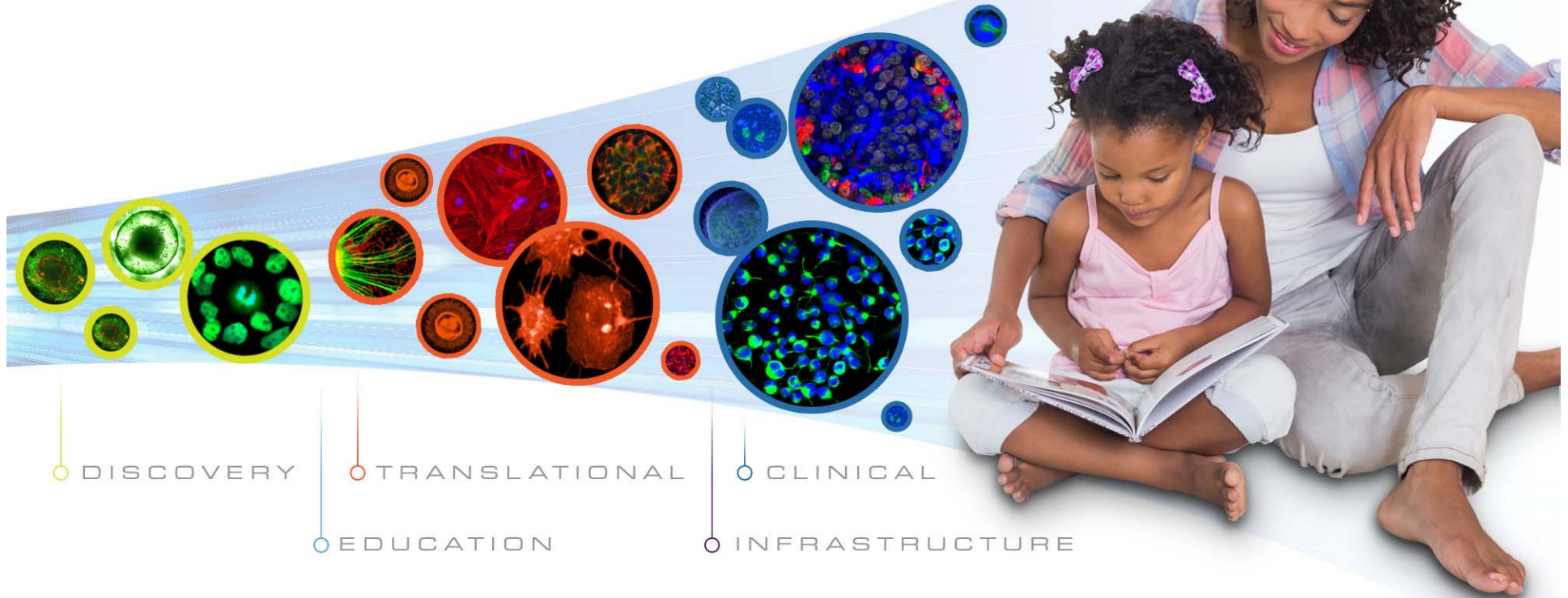


June 2016

# CIRM

CALIFORNIA'S STEM CELL AGENCY



## Education Critical to Stem Cell Therapy Pipeline

**Don L. Gibbons**

Senior Science and Education  
Communication Officer

# California Institute for Regenerative Medicine (CIRM)



DISCOVERY  
TRANSLATIONAL  
CLINICAL  
EDUCATION  
INFRASTRUCTURE

- CIRM is California's Stem Cell Agency
- Created in 2004 through Proposition 71
- Prop 71 amended the California Constitution
- \$3 billion in funding for stem cell R&D
- Includes Education, Infrastructure, Discovery, Translational and Clinical Research

## Our Mission

Accelerating stem cell treatments to patients with unmet medical needs.



