGHOUT 2008 IDERA CONTINUED TO BUILD ON ITS SUCCESS AS A DRUG DISCOVERY AND DEVELOPMENT COMPANY FOCUSED ON TOLL-LIKE RECEPTORS, OR TLRs. TODAY THREE OF OUR DRUG CANDIDATES ARE IN CLINICAL EVALUATION FOR INDICATIONS OF CHRONIC HEPATITIS C VIRUS INFECTION, CANCER, AND ASTHMA/ALLERGIES, TWO OF WHICH ARE BEING ADVANCED UNDER COLLABORATIVE PROGRAMS. FURTHER, WE ARE IN THE PROCESS OF COMPLETING THE PRECLINICAL WORK NECESSARY TO PROGRESS A FOURTH DRUG CANDIDATE, TARGETING AUTOIMMUNE DISEASE INDICATIONS, INTO CLINICAL EVALUATION.

Our drug discovery strength comes from extensive experience in the design of nucleic acid based drug candidates. We design drug candidates to modulate immune responses mediated through TLRs, a family of key receptors in the immune system. Our pipeline now includes drug candidates that are antagonists of TLRs and have the potential to block harmful immune responses that occur in autoimmune and other diseases, as well as agonists of TLRs that activate immune responses which might be helpful in treating diseases such as viral infections, cancer and asthma/allergies, and for use as vaccine adjuvants.

Our business strategy is designed to enable multiple drug candidates to be developed for a broad range of clinical indications without Idera bearing sole development commitment and financial obligations for all the programs. We progress our discoveries into development of lead drug candidates through a balance of proprietary internal programs and collaborative licensed programs with Merck KGaA, Merck & Co., Inc., and Novartis. We are pleased to be working with each of our partners as they bring extensive scientific and developmental expertise and the resources to advance our TLR-targeted drug candidates in specified disease areas. The financial resources we receive under these collaborative agreements help Idera to focus on internal programs in other disease areas, such as infectious diseases and autoimmune diseases.

On behalf of our Board of Directors and my fellow Officers, I thank all Idera employees for the many contributions they make to our success. We also acknowledge the support of our shareholders, and we thank each one of you for your continued commitment.

We believe that the evolution of our science has positioned Idera for future growth. Over the course of the next two years, we expect that data from on-going clinical trials will drive important decisions on subsequent clinical opportunities in multiple therapeutic indications.

Sincerely,

A handwritten signature in blue ink, reading "Sudhir Agrawal".

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

IDERA'S SCIENCE

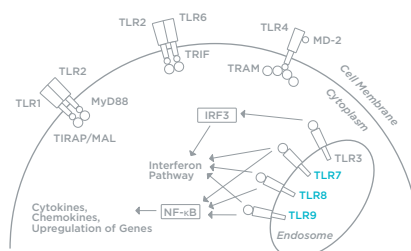
EXPERTISE IN NUCLEIC ACID CHEMISTRY DRIVES DISCOVERY

From its inception, Idera has focused on the discovery and development of DNA- and RNA-based drug candidates for the treatment of serious diseases. We have applied our expertise in nucleic acid chemistry to the creation of drug discovery platforms such as antisense technology and immune modulation through Toll-like Receptors, or TLRs.

TLRs comprise a family of receptors that are located on specific immune cells. As part of the immune system, they protect the body by responding to bacteria, viruses and other abnormalities. Activation of TLRs initiates a series of signals that induce an immune response.

