

Catalyst for a Cure: A Model for Collaborative Research



The Catalyst for a Cure Research Model

Glaucoma Research Foundation (GRF) pioneered collaborative scientific discovery more than 20 years ago with the first Catalyst For A Cure initiative. The inaugural consortium **redefined** glaucoma as an age-related neurodegenerative disorder of the central nervous system.

Over the years, the Catalyst for a Cure initiatives have consistently shaped the way we study, define, and treat glaucoma. By fostering collaborative research and uniting investigators from different disciplines to work together, GRF presented a progressive and highly effective new research model.



Collaboration from the beginning



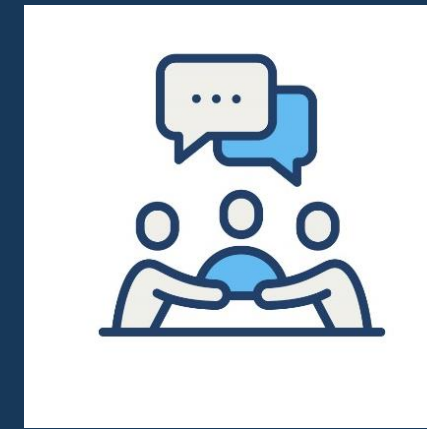
Three glaucoma specialists collaborate with philanthropic patients to establish Glaucoma Research Foundation in 1978



Four Catalyst for a Cure teams funded to date with plans for additional consortiums



Collaborative Normal Tension Glaucoma Study, fully funded by GRF documents that lowering eye pressure preserves vision



Launch of **Glaucoma 360** to enhance collaboration from discovery through translation to clinical care



Partnership with another foundation to launch the first Catalyst for a Cure with four scientists



Collaboration and philanthropic investment lead to new **Treatment Accelerator** to speed commercialization of neuroprotective therapies

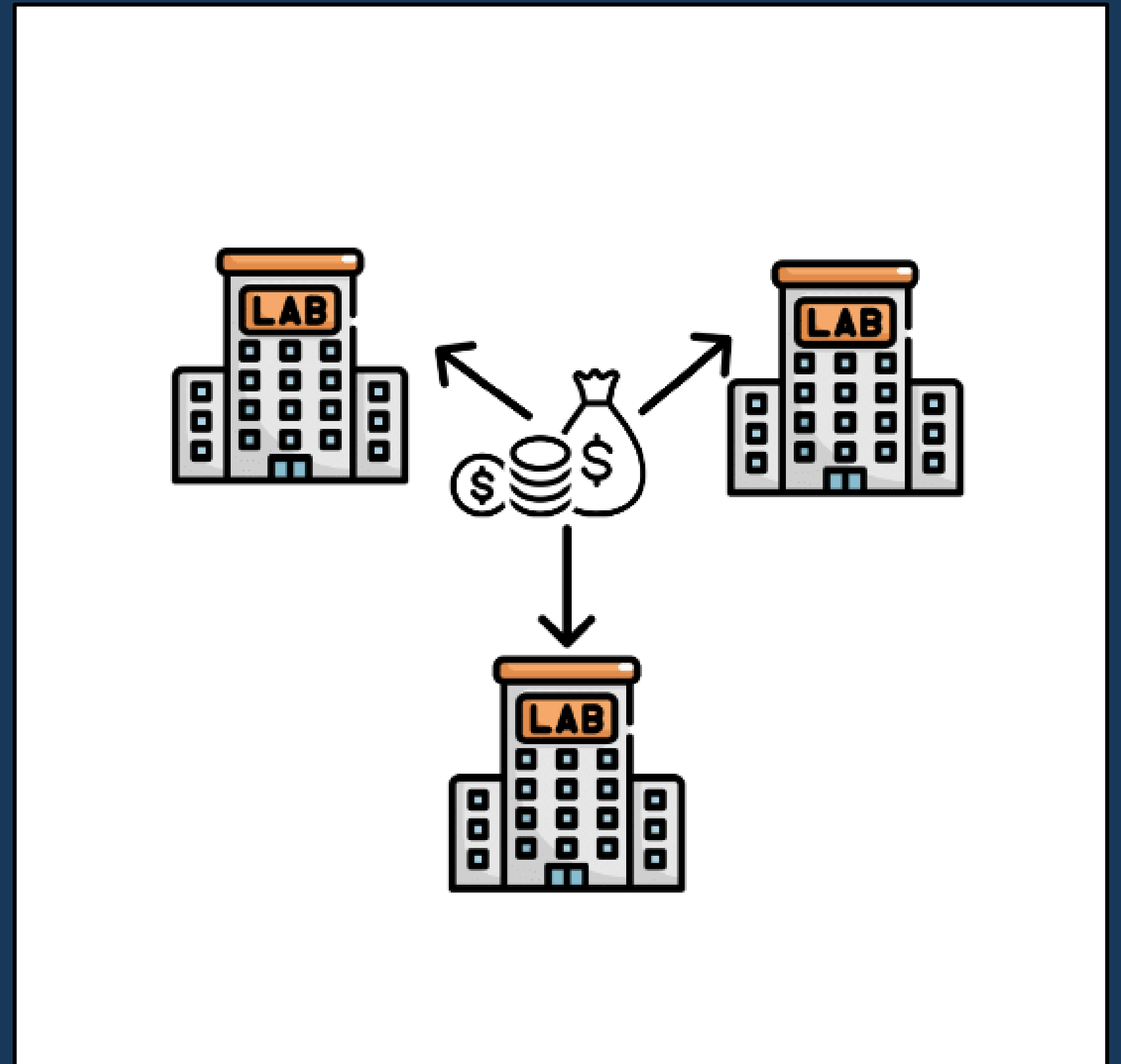
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Traditional Research Models

