2012
ANNUAL
REPORT

Using big science to answer big questions.

ALLEN INSTITUTE *for* BRAIN SCIENCE
Fueling Discovery

What makes us human?

The power of the human brain is unmatched by even today's most advanced computing technologies. Decoding the brain's mysteries is essential to understanding the human condition and to improving human health.

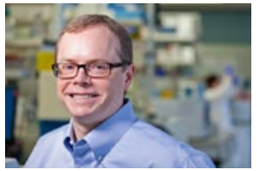
2012 Highlights

- Approved 10-year plan for expansion and new scientific initiatives, and received a new $300M commitment from Paul G. Allen to support Phase I of the plan
- Published landmark study on the human brain in *Nature*
- Expanded scientific leadership and team with 14 Ph.D.-level scientists from Harvard, Stanford and other world-class organizations
- Generated ~1 petabyte of new data on the human brain, neural circuitry and brain development for its online public resources
- Increased usage of the Allen Brain Atlas resources to nearly 900,000 visits from scientists more than 125 countries

We are dedicated to accelerating brain research, using big science to drive the field forward. Our success enables scientists around the world to answer critical questions about the development, structure, and function of the brain, and to use those answers to improve human health.

"The Allen Institute is transforming brain science around the world. In the last decade, the Institute has successfully tackled industrial scale science projects, delivering massive databases with an open public approach that thousands of scientists use to advance their research every day. I am excited to help the Institute build on these achievements and expand the scale and scope of its impact."

Paul G. Allen
Founder



Allan Jones, Ph.D.
Chief Executive Officer

"In 2012, we turned our focus from our achievements to date to the opportunities that lie ahead. The launch of our ambitious 10-year plan sets us on a course to further transform brain research, both within our own walls and in collaboration with the global brain science community."

‘03 ‘04 ‘05 ‘06 ‘07 ‘08 ‘09 ‘10 ‘11 ‘12

COMMUNITY

PUBLIC RESOURCE S

BUSINESS

>25,000 visits to Allen Brain Atlas resources (all 2005)

ALLEN **Mouse Brain Atlas** [Completed 2006]

Sleep Study [Completed 2008]

Human Cortex Study, the Allen Institute’s first human project and a critical foundation for generating the Allen Human Brain Atlas. [Completed 2009]

>250,000 visits to Allen Brain Atlas resources (all 2008)

ALLEN **Spinal Cord Atlas** created in response to requests from the research community and funded by a consortium of contributors including foundations, individuals, disease organizations, and corporate entities. [Completed 2009]

ALLEN **Developing Mouse Brain Atlas** [Completed 2010]

Transgenic Mouse Study

>500,000 visits to Allen Brain Atlas resources (all 2009)

Mouse Diversity Study [Completed 2009]

NIH Blueprint Non-Human Primate (NHP) Atlas

Held the First Annual Allen Institute Symposium This new model of symposium integrates diverse topics and top experts to stimulate collaborative and forward-thinking discussion. Distribution of videos publicly online expands benefit to the global research community.

ALLEN **Human Brain Atlas**

BrainSpan Atlas of the Developing Human Brain

Ivy Glioblastoma Atlas Project

>750,000 visits to Allen Brain Atlas resources (all 2011)

ALLEN **Mouse Brain Connectivity Atlas**

First Allen Brain Atlas Hackathon brings programmers and informatics experts together to collaborate on developing new data analysis strategies and tools based on the Allen Brain Atlas resources.

Approval of 10-year plan sets the course for expanded opportunities and scientific endeavors. New initiatives launched in neural coding, molecular networks, and characterization of different brain cell types.

Reached 200 Employees

Received $300M commitment from Paul G. Allen for next four years bringing his total commitment to date to $500M.

Received $100M seed commitment from Paul G. Allen

Launched operations

Reached 100 Employees

Received largest federal grant award to date ($16.2M)

Christof Koch, Ph.D. named CSO following a highly successful 25-year career at the California Institute of Technology. Initiates expansion of the Institute’s scientific team by recruiting top scientists from around the world.

