



Pioneering Genomics  
to Positively Impact Life



# Genomic Pioneers

Dr. Venter realized early in his career that the rigidity and risk-adverse nature of traditional research organizations was not always conducive to scientific breakthroughs, so he decided to create one of his own. JCVI, founded in 1992 as The Institute for Genomics Research or TIGR, was a new kind of nonprofit research institute that gave scientists the freedom to pursue disruptive concepts and encouraged innovation to positively impact life.

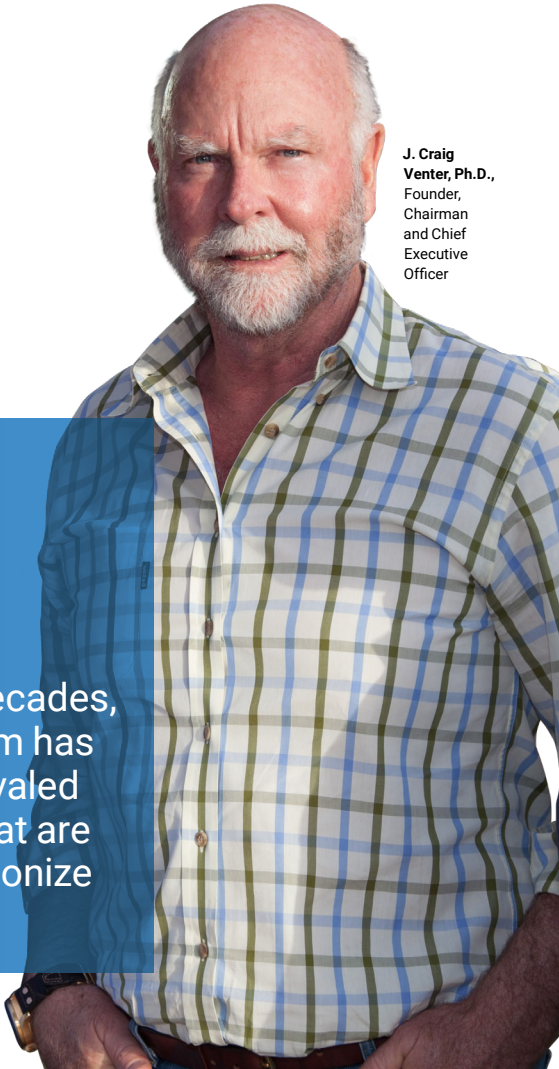


# JCVI

The J. Craig Venter Institute (JCVI) is a world leader in genomic research with 160 scientists and staff who are bold innovators fearlessly pursuing revolutionary ideas. With a long track-record of creativity and an interdisciplinary approach to genomics, JCVI is committed to accelerating foundational scientific research to drive advances in human health and environmental sustainability.

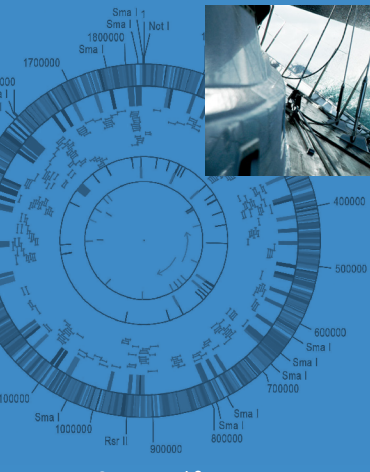


**J. Craig Venter, Ph.D.,**  
Founder,  
Chairman  
and Chief  
Executive  
Officer



For more than two decades, this scientific freedom has inspired a set of unrivaled accomplishments that are continuing to revolutionize genomic research.