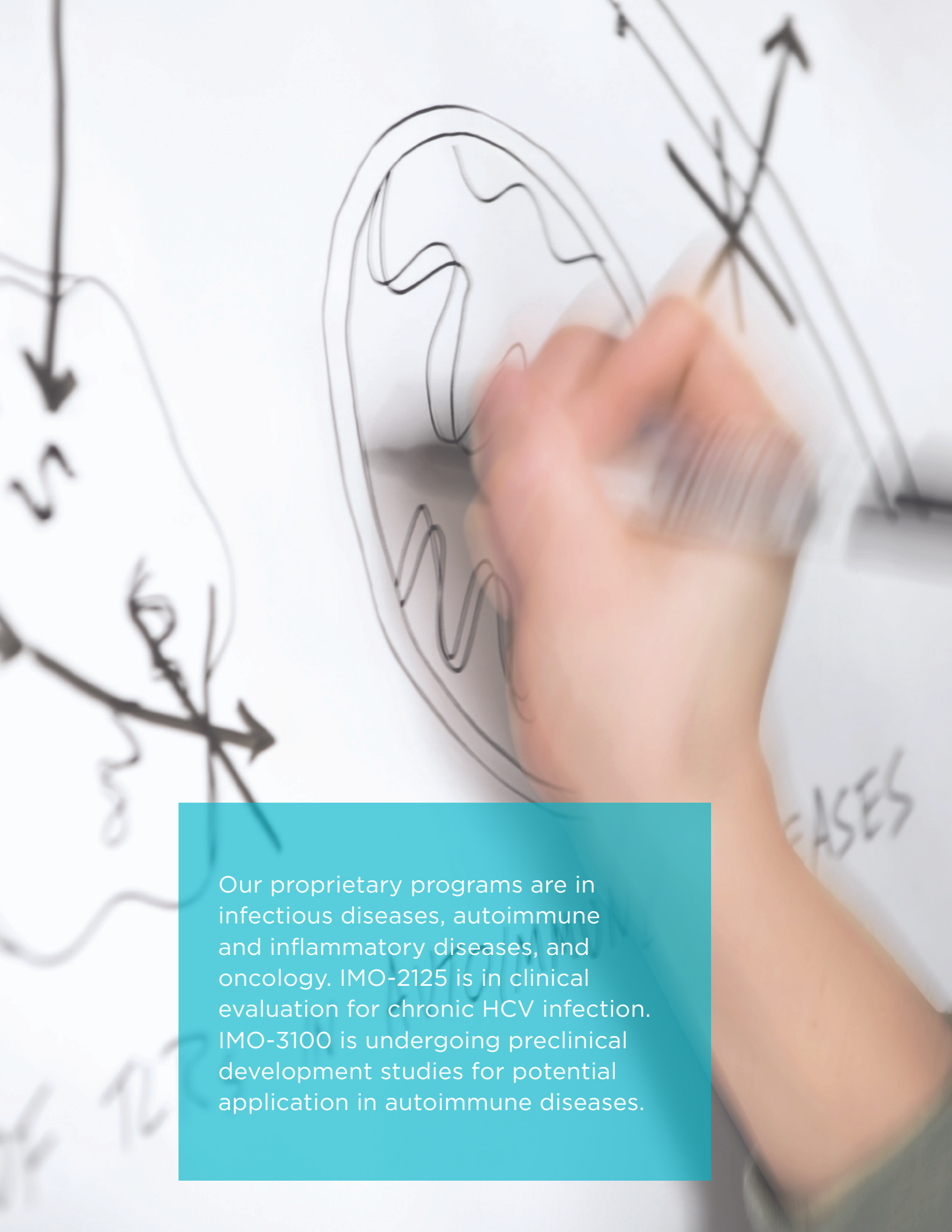
Our TLR-targeted compounds are designed to mimic the bacterial DNA and viral RNA that are recognized by TLRs 7, 8 or 9. Some of our compounds act as agonists and activate TLR7, 8 or 9 to induce an immune response. Others act as antagonists and block immune responses that are mediated through TLR7 and TLR9.

Idera's drug discovery programs target TLRs 7, 8 and 9, which are specific receptors present within immune system cells. These TLRs recognize the DNA or RNA of pathogens such as bacteria or viruses and initiate an immune response against them.





We are developing novel TLR-targeted drug candidates for the potential treatment of multiple diseases. We and our collaborators have on-going clinical evaluations in diverse therapeutic indications.