Where do we begin?

Launched in 2003, the Allen Institute has forever changed the trajectory of brain research in less than 10 years. We intend to build on this successful foundation to catalyze breakthrough discoveries and accelerate knowledge acquisition in brain science in the years ahead.

Why do we need big science?

Deciphering the complexity of the human brain is a tremendous challenge, one that cannot be solved by any single experiment or individual laboratory.

Our approach to brain research is as big as the challenge itself, combining our internal expertise and capabilities with global collaboration to enable problem solving among researchers around the world. We are innovating tools and techniques that can be used to generate, capture, analyze, and share data on an unprecedented scale. Our commitment to making our innovations publicly available is a catalyst for advancing diverse areas of brain research. The whole of the knowledge base that is being built on the foundation of our work is greater than the individual experiments that we enable. The ongoing financial support of our founder, Paul G. Allen, and leading grant organizations including the National Institutes of Health validates our big science approach and provides critical funding for making our impact even greater.

John Phillips, Ph.D.
Executive Director, Structured Science

"We are using an industrial model of cross-disciplinary problem solving to answer critical questions in brain research, and to develop cutting-edge technologies that overcome new research challenges."

We believe that providing researchers around the world with ready access to our data and online tools is the most effective way to spur progress in brain science. Our commitment to making our resources available to the research community establishes a benchmark for open and collaborative science.

The resources that we have created to date are tangible evidence of our ability to innovate new technologies. Today we are developing new cell lines, transgenic tools, models, methods, and computer algorithms that will allow scientists around the world to ask and answer wholly new questions in brain science.

"Our structured approach to brain science differentiates us from conventional research organizations.

Amy Bernard, Ph.D.
Director, Structured Science

We pursue defined projects, setting goals and developing an execution plan to answer the most challenging questions in brain research."

>4 million visits to Allen Brain Atlas resources to date, with nearly **50,000 researchers** at academic, corporate, government, and nonprofit organizations from more than **125 countries** across six continents visiting our online resources each month.

"What's most gratifying to me when I train scientists to use our resources is helping them find new features that can significantly speed their research. I love seeing that light bulb go on."

— Terri Gilbert, Ph.D., Application Scientist, Allen Institute for Brain Science

"This will likely become the reference atlas for molecular and cellular neuroscientists."

— Thomas R. Insel, M.D., Director, National Institute of Mental Health, in *Nature*

"By using the Allen Spinal Cord Atlas, we were able to discover a brand new cell type that has previously been overlooked and that could be an important player in all manner of spinal cord injury and disease, including multiple sclerosis and ALS."

— Jane Roskams, Ph.D., Professor of Zoology, University of British Columbia

"I use the Allen Mouse Brain Atlas in my work everyday. We've conducted phenotypic analysis of mouse mutants, which have identified epilepsy genes in 20 mouse models."

— Jeffrey Noebels, M.D., Ph.D., Professor of Neurology, Neuroscience, and Molecular and Human Genetics, Vice Chair for Research, Department of Neurology, Baylor College of Medicine

Training programs span the globe

UNITED STATES

Baylor College of Medicine
California Institute of Technology
Columbia University
Duke University
Genentech
Georgetown University
Harvard University
Massachusetts Institute of Technology
Mount Sinai School of Medicine
National Institutes of Health
Princeton University
Salk Institute for Biological Studies
Stanford University
The Scripps Research Institute
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Diego
University of California, San Francisco
University of North Carolina
University of Southern California
University of Texas at Austin
University of Texas Southwestern Medical Center

UNITED KINDOM

Cambridge University
Kings College London
University of Oxford

SWEDEN

Karolinska Institutet

FINLAND

University of Helsinki

GERMANY

Center for Regenerative Therapies Dresden
Humboldt Universitat
Max Planck Institute for Human Cognitive and Brain Sciences

JAPAN

Okinawa Institute for Science and Technology

WEBINAR TRAINING ATTENDEES

Belgium
Brazil
Canada
China
Columbia
Denmark
Finland
France
India
Israel
Italy
Korea
Lebanon
New Zealand
Singapore
Sweden
United Kingdom
United States

Who benefits from our work?

