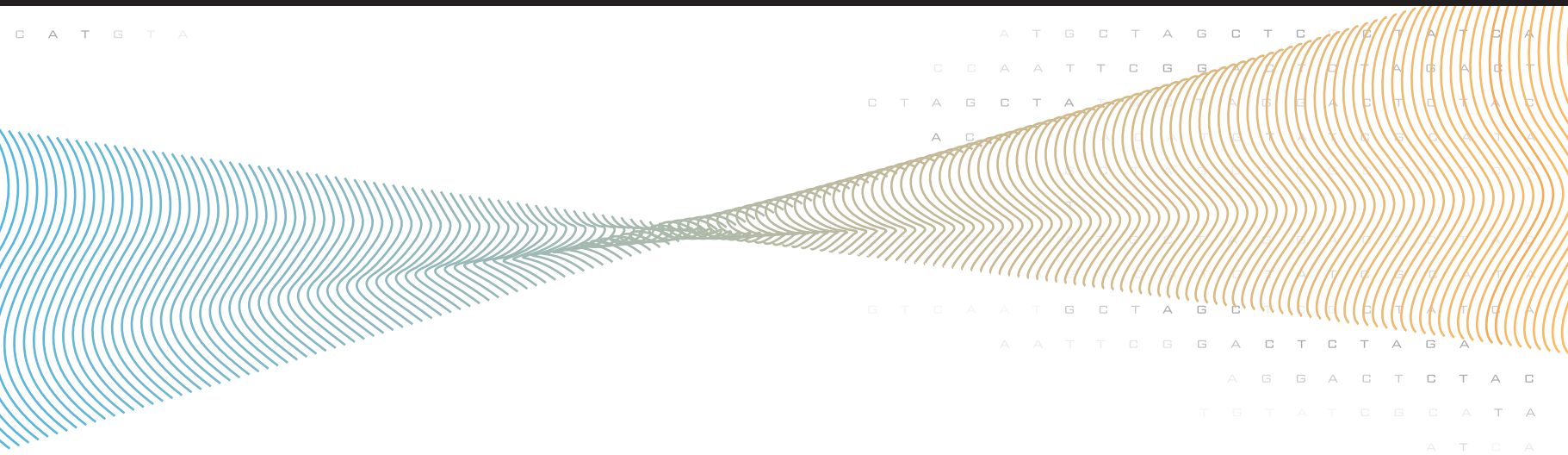
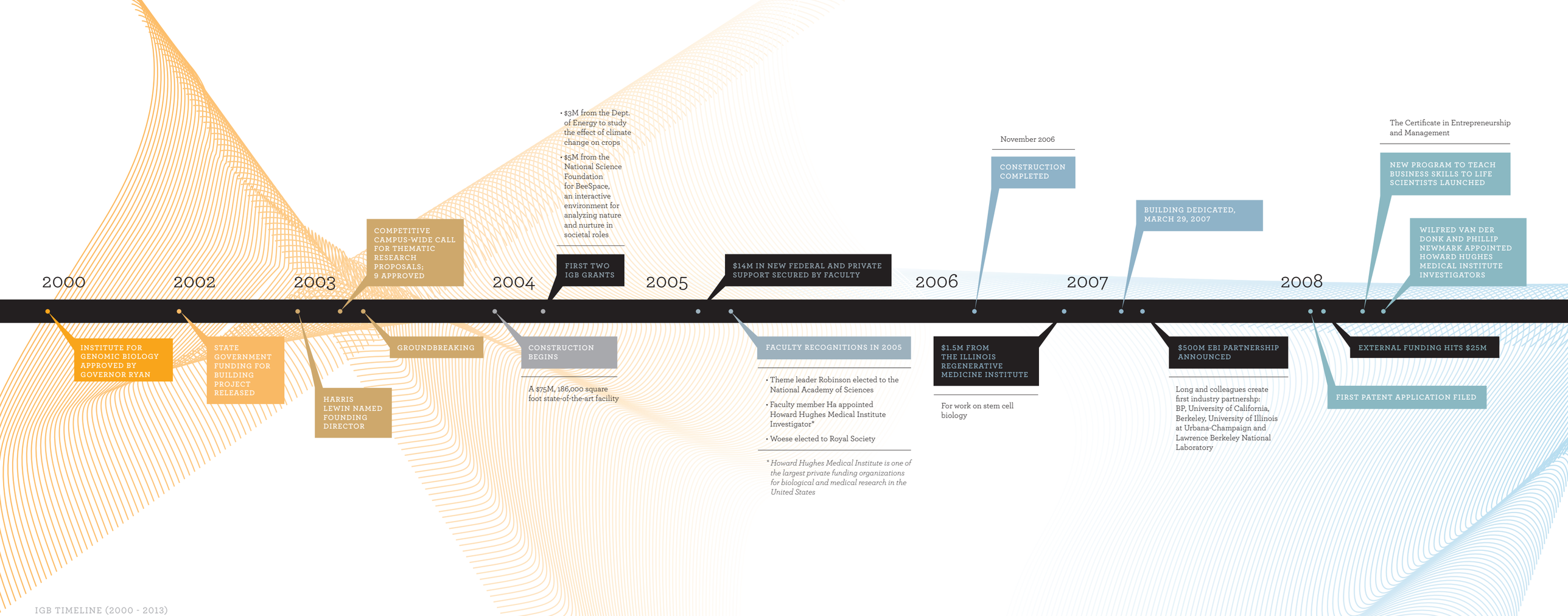
THE INSTITUTE FOR GENOMIC BIOLOGY