Research laboratories in the United States compete as individuals to garner grants.

Since academic promotion depends on success in this arena, there is very little incentive to collaborate.

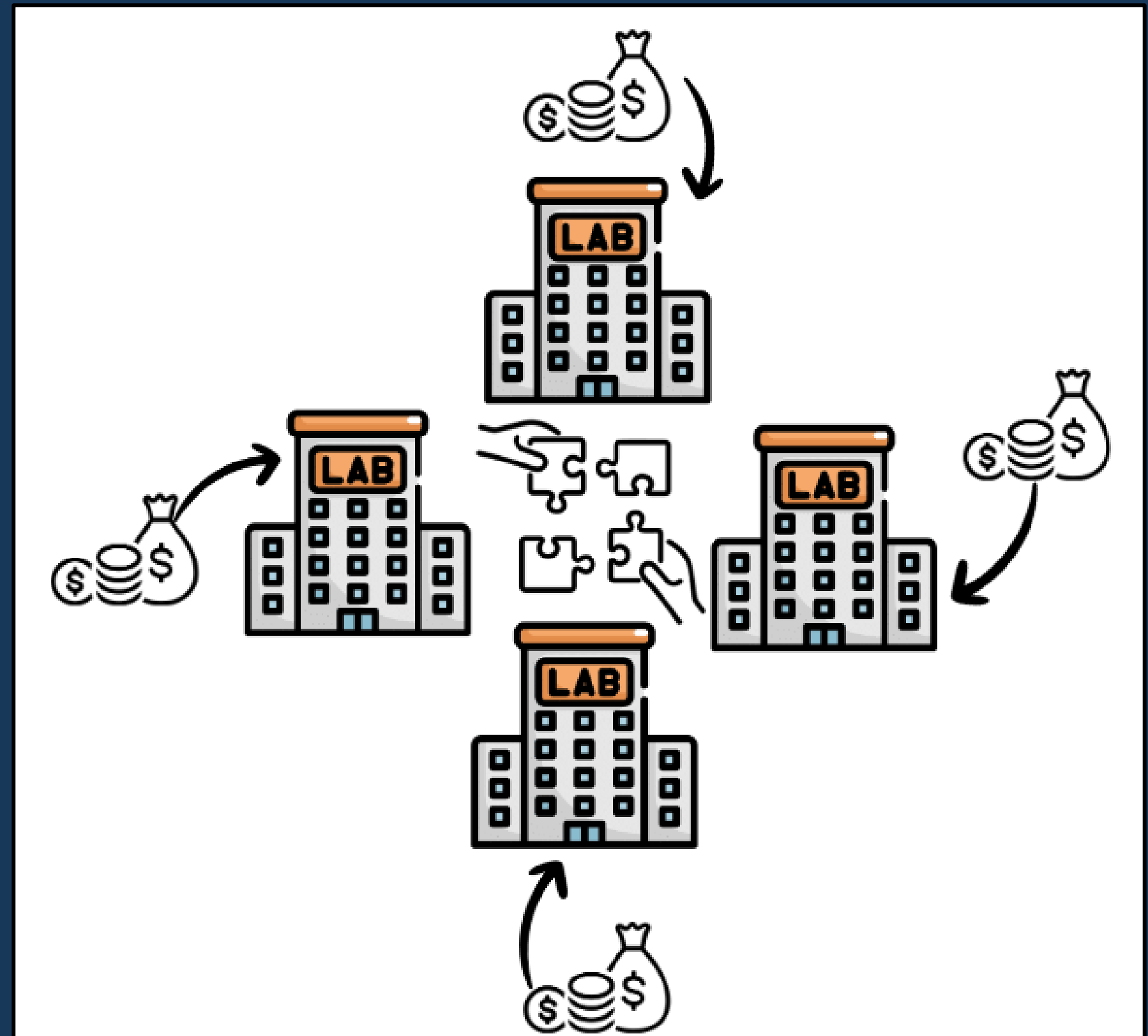
This process is also biased toward established, senior scientists who tend to avoid risks to maintain funding.