Our publicly available resources have a truly global impact on brain research. Around the world and across multiple disease areas, our data and tools make a difference. And we are leading the charge to gather, analyze, and share brain research data on a massive scale.

Our resources can enable advances in all aspects of brain research, including behavior, anatomy, physiology, and brain disorders.

- Addiction
- ADHD
- Autism
- Alzheimer's Disease
- Avian Influenza H5N1
- Bipolar Disorder
- Brain Development
- Brain Evolution
- Cancer
- Depression
- Diabetes
- Epilepsy
- Hypothyroidism
- Hypomyelination/Myelin Deficiencies
- Huntington's Disease
- Infantile Encephalopathy
- Intellectual Disability
- Metabolic Disorders
- Multiple Sclerosis
- Neuroinflammation
- Obesity
- Pain
- Psychiatric & Neurological Diseases
- Parkinson's Disease
- Schizophrenia
- Spinal Cord Injury
- Spinocerebellar Ataxia Type 3
- Stroke
- Traumatic Brain Injury
- Williams-Beuren Syndrome
- And More...

In 2012 alone, we generated nearly one petabyte (PB) (1,000 terabytes) of data — that is the equivalent of 60,000 HD movies. Since 2005, we have generated 230 million human microarray data points, and generated and processed more than 2PB of data. An end-to-end stack of the slides containing the nearly 2 million tissue sections that we have collected to date would span 42 miles. The combined thickness of the tissue sections collected in 2012 alone is 30.9 feet — just slightly below the average length of a *Tyrannosaurus rex*.

Where do we go from here?

Our initial achievements have allowed us to attract an exceptional roster of scientific leaders in a variety of disciplines.

Combined with the new $300 million commitment from our founder, Paul G. Allen, and financial support from federal funding agencies and other granting institutions, we have the critical intellectual and capital resources we need for success in our second decade.

In 2012 we implemented a 10-year plan that will expand the scale of our efforts, the scope of our impact, and our physical infrastructure. In 2013 we expect to break ground on a new building that will consolidate all of our personnel into a single space that will enhance our multi-disciplinary approach to brain research.

Our ongoing commitment to innovating cutting-edge technologies and sharing our unique resources with the global scientific community should enable wholly new endeavors in brain science. We look forward to answering important questions, and to asking even bigger ones.

The key initiatives of the 10-year plan encompass three critical questions:

- **How does the brain drive physiology and behavior?**
- **What drives neural development and disease processes?**
- **What roles do different neural components play in health and disease?**

Our top-notch scientific team works collaboratively to answer the most complex questions in brain research

Christof Koch, Ph.D.
Chief Scientific Officer

"The Allen Institute offers an absolutely unique opportunity to do something on a scale and with a ruthless focus unheard of in a traditional research setting. The opportunity to participate in such a transformative effort drives world-class scientists to join our organization."

Clay Reid, M.D., Ph.D.
Degree: Cornell University, The Rockefeller University
Prior Affiliation: Harvard University
Program Area: Neural Coding

Hanchuan Peng, Ph.D.
Degree: Southeast University, Nanjing, China
Prior Affiliation: Janelia Farm Research Campus, HHMI
Program Area: Neural Coding, Cell Types

Thomas Keenan, Ph.D.
Degree: University of Washington
Prior Affiliation: University of Wisconsin
Program Area: Molecular Networks, Cell Types, Neural Coding

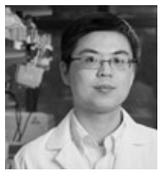
Stefan Mihalas, Ph.D.
Degree: Caltech
Prior Affiliation: Johns Hopkins University
Program Area: Neural Coding, Cell Types