where science meets society





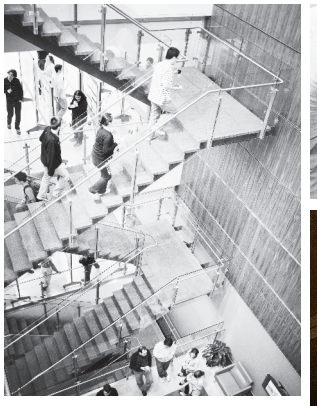
IGB TIMELINE (2000 - 2013)

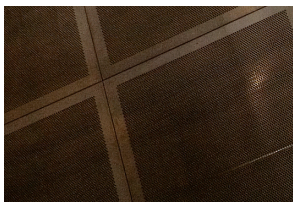
IGB Pioneers who have played a major role in the development of the IGB: Michael Aiken, Nancy Cantor, David Chicione, Robert Easter, Peter Fox, Richard Herman, John Katzenellenbogen, Harris Lewin, Charles Miller, Gerald Shea, Shankar Subramaniam, Carl Woese, Charles Zukoski

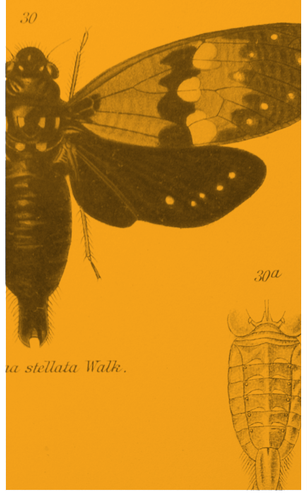
The University of Illinois' Institute for Genomic Biology is engaged in transformative research that is advancing life science research and stimulating bioeconomic development in the state of Illinois.

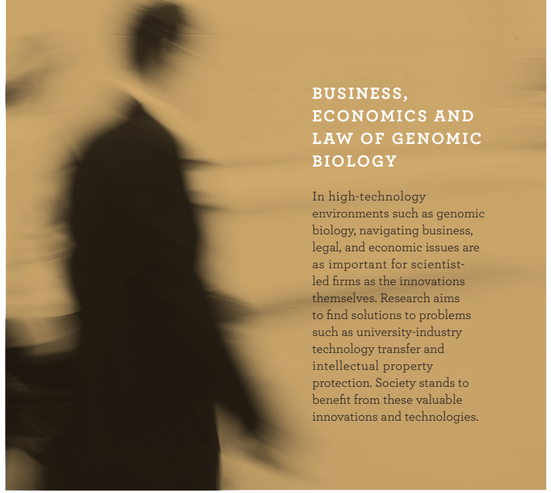
Since the Institute opened its doors in 2007, IGB researchers have developed a new antibiotic to combat food-borne diseases, a new yeast strain that will improve biofuels production, a technique to isolate tumor-seeding cancer cells and an algorithm to automatically integrate genomic and metabolic data.