Why our collaborative research model works

Our model works because we recruit talented and skilled researchers from different disciplines at leading research facilities.

Since the investigators are early in their careers, they are flexible in their approach and our multi-year funding allows them to undertake self-directed and high-risk/high-reward investigations. They spend more time on research and less time on competing for grant funding.



THE LAUNCH OF THE CATALYST FOR A CURE



In 2002, the Glaucoma Research Foundation launched the **Catalyst for a Cure**, a unique model of collaborative research bringing together four scientists at different institutions with complementary skills to solve glaucoma

Critical Elements:

- True collaboration is essential
- Multidisciplinary teams spark more ideas
- Significant results require sustained effort



Catalyst for a Cure Research Model in Brief

The principal investigators:

- Each CFC research team to date has consisted of four scientists
- They are from different laboratories and represent different disciplines
- They are early in their careers but have promising training and demonstrated expertise
- They are willing to commit themselves and their laboratories to a collaborative structure

The Scientific Advisory Board:

- Each CFC research initiative (four have been launched to date) has had its own SAB
- SAB numbers have been variously set from four to seven advisors
- The advisors are eminently qualified and highly regarded senior research scientists
- They can imagine the success that might result from this non-traditional approach



The Catalyst for a Cure – In Brief

- Initial term – set at 3 years, each year's funds dependent on required reports and approvals
- Launch – PIs and advisors meet, set preliminary objectives, agree on year-one agenda
- During term – PIs communicate often, work together, report to SAB at required intervals
- During term – SAB members are available to PIs, meet with PIs no less than annually • Annually and at term's end – SAB reports to sponsors, may recommend continued funding

**LAUNCH CATALYST
FOR A CURE
2002**



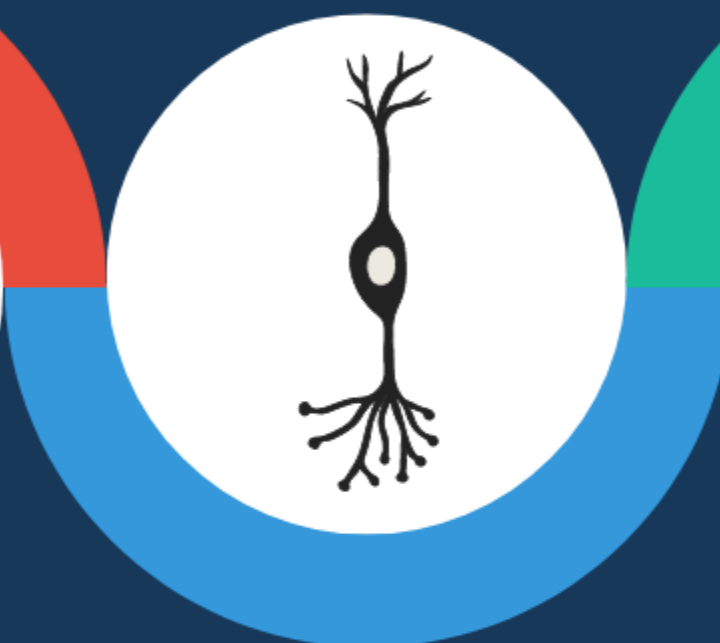
**CFC 1:
NEUROPROTECTIVE INITIATIVE
2002-2012**