Severine Durand, Ph.D.
Degree: University of Zurich, Switzerland
Prior Affiliation: Harvard University
Program Area: Neural Coding

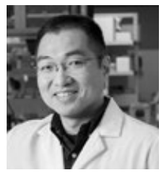
Nicholas Cain, Ph.D.
Degree: University of Washington
Prior Affiliation: University of Washington
Program Area: Neural Coding

Saskia de Vries, Ph.D.
Degree: Harvard University
Prior Affiliation: Stanford University
Program Area: Neural Coding

Michael Buice, Ph.D.
Degree: University of Chicago
Prior Affiliation: University of Texas at Austin
Program Area: Neural Coding

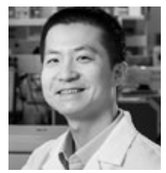


Lu Li, Ph.D.
Degree: Vanderbilt University
Prior Affiliation: UC Berkeley
Program Area: Cell Types



Kenji Mizuseki, M.D., Ph.D.
Degree: Kyoto University, Japan
Prior Affiliation: New York University
Program Area: Neural Coding

Jim Berg, Ph.D.
Degree: Harvard Medical School
Prior Affiliation: UCSF
Program Area: Cell Types



Chaoyang Ye, Ph.D.
Degree: University of Missouri, Columbia
Prior Affiliation: University of Pennsylvania
Program Area: Molecular Networks

Aleena Garner, Ph.D.
Degree: UC San Diego
Prior Affiliation: UC San Diego
Program Area: Neural Coding

Corinne Teeter, Ph.D.
Degree: UC San Diego
Prior Affiliation: Sandia National Laboratories
Program Area: Neural Coding, Cell Types

In 2012 we welcomed 14 world-class scientists to our team

Financial Information

Allen Institute for Brain Science
Summary Balance Sheets

(in thousands)

	Year Ended December 31, 2012	2011
Current Assets		
Cash and cash equivalents	**$ 18,267**	$ 55,115
Restricted cash	**573**	212
Federal grants receivable	**1,217**	406
Pledges receivable	**47,000**	100
Other current assets	**2,219**	2,131
Total current assets	**69,276**	57,964
Restricted cash	**1,082**	1,073
Other non-current assets		400
Property and equipment,net	**11,110**	10,562
Total assets	**$ 81,468**	$ 69,999
Current Liabilities		
Accounts payable	**$ 2,758**	$ 1,580
Accrued expenses	**1,479**	1,211
Total liabilities	**4,237**	2,791
Net Assets		
Unrestricted	**75,521**	14,023
Temporarily restricted	**1,710**	53,185
Total net assets	**77,231**	67,208
Total liabilities and net assets	**$ 81,468**	$ 69,999