This comprehensive research institute continues to push the frontiers of knowledge in the life sciences through research that is creative, collaborative, and focused on solving real-world problems in agriculture, human health, the environment, and energy use and production.







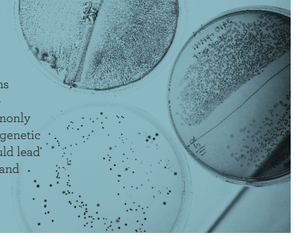


BUSINESS, ECONOMICS AND LAW OF GENOMIC BIOLOGY

In high-technology environments such as genomic biology, navigating business, legal, and economic issues are as important for scientist-led firms as the innovations themselves. Research aims to find solutions to problems such as university-industry technology transfer and intellectual property protection. Society stands to benefit from these valuable innovations and technologies.

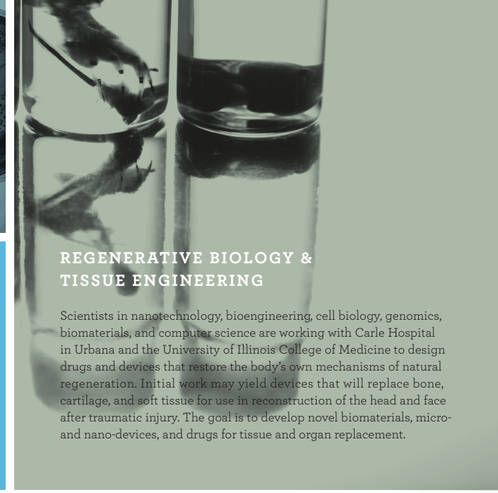
MINING MICROBIAL GENOMES

How will humanity deal with the pressing need for new drugs to treat pathogens that are resistant to antibiotics? Widespread overuse has led to a decline in the effectiveness of these drugs, and now many pathogens are resistant to all commonly used antibiotics. Scientists will search for these answers by unlocking the vast genetic potential of microbial genomes using sequence-based approaches. Success could lead to the discovery of novel classes of antibiotics, improved production methods, and better ways to examine antibiotic efficacy in human and animal hosts.



BIOSYSTEMS DESIGN

In order to produce better crops, new methods of drug production, novel medical treatments, and other biotechnological innovations, researchers focus on the development and application of synthetic biology tools for the design of improved or novel biological systems. Synthetic biology was launched with bacteria and yeast, but the ability to reprogram higher eukaryotes is limited. By addressing the most fundamental issues in eukaryotic synthetic biology, new methods are being created to tackle two grand challenges facing human society: health and sustainability.



REGENERATIVE BIOLOGY & TISSUE ENGINEERING

Scientists in nanotechnology, bioengineering, cell biology, genomics, biomaterials, and computer science are working with Carle Hospital in Urbana and the University of Illinois College of Medicine to design drugs and devices that restore the body's own mechanisms of natural regeneration. Initial work may yield devices that will replace bone, cartilage, and soft tissue for use in reconstruction of the head and face after traumatic injury. The goal is to develop novel biomaterials, micro- and nano-devices, and drugs for tissue and organ replacement.

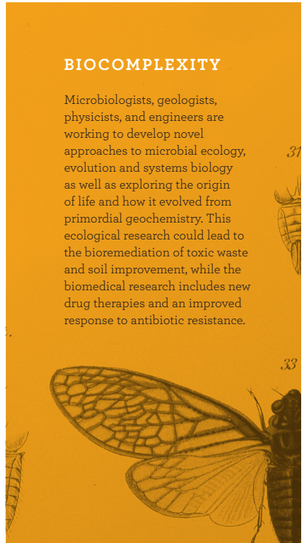
THE RESEARCH

The IGB—eight research themes and one externally funded research institute.

Faculty members from more than 30 departments across the University of Illinois conduct research into the pressing problems that confront society. While performing groundbreaking research, our faculty also understand the importance of engaging with the community and educating the next generation of scientists.