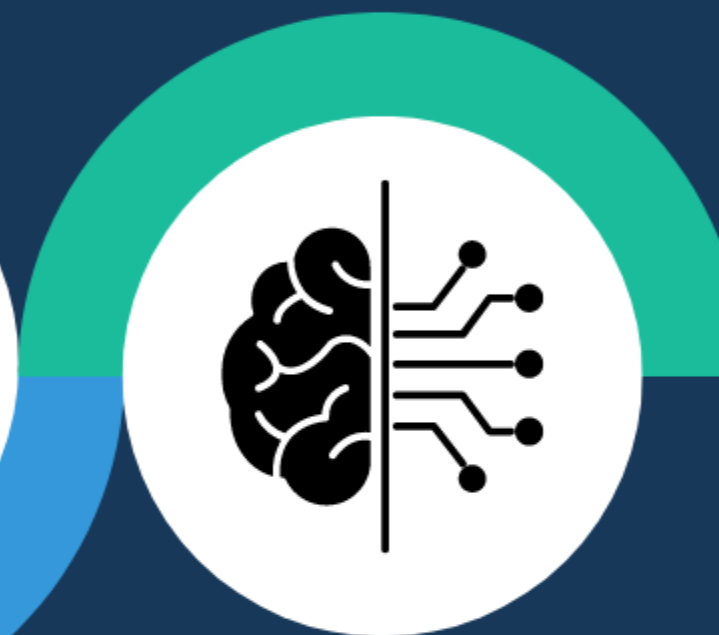
**CFC 2:
BIOMARKER INITIATIVE
2012-2018**



**CFC 3: VISION
RESTORATION INITIATIVE
2019 - Present**



**CFC 4: PREVENT AND CURE
NEURODEGENERATION
2022 - Present**



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2002 - 2012

CFC 1: NEUROPROTECTIVE INITIATIVE



- To ensure a fresh perspective, the Principal Investigators were not previously studying glaucoma
- The team's findings redefined our understanding of glaucoma



David J. Calkins, PhD
Vanderbilt Eye Institute



Phillip J. Horner, PhD
Houston Methodist



Nicholas Marsh-Armstrong, PhD
University of California, Davis



Monica L. Vetter, PhD
University of Utah

CFC 2: BIOMARKER INITIATIVE

2012 - 2018

- Identified biomarkers that signal early changes that lead to vision loss: RGCs change shape much earlier in the disease
- Concentrated on 3 biomarkers which are now being used in clinical trials to protect vision