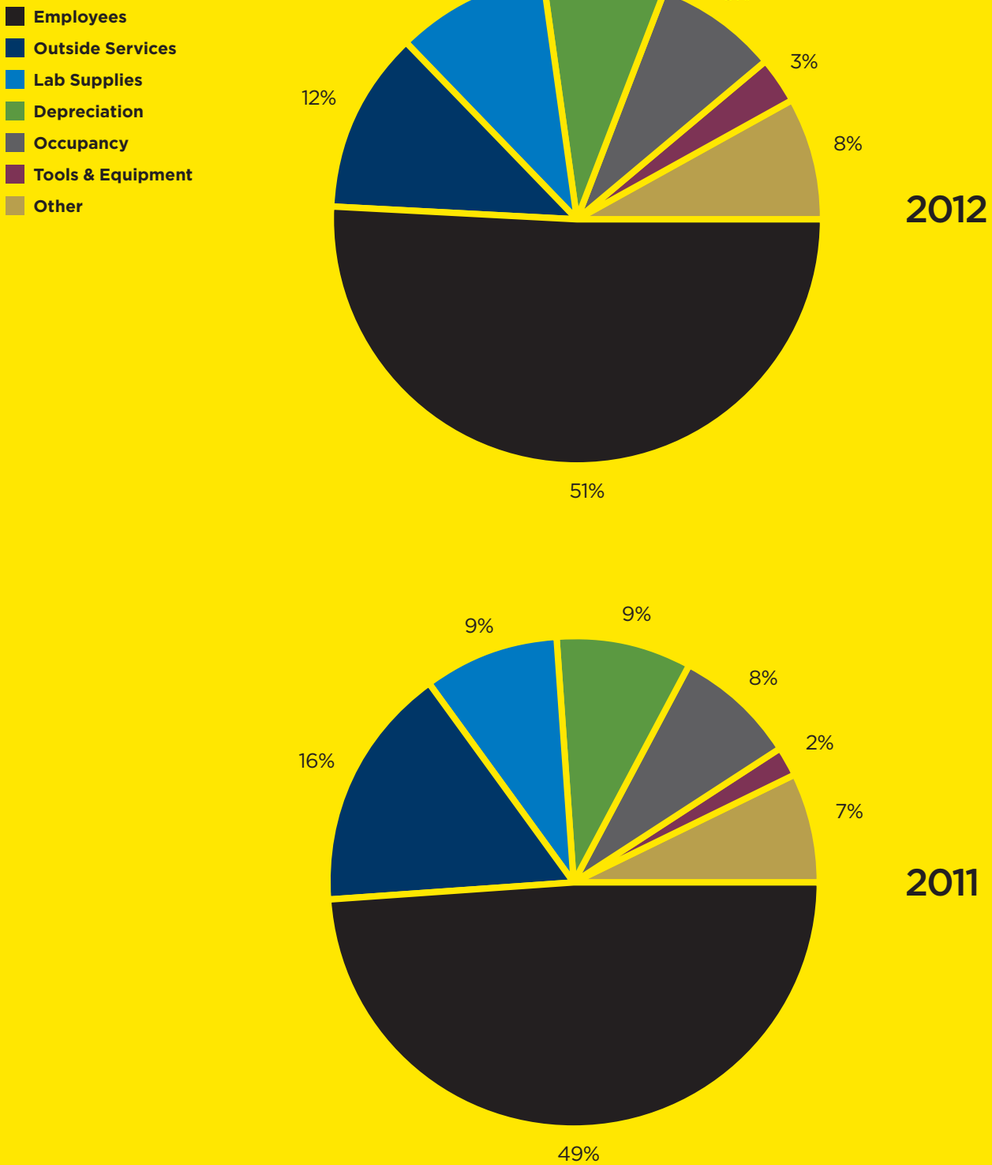
Allen Institute for Brain Science
Summary Income Statements

(in thousands)

	Year Ended December 31, 2012	2011
Support and Revenue		
Contributions	**$ 47,000**	$ 70,400
Federal and other grants	**4,888**	9,732
Other revenue	**195**	248
Total support and revenue	**52,083**	80,380
Expenses		
Program services	**35,303**	28,942
Management and general	**6,757**	5,671
Total expenses	**42,060**	34,613
Change in net assets	**$ 10,023**	$ 45,767

This information was derived from the annual audited financial statements.

Expense Distribution



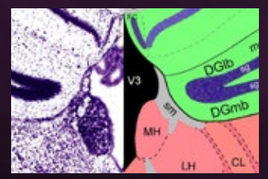
How do we enable others?

Our goundbreaking discoveries and research tools provide brain researchers around the world with truly innovative ways to ask and answer big questions in brain science.

In 2004 we launched the first of our Allen Brain Atlas resources, forever changing the way in which brain research could be conceptualized and conducted.

Since then, we have built a highly valuable suite of publicly available, web-based research tools encompassing multiple species, developmental stages, anatomical structures, and brain-related diseases. Any researcher with an Internet connection can access these resources freely through a single data portal. Our tools enable scientists to work more quickly and make more effective decisions, allowing them to focus on their most promising discoveries.