# CIRM funds the continuum the field needs



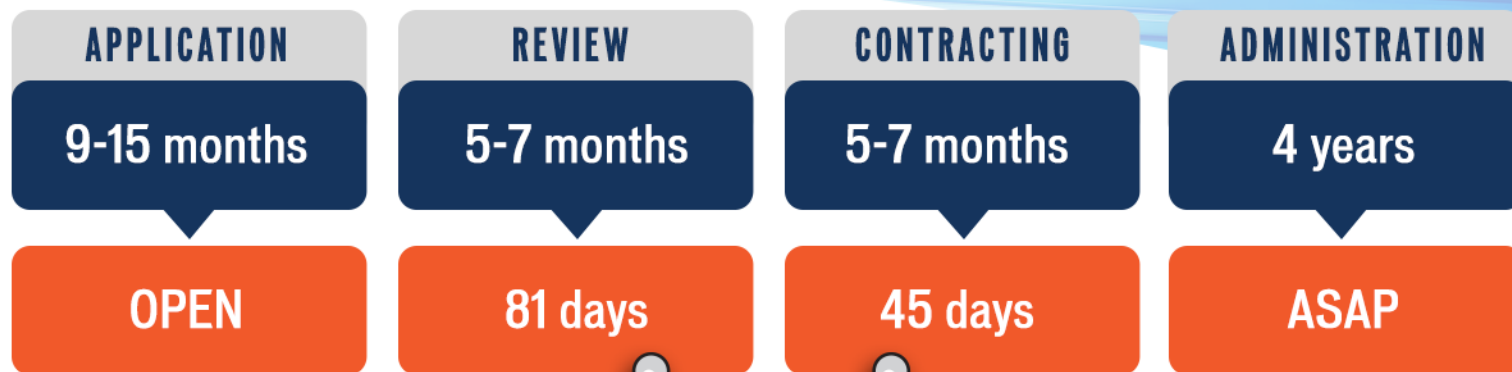
# What is CIRM 2.0



DISCOVERY  
TRANSLATIONAL  
CLINICAL  
EDUCATION  
INFRASTRUCTURE

- A radical overhaul of the way the Institute does business
- Introduces faster, more efficient systems
- Places added emphasis on:
  - ✓ Speed
  - ✓ Partnerships
  - ✓ Patients

# The Result is a Better, Faster Product



# CIRM's Product So far

- 650+ projects funded (300+ still active)
- Nearly 2,000 scientific publications
- 16 funded clinical trials
- 9 clinical trials built on earlier CIRM funding
- 40,000+ job years of employment
- Half a billion in follow-on funding
- 23 companies created
- Some 150 research tools created

# Our Education Product

- Five unit curriculum used in high school & Community Colleges
- Paid summer lab internships for high school students
- Bridges to Stem Cell Science for undergrad and masters students (900+)
- Shared lab training courses
- CIRM scholars, post docs, clinical fellows and grad students (900+)
- Junior faculty “New Faculty Awards” (63, ave \$2.8M)



## EDUCATION CURRICULUM

### • NGSS-CIRM Curriculum

#### [Beginner Unit Overview](#)

##### [Lesson 1](#)

##### [Lesson 2](#)

##### [Lesson 3](#)

##### [Lesson 4](#)

#### [Advanced Unit Overview](#)

##### [Lesson 1](#)

##### [Lesson 2](#)

##### [Lesson 3](#)

##### [Lesson 4](#)

##### [Lesson 5](#)

### • Stem Cell Education Portal

#### [Curriculum Units Overview](#)

##### [Unit 1](#)

##### [Unit 2](#)

##### [Unit 3](#)

##### [Unit 4](#)

##### [Unit 5](#)

[Home](#) / [Our Progress](#) / [Stem Cell Education Portal](#)

[SHARE](#)[PRINT](#)

## CIRM-NGSS Stem Cell Curriculum

In September 2013, the State of California adopted the [Next Generation Science Standards \(NGSS\)](#), a national effort to transform K-12 science into an interdisciplinary, practical, real-world endeavor accessible to all students. The California Institute for Regenerative Medicine has created the first NGSS-based high school units that teach fundamental cell biology, organismal biology, and genetics concepts through the lens of stem cell research.

- [Visit the CIRM-NGSS Stem Cell Curriculum](#)



## Stem Cell Education Portal

Welcome to the California Institute for Regenerative Medicine's education portal, where you can download CIRM's stem cell education modules and learn more about stem cell research. This curriculum is referred to in Senate Bill 471 (Romero, Steinberg and Torlakson), the [California Stem Cell and Biotechnology Education and Workforce Development Act of 2009](#), which was signed by Governor Schwarzenegger in 2009.

# Five multi-media units

- Unit 1: Embryonic stem cells, in-vitro fertilization and pre-implantation genetic diagnosis
- Unit 2: Adult stem cells, homeostasis and regenerative medicine
- Unit 3: The microenvironment, its role in cell fate decisions and cancer
- Unit 4: The immune system and the hematopoietic stem cell lineage tree
- Unit 5: Developing induced pluripotent stem cells

# Bridges to Stem Cell Research

- 11 programs approved Jan 2009 for 3 years
- 5 more approved Dec 2009
- 3-year extension in 2011
- One-year extension in 2014
- \$60 million committed
- 14 approved for CIRM 2.0 version Jan 1016
- \$40 million committed over 5 years

## Letter from state senate leader

“An educated and properly trained workforce is essential if our state is to retain its premier position and fully realize the medical and economic benefits from this emerging industry”



# Key activities

- Stem cell techniques course
- Institution-specific added course work
- Auxiliary training such as in IP and career opportunities
- Paid internships in major stem cell labs (8-12 months)
  - Stipend up to \$2,500/mo
- Many collaborations with other colleges, universities, companies
- Annual meeting with all interns giving poster presentations



[Bridges program video 2011](#)

# Bridges outcomes

- Diversity reflects California
  - i.e. one typical program: 76% minority, 45% low income, 47% 1<sup>st</sup> generation
- Over 900 trained
- 50 % employed in academic and industry labs
  - >20 universities, >50 biotech/pharma co's
- 30 % further graduate or professional training
- 20 % completing original degree

## 2.0 changes

- Direct patient engagement activities
- Community outreach activities engaging diverse communities in supporting health initiative
- Formal training on the regulatory pathway and development processes
- Dynamic academic and career counseling including alumni



## Bridges to Stem Cell Science 2.0

“The first part of the Prop 71 money pretty much all went into basic research. Scientists just wanted to find out why things worked or how things worked.