Our proprietary programs are in infectious diseases, autoimmune and inflammatory diseases, and oncology. IMO-2125 is in clinical evaluation for chronic HCV infection. IMO-3100 is undergoing preclinical development studies for potential application in autoimmune diseases.

IDERA'S PROPRIETARY PROGRAMS

Idera has an internal drug development pipeline comprised of proprietary programs in the fields of infectious diseases, autoimmune and inflammatory diseases, and oncology.

INFECTIOUS DISEASES

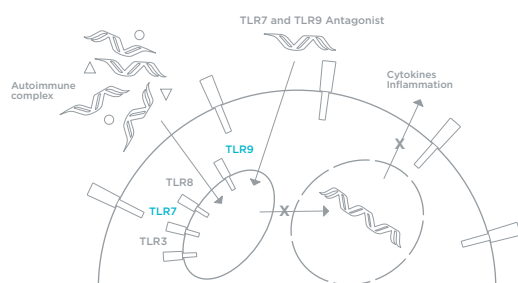
IMO-2125, an agonist of TLR9 that we are developing for the treatment of chronic hepatitis C virus (HCV) infection, is the most advanced drug candidate in our proprietary pipeline. Recombinant versions of interferon-alpha are important components of the standard of care for chronic HCV infection. Our objective in the design of IMO-2125 was to induce the production of interferon-alpha and other antiviral factors through the normal immune system process of TLR9 activation. We have shown in preclinical models that IMO-2125 induces high levels of interferon-alpha and other antiviral factors. We currently are assessing the safety of IMO-2125 in a Phase 1 clinical trial in patients who have not responded to standard of care treatment. We are planning a second Phase 1 clinical study with IMO-2125, in which IMO-2125 will be combined with ribavirin in patients with chronic HCV infection who have not received prior therapy.

AUTOIMMUNE AND INFLAMMATORY DISEASES

For the treatment of autoimmune and inflammatory diseases, we have identified IMO-3100, a dual TLR7 and TLR9 antagonist, as a lead drug candidate. We have evaluated IMO-3100 and other antagonist candidates in preclinical disease models of lupus, rheumatoid arthritis, multiple sclerosis, psoriasis, and colitis. We are currently conducting preclinical development studies of IMO-3100 and intend to initiate a subsequent clinical trial.

ONCOLOGY

We also have created a new class of RNA-based compounds that act as agonists of TLR7 and/or TLR8. We are expanding our preclinical evaluation of these TLR7 and/or TLR8 agonists with the goal of selecting a lead drug candidate for the treatment of cancer.



IMO-3100 is designed to block immune system activation mediated through TLR7 and TLR9. This class of compounds provides a novel approach to the potential treatment of autoimmune and inflammatory diseases.

IDERA'S PARTNERED PIPELINE

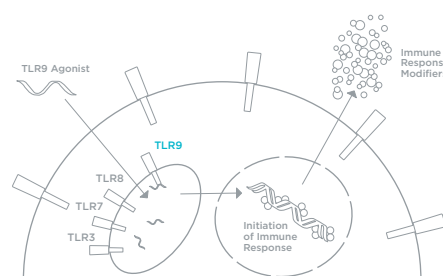
DELIVERING ON BUSINESS STRATEGY

Idera's TLR-targeted compounds have potential applications in infectious diseases, autoimmune and inflammatory diseases, cancer, and asthma/allergies, and for use as vaccine adjuvants. Our business strategy is to advance Idera's drug candidates in selected programs through licensing and collaboration agreements with pharmaceutical companies.

At present, we have collaborative programs with three pharmaceutical companies: Merck KGaA for cancer treatment; Merck & Co., Inc. for vaccine adjuvants; and Novartis for the treatment of asthma and allergies. These programs are being advanced under the scientific and development management of our collaborative partners. As these programs progress through various stages of development, Idera has the potential to earn milestone payments and, in the event of commercialization, royalty payments.

Drug discovery and development is a long process, starting with design, synthesis and screening, through identification of lead candidates, product development, clinical evaluation, and marketing. The process takes many years, the commitment of extensive resources, and risks at all stages in the process. Collaborations with large pharmaceutical companies provide development expertise and resources to advance selected applications of our science through the challenges of drug discovery and development.