With more than 4 million visits to date, our online resources have supported many thousands of experiments and are cited routinely in peer-reviewed publications. Our sought-after transgenic mouse lines are also publicly available, and we are generating additional resources to support a variety of laboratory and computational studies that have not previously been feasible.



Our Team

Founders

Paul G. Allen

Jody Allen

Leadership

Allan Jones, Ph.D.
Chief Executive Officer

Chinh Dang
Chief Technology Officer

Christof Koch, Ph.D.
Chief Scientific Officer

David Poston
Chief Operating Officer

Board of Directors

Jody Allen
President and Board Chair, Allen Institute for Brain Science
President and CEO, Vulcan Inc.

Nathaniel T. Brown
Senior Vice President, Finance and Financial Strategy, The Seattle Times

Susan M. Coliton
Vice President, Foundation & Collections, Vulcan Inc.

Allen D. Israel
Member, Foster Pepper PLLC

Stephen Hall
Managing Director, Venture Capital, Vulcan Inc.

Thomas Daniel, Ph.D. (2011-present)
Professor of Biology, Neurobiology & Behavior, Komen Endowed Chair, University of Washington

Scientific Advisory Board

David Anderson, Ph.D.
California Institute of Technology

György Buzsáki, M.D., Ph.D.
Rutgers University

Edward M. Callaway, Ph.D.
Salk Institute for Biological Studies

Thomas L. Daniel, Ph.D.
University of Washington

Catherine Dulac, Ph.D.
Harvard University

Daniel H. Geschwind, M.D., Ph.D
University of California, Los Angeles

Michael P. Stryker, Ph.D.
University of California, San Francisco

Marc Tessier-Lavigne, Ph.D.
The Rockefeller University

David C. Van Essen, Ph.D.
Washington University

Additional Scientific Advisors

Larry Abbott, Ph.D.
Columbia University

Yang Dan, Ph.D.
University of California, Berkeley

Michael Elowitz, Ph.D.
California Institute of Technology

Adrienne Fairhall, Ph.D.
University of Washington

Anne Claude Gavin, Ph.D.
European Molecular Biology Laboratory

Richard Gibbs, Ph.D.
Baylor College of Medicine

Patrick Hof, M.D.
Mount Sinai School of Medicine

Arnold Kriegstein, M.D., Ph.D.
University of California, San Francisco

John H.R. Maunsell, Ph.D.
Harvard Medical School

David McCormick, Ph.D.
Yale University

Markus Meister, Ph.D.
Harvard University

Randall Moon, Ph.D.
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Mount Sinai School of Medicine

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Sloan-Kettering Institute

Karel Svoboda, Ph.D.
Howard Hughes Medical Institute, Janelia Farm Research Campus