# A History of Breakthroughs



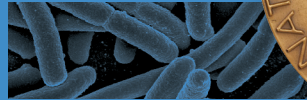
Sequenced first genome of a free-living organism, *H. influenzae*

1995



Discovered more than 80 million new genes and thousands of new species during the Sorcerer II Global Ocean Sampling Expedition

2003



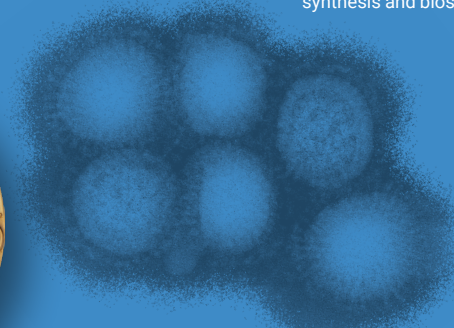
Conducted first metagenomic analysis of human gut microbiome

2006



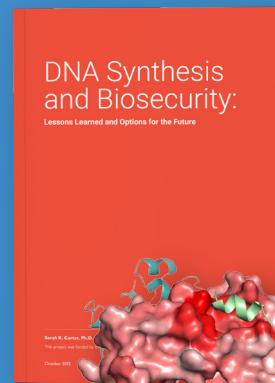
J. Craig Venter receives National Medal of Science from President Obama

2009



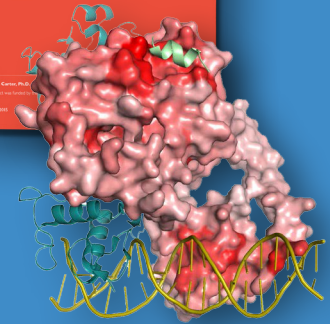
Sequenced over 17,000 influenza genomes and developed algorithm to predict optimal future flu vaccine composition

2013



JCVI-led policy group publishes report on DNA Synthesis and Biosecurity focusing on the lessons learned and options for the future in the field of DNA synthesis and biosecurity

2015



Created 1,000 3-D protein structures to be used for drug and vaccine research

2017

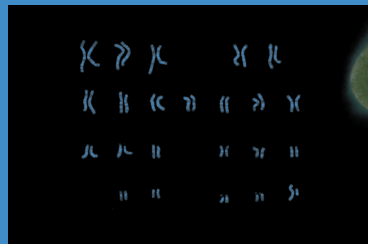
2001

Sequenced first draft human genome



2003

Published first complete human diploid genome, that of Dr. Venter, which encompasses both sets of chromosomes from each parent



Sequenced genome of *Neisseria meningitidis* and identified candidate genes for FDA-approved vaccine

2007

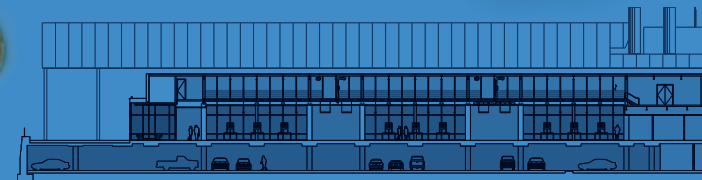
2010

Constructed first synthetic bacterial cell



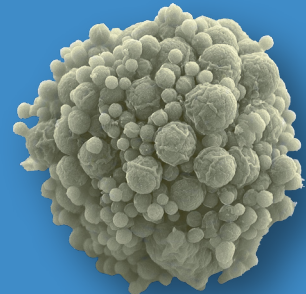
2013

Opened world's first net zero energy biological Laboratory in La Jolla, California



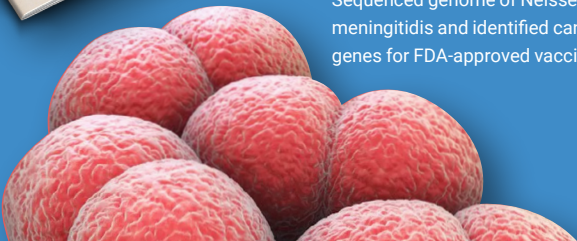
2016

Designed and constructed first synthetic minimal bacterial cell



## What's Next?

Today, our researchers are building upon a solid legacy of success as they continue to push the boundaries of genomics to improve our understanding of **human health and performance, environmental sustainability, the microbiome, synthetic biology, and infectious disease.**





## Fund the Future of Genomics



While JCVI scientists have long enjoyed a robust record of achievement in obtaining federal grants and contracts, the fact remains that the government tends to fund projects that are expounding on already proven science. Additionally, after submission of a grant proposal, it can take anywhere from 6–18 months for researchers to receive funding.