Alfred Dubra, PhD
Stanford University



Jeffrey L. Goldberg, MD, PhD
Stanford University

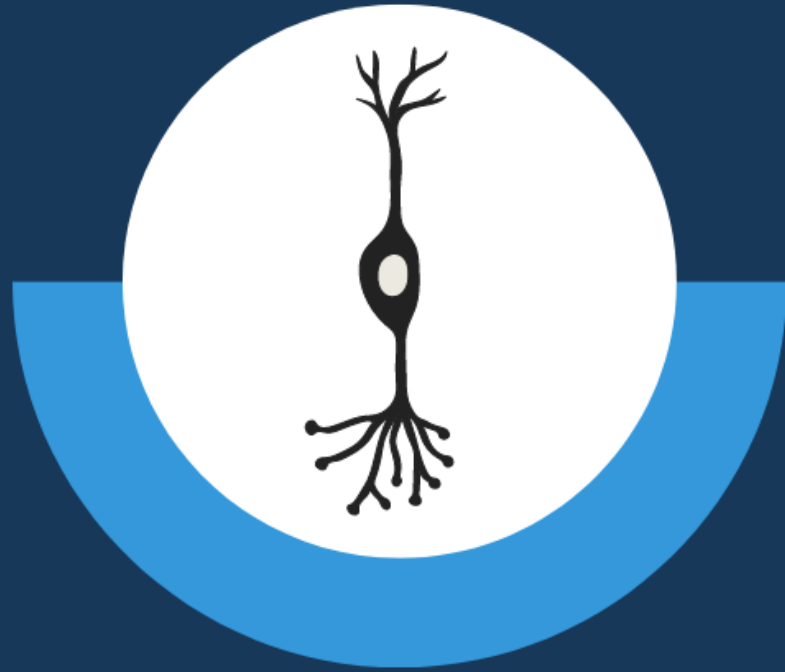


Andrew D. Huberman, PhD
Stanford University



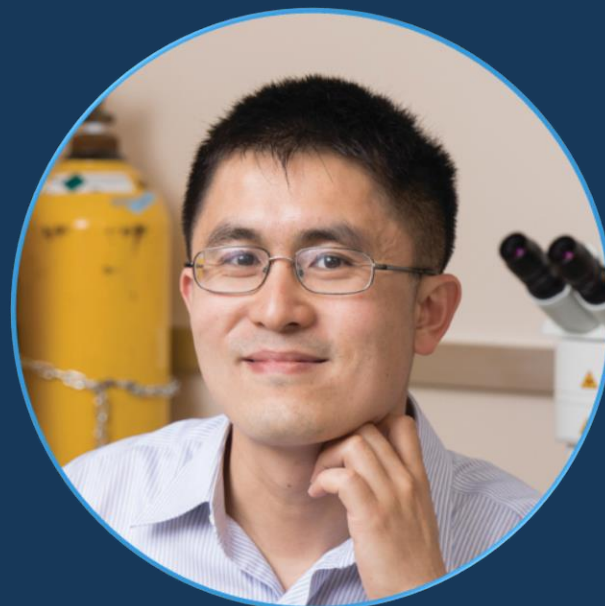
Vivek Srinivasan, PhD
New York University Langone

2019 – Present



CFC 3: VISION RESTORATION INITIATIVE

- Experts in neuroprotection, physiology, cell biology and ophthalmology



Xin Duan, PhD
University of California,
San Francisco



Yang Hu, MD, PhD
Stanford University

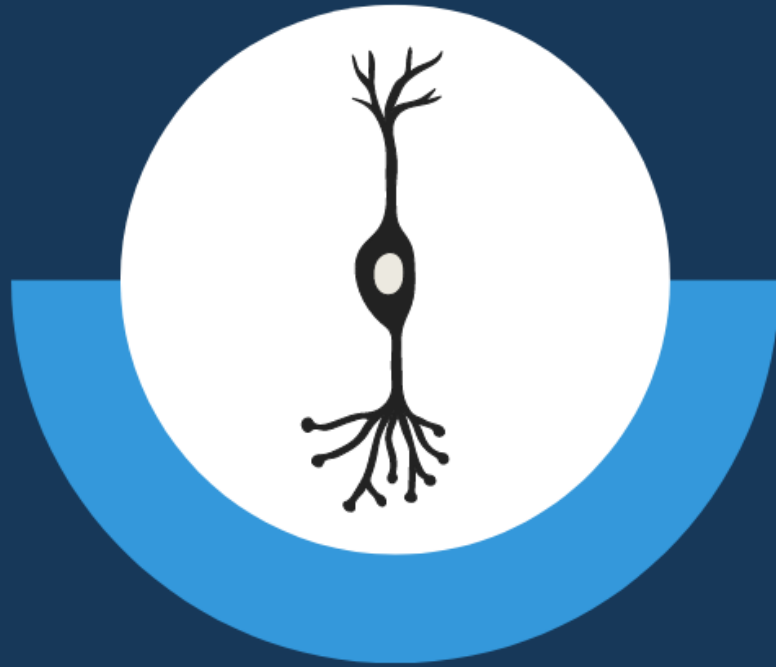


Anna La Torre, PhD
University of California,
Davis



Derek Welsbie, MD, PhD
University of California,
San Diego

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CFC 3:
VISION RESTORATION INITIATIVE
Scientific Advisory Board