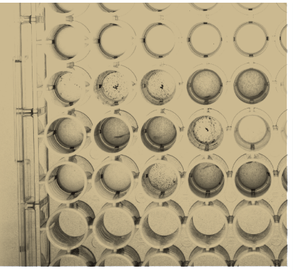
BIOCOMPLEXITY

Microbiologists, geologists, physicists, and engineers are working to develop novel approaches to microbial ecology, evolution and systems biology as well as exploring the origin of life and how it evolved from primordial geochemistry. This ecological research could lead to the bioremediation of toxic waste and soil improvement, while the biomedical research includes new drug therapies and an improved response to antibiotic resistance.



CELLULAR DECISION MAKING IN CANCER

If a cell is damaged, does it repair itself or decide to self-destruct? And how does the cell make that decision? Researchers are working with specialized tools to help unravel the complexities of individual cells and of larger systems. These experiments hold promise for personalized medicine and other healthcare advances.



GENOMIC ECOLOGY OF GLOBAL CHANGE

How will ecosystems—complex ecological communities and their environments—respond to rapid changes in climate? The University of Illinois at Urbana-Champaign has the only facility in the world for studying the effects of and rising levels of carbon dioxide and ozone on plants in open-air conditions. Research is focusing on the economic impact on agro-ecosystems, the development of products for agricultural pest and disease management, and a better understanding of the environmental implications of various energy supply options.

GENE NETWORKS IN NEURAL & DEVELOPMENTAL PLASTICITY

Together, researchers from neuroscience, developmental biology, evolutionary biology, mathematics, bioinformatics, and physics collaborate to uncover how the genomic mechanisms support phenotypic plasticity. They tackle questions such as how the genome responds to developmental signals and environmental stimuli, especially social stimuli, what mechanisms control and modulate those responses, and how those mechanisms are integrated into gene regulatory networks.

ENERGY BIOSCIENCES INSTITUTE

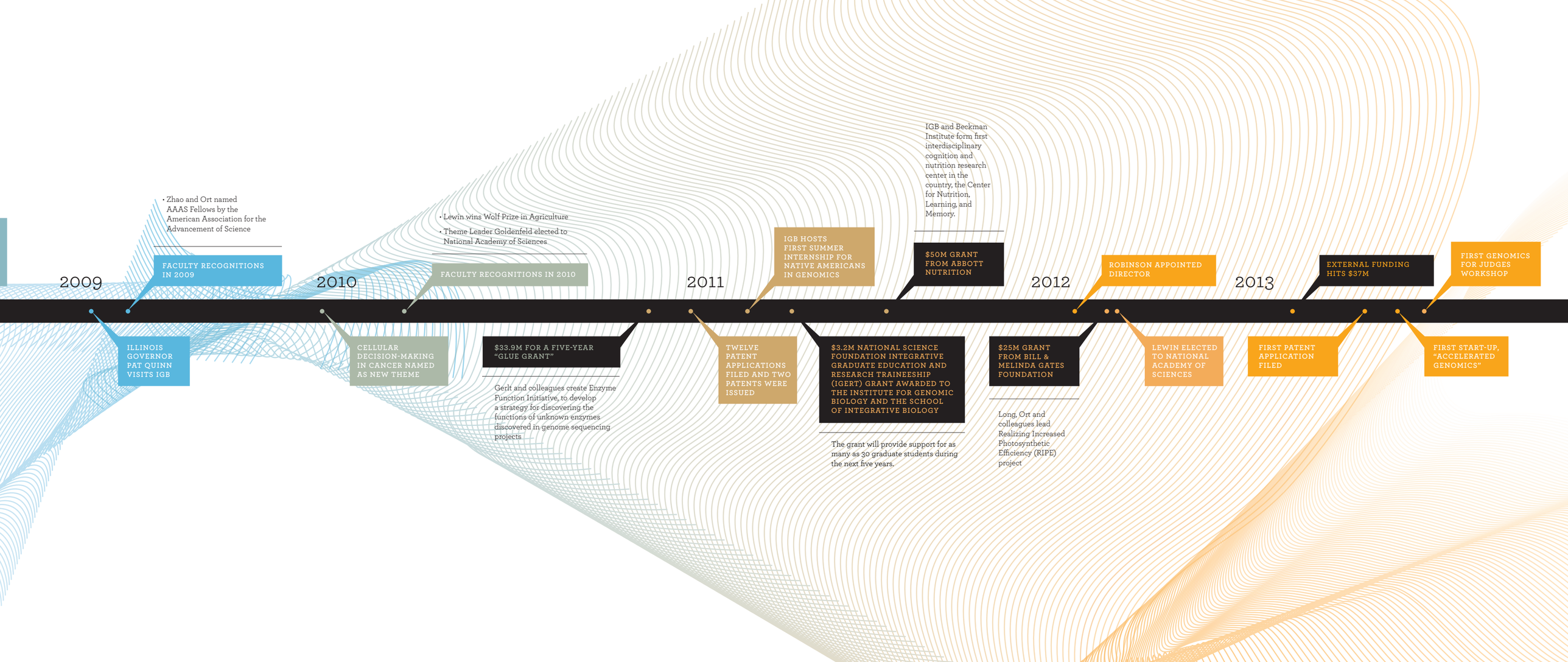
The Energy Biosciences Institute was created to address one of the 21st century's greatest challenges—finding a technological solution to the problems associated with climate change, global warming, and the rising price and diminishing supplies of carbon-based fossil fuels. Together with energy company BP, the University of California at Berkeley, the University of Illinois at Urbana-Champaign, and Lawrence Berkeley National Laboratory are embarking on a 10-year, $500 million quest to search for energy solutions that hope to benefit future generations.