We believe accelerating the pace of discovery is the only way to make a significant and timely impact on the global challenges facing society. Visionaries like Dr. Venter, and the scientists at JCVI, focus on transformative research that challenges the status quo and proposes radical new ways of approaching fundamental science. Their tenacity continues to enhance our understanding of genomics and has contributed to some of the most significant scientific and medical discoveries of our lifetime.

JCVI depends on private funds to unleash our scientists' most groundbreaking ideas, moving them from mere plans to impactful programs. Imagine if you funded the quest to sequence the first human genome, supported the research that led to a meningitis vaccine, or enabled the construction of the first synthetic cell? That's the kind of work we do, and an investment in our innovative research allows you to change the world with us.

# Ways to Give

Fueling Discovery:  
Genomic Frontier Annual Fund

JCVI Innovative  
Research Programs

DiscoverGenomics!  
Science Education Program

JCVI Policy Center

Naming Opportunities

**JCVI** J. CRAIG VENTER  
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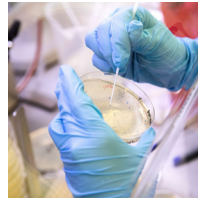
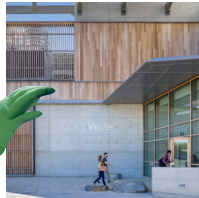
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## Fueling Discovery: JCVI Genomic Frontier Annual Fund

For the past 25 years, JCVI has provided some of the world's greatest scientists the freedom to test bold research and take risks without fear. This unique environment has fostered breakthroughs that are revolutionizing genomics, medicine and society.

The Genomic Frontier Fund is our new annual fund designed to provide unrestricted philanthropic support to our programs and operating expenses at JCVI. Your gift will be directed to areas of highest need, including the acceleration of our early stage research.



## Innovative Research Programs

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The biggest scientific breakthroughs developed at JCVI—including sequencing the first genome of a free-living organism, the first microbiome program, and constructing the first synthetic cell—were funded outside the traditional grant system.

A gift to one of our innovative research programs is an opportunity to support our scientists' most ambitious work. It allows JCVI scientists to dedicate more time to their research, and turn their ideas and expertise into action.



### Human Health

#### Center for Human Health and Performance

**Principal Investigators:** Pamila Brar, MD, Naisha Shah, Ph.D.  
and Ewen Kirkness, Ph.D.

A healthy, optimal life that enables individuals to achieve their personal potential is the goal for us all. Genetics, combined with different environmental interactions, makes every individual unique and the current one-size-fits-all medical solutions, inadequate. Building upon genomic expertise at JCVI, the Center for Human Performance aims to widen our understanding of how individualized markers affect human performance, traits and diseases. Utilizing advanced science and artificial intelligence approaches, we will identify key markers that enable optimal living, as well as risk factors for disease. It is our belief that this research will contribute to advancing the understanding of human health, and will enhance lives beyond managing health risks.

## Make Your Contribution Today

## Microbiome

### Inflammation: Friend or Foe

**Principal Investigator:** Marcelo Freire, DDS, Ph.D., DMSc

With a global rise in chronic inflammatory conditions, Dr. Freire's Laboratory seeks to understand the interactive biology between the immune system and the microbiome. This interaction elicits an inflammatory response that controls the incidence, severity and magnitude of diseases, such as periodontal disease and oral cancer, and could be implicated in common diseases such as Type 2 diabetes and lupus. To gain a deeper understanding this team is developing a wearable biosensor to monitor these relationships, giving real-time information on systemic health and aiding in the development of novel therapeutics that activate beneficial inflammatory pathways.