Jeffrey L. Goldberg, MD, PhD
SAB Chair
Stanford University



Valeria Canto-Soler, PhD
University of Colorado School of
Medicine

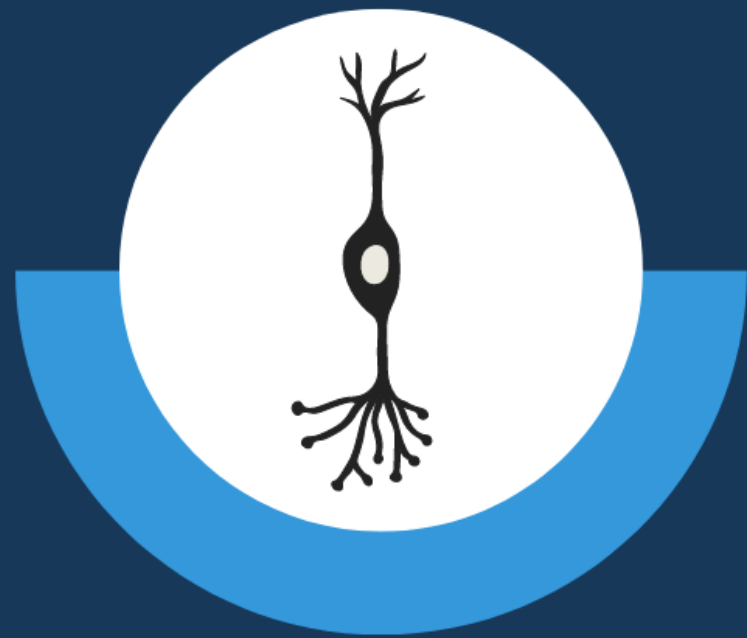


Larry Benowitz, PhD
Harvard Medical School
Boston Children's Hospital



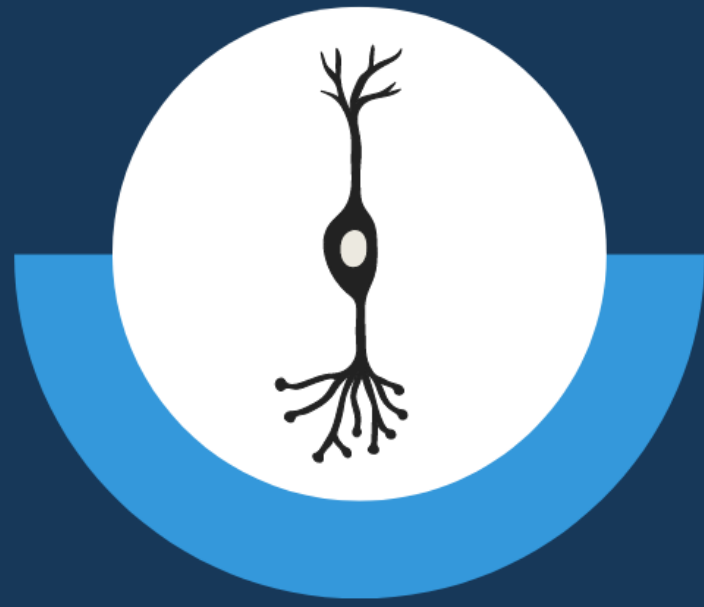
Zhigang He, PhD, BM
Harvard Medical School
Boston Children's Hospital

2019 – Present



CFC 3: VISION RESTORATION INITIATIVE

- Restoring vision by transplanting retinal ganglion cells
- Identified 3 genes that need to be “turned off” to improve the survival of retinal ganglion cells
- Identified protective genes that need to be “turned on” to promote the survival of injured RGCs and enable these cells to regenerate damaged nerve fibers (axons) and connect to the brain



CFC 3: VISION RESTORATION INITIATIVE

- Developed an imaging technique to test whether the transplanted cells are making useful connections with the rest of the retina
- Discovered a protein, osteopontin, protects optic nerve cells and might be a potential biomarker of glaucoma
- With these new developments, the team will spend this next year improving optic nerve cell transplantation