Upon entering an immune cell, a TLR9 agonist induces immune responses. The type of immune response induced is dependent on the chemical structure of the agonist.





Our collaborators provide the necessary expertise and resources to manage the development and commercialization of drug candidates in the licensed fields of therapeutic applications.

THE HISTORY AND VISION OF IDERA



L-R: **James B. Wyngaarden**, M.D., Founding Board Member, Current Chairman of the Board, Former Director, National Institutes of Health; **Paul C. Zamecnik**, M.D., Founder, Current Board Member Emeritus, Retired Collis P. Huntington Professor of Medicine, Harvard Medical School, Recipient of Lasker Award and National Medal of Science; **Sudhir Agrawal**, D.Phil., Founding Scientist, Current President, CEO and CSO

Today Idera has a rich pipeline of TLR-targeted drug candidates that span a broad range of therapeutic applications. This achievement is due to our unwavering focus on applying nucleic acid chemistry expertise to create new drugs, beginning with our pioneering antisense research nearly two decades ago. We have translated the knowledge from our early efforts in antisense technology to create the TLR-targeted drugs that are now demonstrating great potential. As Idera scientists have learned more about TLR biology we are recognizing the added potential of antisense technology to modify immune responses. As always, Idera is committed to improving the lives of patients through a science-driven approach to the creation of new medicines.

Paul C. Zamecnik

Paul C. Zamecnik, M.D.

James B. Wyngaarden

James B. Wyngaarden, M.D.

Sudhir Agrawal

Sudhir Agrawal, D. PHIL.

BOARD OF DIRECTORS

James B. Wyngaarden, M.D.

Chairman of the Board

Sudhir Agrawal, D. PHIL.

President, Chief Executive Officer and Chief Scientific Officer

Youssef El Zein

Vice Chairman of the Board

Managing Partner, Pillar Investment Limited

C. Keith Hartley

President, Hartley Capital Advisors

Robert W. Karr, M.D.

Former Senior Vice President, Pfizer, Inc.

Hans Mueller, PH.D.

Former Senior Vice President, Wyeth Pharmaceuticals

William S. Reardon, CPA

Retired Audit Partner, PricewaterhouseCoopers, LLP

Alison Taunton-Rigby, PH.D.

Chairman and Chief Executive Officer, RiboNovix, Inc.

Director Emeritus

Paul C. Zamecnik, M.D.

Collis P. Huntington Professor Oncologic Medicine, Emeritus,
Harvard Medical School

Senior Scientist, Massachusetts General Hospital

MANAGEMENT

Sudhir Agrawal, D. PHIL.

President, Chief Executive Officer and Chief Scientific Officer

Louis J. Arcudi, III, MBA

Chief Financial Officer, Treasurer and Secretary

Alice S. Bexon, MBCHB

Vice President, Clinical Development

Timothy M. Sullivan, PH.D.

Vice President, Development Programs

Ekambar R. Kandimalla, PH.D.

Vice President, Discovery

Steven J. Ritter, PH.D., J.D.

Vice President, Intellectual Property and Contracts

David M. Lough, PH.D.

Director, Business Development and Alliance Management

Frank Whalen, CPA, MBA

Controller

STOCKHOLDERS' MEETING

The 2009 Annual Meeting of Stockholders will be held at Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, MA on June 16, 2009 at 10:00 AM 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, including the Company's Annual Report on Form 10-K for the year ended December 31, 2008, as filed with the Securities and Exchange Commission, are available upon request to:

Investor Relations
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167 Sidney Street
Cambridge, MA 02139

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Phone: 617.679.5519
Email: ir@iderapharma.com

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Jersey City, NJ 07310-1900
Web: 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 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 constitute 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 18 in Idera's Annual Report on Form 10-K for the year ended December 31, 2008 included in this Annual Report. Idera disclaims any intention or obligation to update any forward-looking statements.



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