### Revolutionizing the Future of Dental Care

**Principal Investigator:** Chris Dupont, Ph.D.

Oral disease is a multibillion-dollar problem that greatly affects children worldwide. Current recommendations are two dental visits per year, yet oral diseases including cavities, progress more quickly. Dr. Dupont is leading research aimed at changing the landscape of dental care. He and his team are developing a test that performs microbial profiling on an individual's oral microbiome to determine if they are developing a cavity or other oral diseases. The goal of this program: an at-home sample kit that is noninvasive, widely accessible, and less than \$10, making it much more cost effective than a dental visit.

## Synthetic Biology

### No More Needles! Transforming the Treatment of Type 1 Diabetes

**Principal Investigators:** Yo Suzuki, Ph.D. and John Glass, Ph.D.

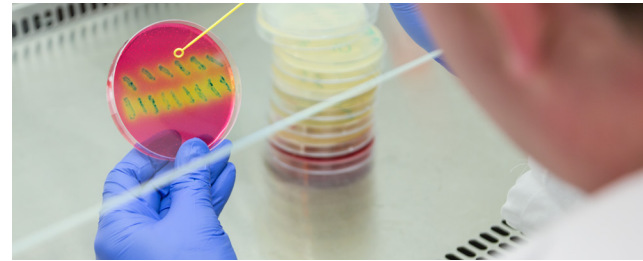
Dr. Suzuki and Dr. Glass have successfully repurposed skin bacteria to serve as surrogate beta cells that can sense blood glucose levels and secrete insulin in response to hyperglycemia. They are currently building upon this exciting breakthrough by testing whether these beta cells can produce enough insulin to control glucose uptake in the body. The team is working to refine a system that can be tested in actual T1D patients and will move us one step closer to a needleless alternative for T1D treatment.

## Infectious Disease

### Investigating Viral Disease to Develop Next Generation Vaccines and Therapeutics

**Principal Investigator:** Gene Tan, Ph.D.

Staying ahead of infectious diseases has proven to be a daunting task. Influenza viruses continue to evolve from season to season, causing annual epidemics that affect between 3 and 5 million people with severe respiratory disease and cause 500,000 deaths worldwide. In recent years, major outbreaks of viruses such as Zika and Ebola have had a devastating impact on different parts of the world. Traditional methodology has had success in the past, but with an ever-globalizing world, the need for fast, accurate and comprehensive research is paramount.



### Synthetic Engineering of Bacteria to Treat Drug Resistant Infections

**Principal Investigator:** Derrick E. Fouts, Ph.D.

Multidrug-resistant organisms (MDROs) are steadily increasing, and as a result are one of the greatest threats to global public health. Most people think of bacteria as the enemy, especially when it comes to fighting infectious disease, but Dr. Fouts and his team are exploring ways to harness bacteria and phages (viruses that only infect bacteria) as potential alternative antimicrobial strategies. They are working on designing phages that have an extended spectrum of infectivity by altering their genome sequence so they can recognize and kill more strains of MDROs and resist being destroyed by host defenses. These designer bacteriophages could also be employed as highly effective wound treatments when incorporated into topical creams or dressings. They could also lead to precise diagnostic tools with the ability to provide very sensitive and rapid identification of pathogenic bacteria.

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## Environmental Sustainability

### Eliminating Ocean Microplastics with Microbes

**Principal Investigator:** Chris Dupont, Ph.D.

Sadly, plastic is now the most prevalent type of marine debris found in the world's oceans. Plastic debris comes in all shapes and sizes, but those which are less than five millimeters are called "microplastics." Microbes are microscopic organisms, but constitute the largest biomass in the ocean. They colonize plastic once it enters the environment, creating a "plastisphere" that may contain pathways for toxin production and could be harboring fish or human pathogens. It is known that certain microbes can degrade different plastics using unknown pathways. JCVI scientists have been tackling this troubling area for several years. Dr. Dupont and his team are working to identify these microbes and better understand their mechanisms. Using sequencing and synthetic biology, they aim to engineer new microbes for safe plastic degradation and "upcycling" to decrease or even eliminate microplastics.