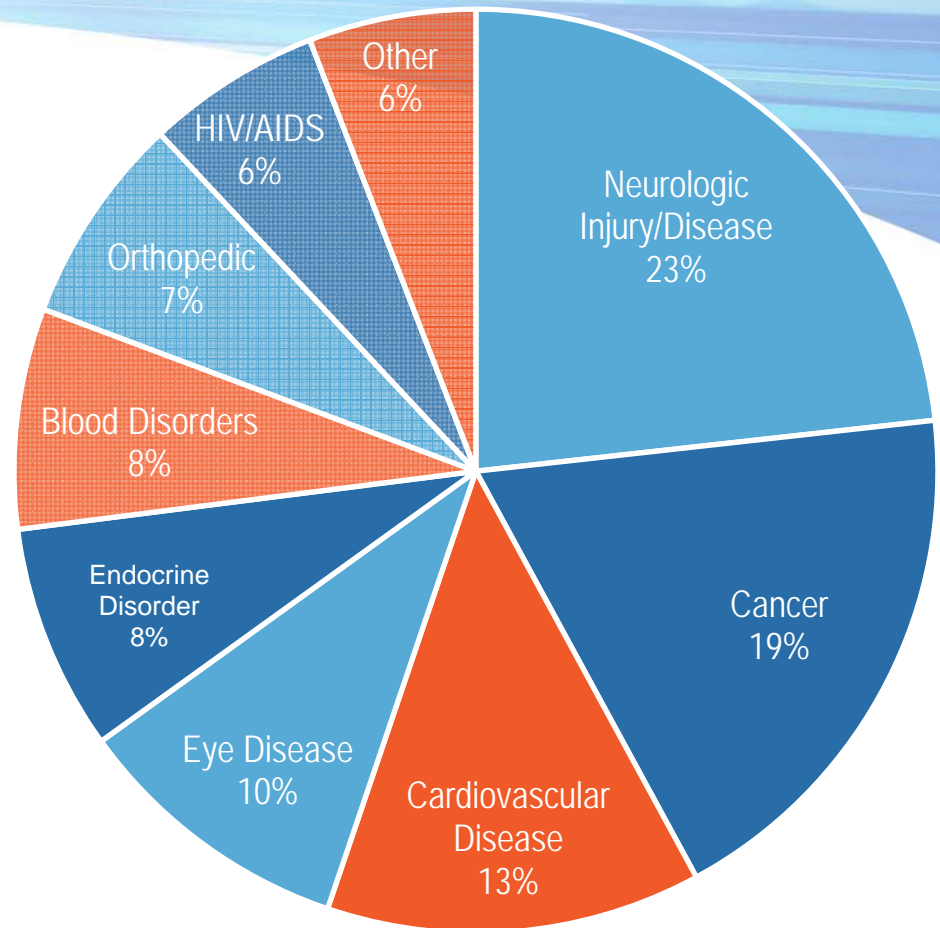
“Now we’re moving into what we call ‘translational,’ which is the idea that we’re translating from understanding how something works to using that knowledge to design a therapy or a cure to a particular disease. So now, (CIRM) wants the internships that they’ve funded through the Bridges Program to take a similar leap.”

# Uses of Stem Cell Research

- Tissue replacement
- Gene therapy
- Models of disease
- Drug screening and drug development
- Toxicity testing
- Cancer therapy development
- Drug delivery
- Basic knowledge of human development

# Our Translational and Clinical Programs are Targeting Treatments for 40+ Diseases

- 80 Active Programs
- \$627 million in Funding



# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease x 2
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2



# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2

# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2

# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2

# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2



# CIRM-funded Clinical Trials

- Spinal cord injury
- Diabetes
- Blindness AMD and RP
- Heart disease
- HIV x 3
- Sickle Cell Anemia
- Chronic Granulomatous Disease
- Various Solid Tumors x 2
- Leukemia
- Glioblastoma x 2

# Online Communications

Goal: To reach all demographics with information about CIRM's accomplishments

- Web page [cirm.ca.gov](http://cirm.ca.gov)
- Facebook
- YouTube (CIRMTV)
- CIRMResearch blog
- Flickr
- Monthly Digest

# CIRM Stem Cell Champions

## WHAT A CIRM STEM CELL CHAMPION DOES

- HELPS US CREATE A BETTER, MORE EFFICIENT WAY FOR FDA TO APPROVE STEM CELL TREATMENTS
- SUPPORTS CIRM'S MISSION AND SPREADS THE WORD ABOUT STEM CELL RESEARCH
- STAYS UP TO DATE ON THE LATEST STEM CELL RESEARCH NEWS