Doris Tsao, Ph.D.
California Institute of Technology

David Tank, Ph.D.
Princeton University

Giulio Tononi, M.D. Ph.D.
University of Wisconsin – Madison

Christopher Walsh, M.D., Ph.D.
Harvard Medical School

Past Scientific Advisors

Gregor Eichele, Ph.D.
Max Planck Institute for Biophysical Chemistry

Eberhard Fetz, Ph.D.
University of Washington

Joshua Huang, Ph.D.
Cold Spring Harbor Laboratory

Edward Jones, M.D., Ph.D.
University of California, Davis

Alexandra Joyner, Ph.D.
New York University School of Medicine

Sacha Nelson, M.D., Ph.D.
University of California, San Diego

Steven Paul, M.D.
Weill Cornell Medical College

Luis Puelles, M.D., Ph.D.
University of Murcia

Larry Swanson, Ph.D.
University of Southern California

Joseph Takahashi, Ph.D.
University of Texas Southwestern Medical Center

Arthur Toga, Ph.D.
University of California, Los Angeles

Phyllis Wise, Ph.D.
University of Washington

Staff

More than 200 dedicated employees

More than 55 researchers with Ph.D. degrees

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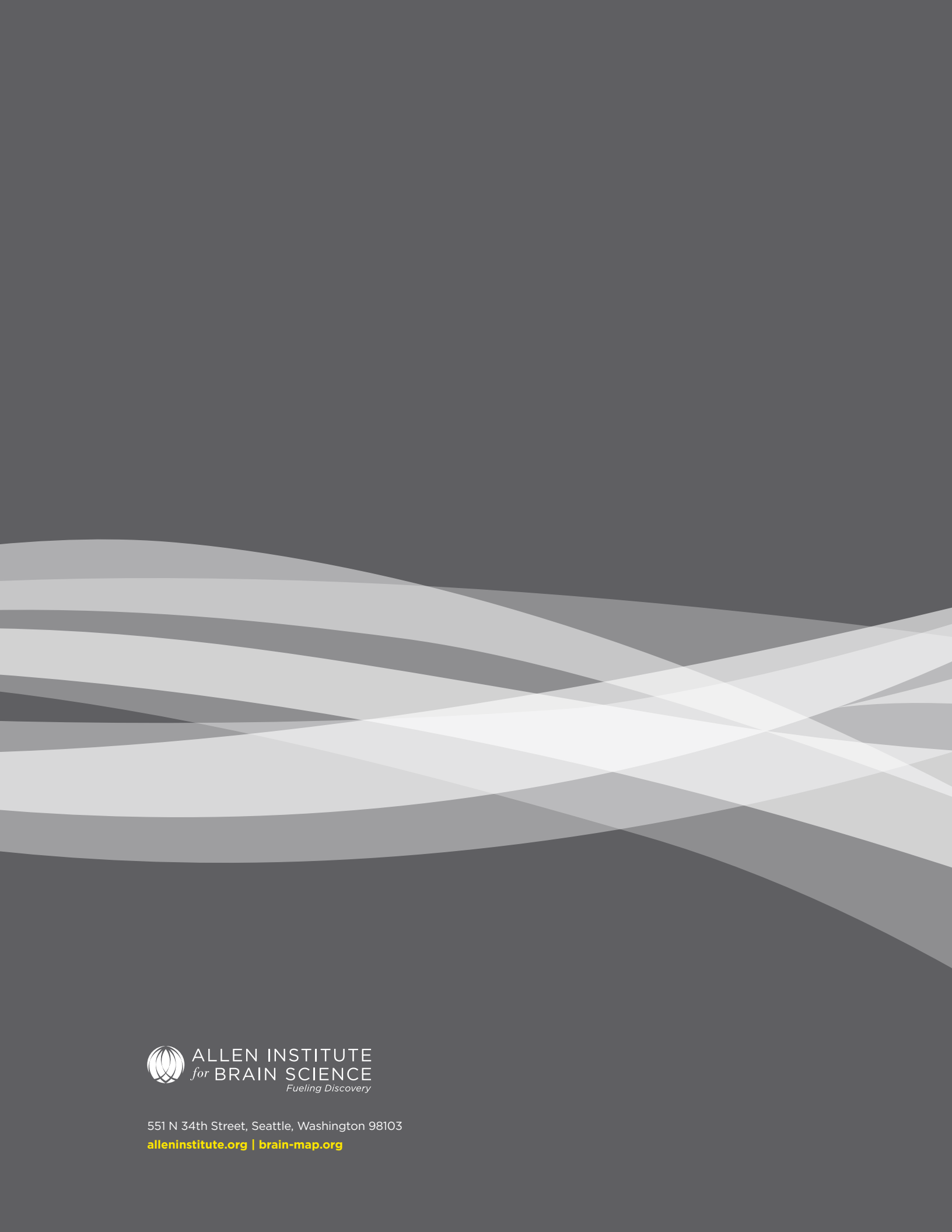

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Fueling Discovery

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