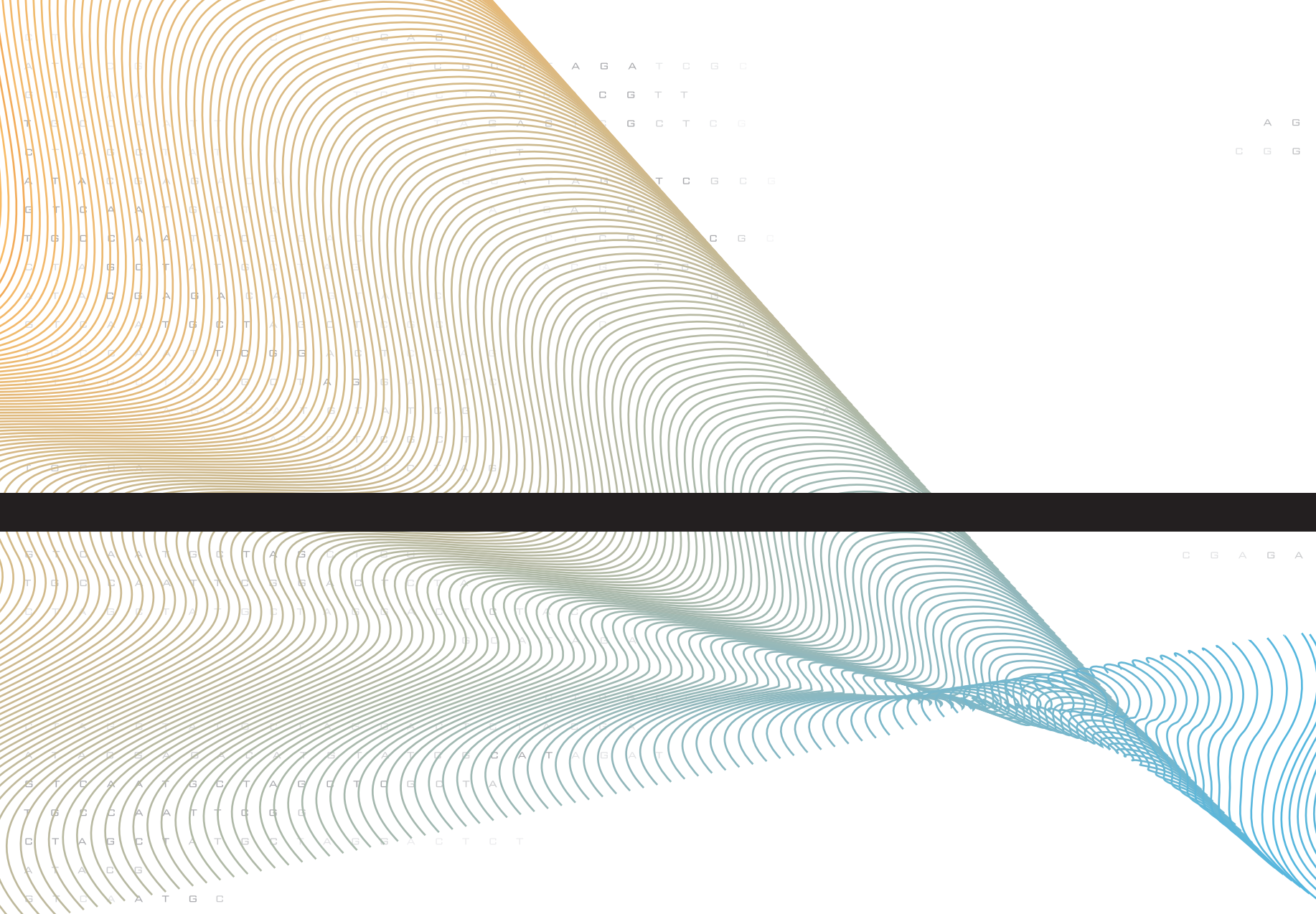
Established in 2003, construction of the $75 million, 186,000 square foot state-of-the-art Institute for Genomic Biology facility began in April 2004, and the building was dedicated in March 2007.