2022 – Present

CFC 4:

**The Melza M. and Frank Theodore Barr Foundation
Catalyst for a Cure Initiative to Prevent and Cure
Neurodegeneration**

- Experts in brain vascular biology, glaucoma, computational biology and neuroscience



Sandro Da Mesquita, PhD
Mayo Clinic



Milica Margeta, MD, PhD
Harvard Medical School



Karthik Shekar, PhD
University of California,
Berkeley



Humsa Venkatesh, PhD
Harvard Medical School

GLAUCOMA RESEARCH FOUNDATION



CFC 4:
The Melza M. and Frank Theodore Barr Foundation
Catalyst for a Cure Initiative to Prevent and Cure
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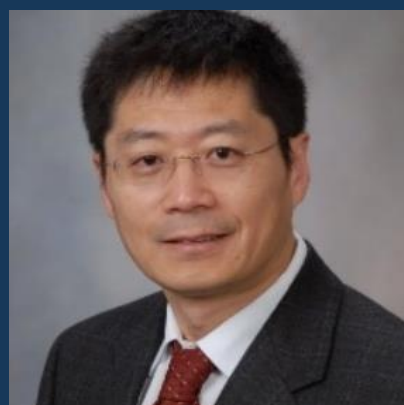
Adriana Di Polo, PhD
SAB Chair
University of Montreal



Shane Liddelow, PhD
New York University



Monica Vetter, PhD
Department of
Neurobiology &
Anatomy, University of
Utah School of Medicine



Guojun Bu, PhD
The Hong Kong University
of Science and Technology



Sally Temple, PhD
New York Neural Stem
Cell Institute University
at Albany, New York

2022 – Present



CFC 4: PREVENT AND CURE NEURODEGENERATION

- Exploring commonalities in some neurodegenerative diseases (Glaucoma, Alzheimer's disease and Gliomas) in search of potential preventative measures and cures
- These diseases affect different subpopulations of neurons but share several common microenvironmental markers that cause neurons to degenerate and die
- Focused on optimizing the key genomic profiling technique, “single cell RNA Sequencing” (scRNAseq), that will be used to analyze the microenvironment in the different diseases

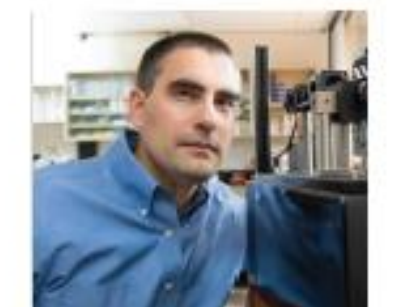
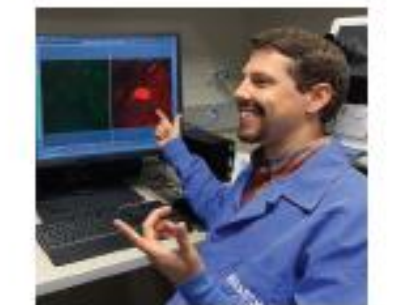
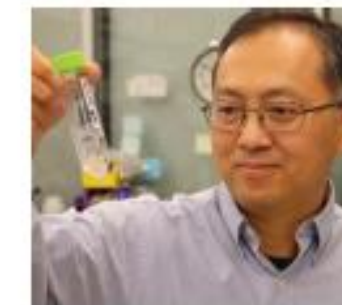


ADDITIONAL COLLABORATION BETWEEN TEAMS

- Collaboration between the Shekhar lab (UC Berkeley) and Xin Duan (UCSF)
- Development and validation of a technique called “spatial transcriptomics”: enables detection of changes in many genes in thin sections of the retina (normal and glaucoma models)
- They will use this technique to detect changes in the microenvironment
- This information will lead to development of novel therapeutic approaches

CATALYST FOR A CURE REPORT
TWENTY YEARS OF INNOVATION
2002 TO 2022

A GUIDE FOR COLLABORATIVE RESEARCH



Download our Guide for
Collaborative Research at
<https://qrco.de/bfpbrw>
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