### Using Nature's Resources for More Sustainable Agriculture

**Principal Investigator:** Chris Dupont, Ph.D.

Nitrogen runoff from fertilizer use wreaks havoc on our ecosystem. Higher levels of nitrogen lead to the over-enriching of bodies of water with phosphates which can destroy native aquatic life and can cause the overgrowth of harmful algae that produce dangerous toxins. Previous research revealed that boreal forest systems get their nitrogen from symbiotic cyanobacteria, which fix atmospheric nitrogen and make it accessible for plants. JCVI scientists are examining the evolutionary history of this symbiosis using genomics, transcriptomics, proteomics, and NanoSIMS. Their goal is to reverse engineer this system in an effort to modify crop plants that can recruit cyanobacteria from the environment to replace harmful fertilizer and achieve more sustainable agriculture practices.



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# DiscoverGenomics!

## Science Education Program

The JCVI DiscoverGenomics! Science Education Program provides community resources for science education and professional development to students and teachers. We believe that some of the most valuable contributions our researchers can make happen outside of the lab, when we connect with our community to inspire and encourage exploration of the natural world.

Our mission is to:

**ENHANCE** scientific literacy | **DEVELOP** the next-generation  
**INCREASE** enthusiasm for science | of genomic scientists

## DiscoverGenomics! Mobile Lab

At JCVI, we believe every child deserves access to authentic, hands-on, inquiry-based science experiences. This is the philosophy driving our DiscoverGenomics! Mobile Laboratory Program. The mobile lab is a modified motor coach, outfitted with advanced laboratory equipment, electricity, running water and network capabilities that delivers science concepts and equipment directly to students.



To help expand our impact, we partner with The League of Extraordinary Scientists and Engineers (LXS), a San Diego nonprofit and growing community of scientists, entomologists, biologists, oceanographers, architects, engineers, educators, and parents. Together, we are working to bring collaborative learning opportunities to children at a young age, when they are most receptive. JCVI/LXS programs have **impacted over 35,000 students in 2019 alone**, and we have a lot of exciting events ahead of us.

## Internship Program

The JCVI Internship Program is a highly sought-after opportunity designed to develop and inspire the next generation of great scientists. Mainly offered between May and August, this program provides motivated high school, undergraduate and graduate level students with an in-depth research experience that includes:

- A dedicated mentor
- Collaboration with world-class scientists
- Hands-on participation in research projects tailored to their academic experience
- Access to state-of-the-art equipment and technology
- Workshops designed to help develop scientific and professional skills



## Training and Professional Development

JCVI's training philosophy revolves around a mix of not only lecture-based seminars, but also hands-on training in both the wet lab and in silico computational environments. Each training course and workshop is designed and scaled to engage the attendees at their own level, from high school students all the way to seasoned biomedical researchers and medical clinicians. Further, it is always a goal for the students to take home the ability to apply their lessons at their home facilities.

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## Community Outreach

We routinely open our doors for tours to local students, teachers, and organizations showcasing JCVI's current research projects in an operational laboratory setting. Our scientists also venture out in the community participating in local school STEM events, science fairs, and expos. Hands-on interactions demonstrate that science careers are diverse and attainable, igniting enthusiasm for science in our youth.



You can inspire a student's life-long interest, and maybe even career in science by supporting JCVI's DiscoverGenomics! Science Education Program.