Seven open, spacious labs house facilities for biology, chemistry, bioengineering, and bioinformatics that accommodate research, interaction, and computation. And, a fully-equipped Core Facilities has cutting-edge instrumentation suites for microscopy and imaging, plant growth chambers, clean room for microfabrication, and bioanalytical equipment.

Realizing the full potential of the genomic revolution requires integrating approaches and results from different sub-disciplines of biology with technologies, approaches, and information from disciplines such as engineering, computer science, physics, chemistry, mathematics, and the geological and atmospheric sciences.

Together, scientists at the IGB are working to realize those goals and advancing the life sciences.


2009
• Zhao and Ort named AAAS Fellows by the American Association for the Advancement of Science
FACULTY RECOGNITIONS IN 2009
ILLINOIS GOVERNOR PAT QUINN VISITS IGB
2010
• Lewin wins Wolf Prize in Agriculture
• Theme Leader Goldenfeld elected to National Academy of Sciences
FACULTY RECOGNITIONS IN 2010
CELLULAR DECISION-MAKING IN CANCER NAMED AS NEW THEME
$33.9M FOR A FIVE-YEAR "GLUE GRANT"
Gerlt and colleagues create Enzyme Function Initiative, to develop a strategy for discovering the functions of unknown enzymes discovered in genome sequencing projects
2011
IGB HOSTS FIRST SUMMER INTERNSHIP FOR NATIVE AMERICANS IN GENOMICS
TWELVE PATENT APPLICATIONS FILED AND TWO PATENTS WERE ISSUED
IGB and Beckman Institute form first interdisciplinary cognition and nutrition research center in the country, the Center for Nutrition, Learning, and Memory.
$50M GRANT FROM ABBOTT NUTRITION
$3.2M NATIONAL SCIENCE FOUNDATION INTEGRATIVE GRADUATE EDUCATION AND RESEARCH TRAINEESHIP (IGERT) GRANT AWARDED TO THE INSTITUTE FOR GENOMIC BIOLOGY AND THE SCHOOL OF INTEGRATIVE BIOLOGY
The grant will provide support for as many as 30 graduate students during the next five years.
2012
ROBINSON APPOINTED DIRECTOR
$25M GRANT FROM BILL & MELINDA GATES FOUNDATION
Long, Ort and colleagues lead Realizing Increased Photosynthetic Efficiency (RIPE) project
LEWIN ELECTED TO NATIONAL ACADEMY OF SCIENCES
2013
EXTERNAL FUNDING HITS $37M
FIRST PATENT APPLICATION FILED
FIRST GENOMICS FOR JUDGES WORKSHOP
FIRST START-UP, "ACCELERATED GENOMICS"



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