## Learn More

To learn more about JCVI's science education program, contact:

**Stephanie Mounaud**

Education Program Manager

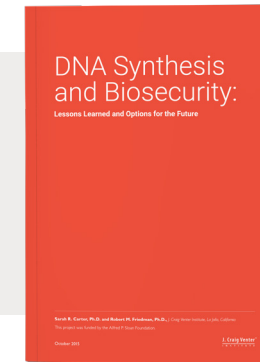
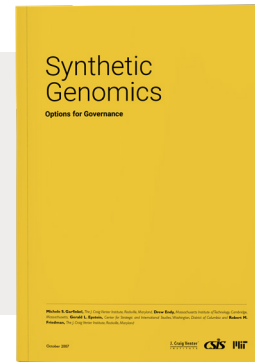
301-795-7557 | [smounaud@jcv.org](mailto:smounaud@jcv.org)

# JCVI Policy Center

**Principal Investigator:** Robert Friedman, Ph.D.

For over 15 years the JCVI Policy Center has worked hand-in-hand with our scientists as they continue to push the boundaries of 21st Century biology. As one of only a few embedded institutional policy groups in the world, we are in a unique position to better understand and anticipate the societal effects of these scientific breakthroughs.

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We remain committed to educating policy makers on the possible implications of emerging science so that they're able to create guidelines that will maximize the positive and avoid the negative outcomes on society. Your support will help JCVI remain a significant voice for responsible development of genomic science and technology.

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## Naming Opportunities

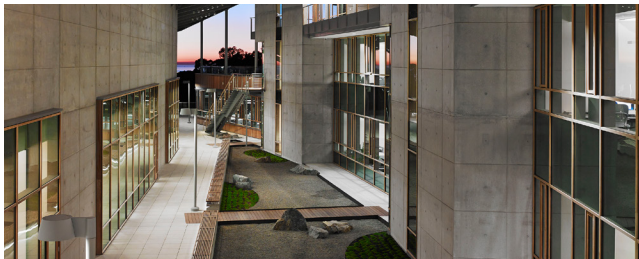
Science that is truly at the cutting edge requires state-of-the-art facilities and technology. Your named gift will allow our researchers to continue transcending scientific boundaries by providing new equipment, supporting a scientist, or expanding a lab.

**Research Laboratory Wing ..... \$15M**



The single-story, 12,605-square-foot laboratory wing is home to 125 scientists and is where JCVI's most meaningful work happens. It includes wet bench research and dry research workspaces. The labs use an innovative "plug-and-play" casework system that allows researchers to modify spaces to suit their needs.

**Courtyard ..... \$5M**



Located between the laboratory and office wings of the Institute, the central courtyard is the heart of JCVI. The green space serves as both an informal gathering place for staff and as a setting for receptions and other special events. Photovoltaic arrays, which also generate power for the building, provide shade over the space.

**J. Craig Venter Institute Archives ..... \$8M**



Located on the second floor, the archives were formed in late 2005 to preserve and provide access to the JCVI History of Molecular Biology Collection – a comprehensive array of original, rare, and unique primary source materials marking significant milestones in the history of molecular biology. The collection includes galley proofs, correspondence, photographs, offprints, edited and unpublished manuscripts, and laboratory notebooks from Nobel Laureates and renowned scientists such as Sydney Brenner, Francis Crick, Max Delbrück, Rosalind Franklin, Aaron Klug, Linus Pauling, Max Perutz, Maurice Wilkins, and James Watson.

**Chairman's Terrace ..... \$2M**



The chairman's suite is situated on the second floor, overlooking the terrace and garden and with inspiring ocean views. The space serves as the workspace for J. Craig Venter and is also used as a meeting room.

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**Lobby** .....\$1.5M



Guests are welcomed to the lobby with bamboo flooring and cedar wood-framed windows opening to JCVI's central courtyard. The lobby is the main entrance to the administrative office and research laboratory wings.

**Auditorium** .....\$1M



Located on the third floor, JCVI's auditorium seats more than 100 guests and is used for seminars, specialized workshops, and conferences throughout the year.

**Named Faculty Chairs**.....<sup>STARTING AT</sup> \$1M



Funding for named faculty chairs enables JCVI to attract top researchers or support current senior level faculty and distinguished professors. Donations for Named Chairs can be made with outright gifts and can also be established through multi-year pledge payments or through gifts made through a will or other planned giving vehicles.

# JCVI

Join us and help accelerate  
the pace of discovery

# JCVI

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