

# President's Report

-Alan Trounson

-March 2008

# New Developments in Stem Cells

## ***Advanced Cell Technology Demonstrates Efficient Generation of Functional Hepatocytes (Liver Cells) From Human Embryonic Stem Cells. Agawal et al. Stem Cells 2008***

- Report a robust and highly efficient process for the generation of high-purity hepatocytes (liver cells). Interest is for both cell therapies and toxicity testing of drugs and environmental pollutants.

## ***Towards the generation of rod and cone photoreceptors for mouse, monkey and human embryonic stem cells. Osakada et al. Nature Biotechnology Feb 2008***

- ESCs can be directed to differentiate into both rod photoreceptors and cones using a cocktail of growth factors. These appear to be genuinely functional retinal progenitor cells that are capable of forming mature retinal pigment epithelial cells. The interest is for the correction of loss of sight.

# New Developments in Stem Cells

**Novocell/ Pancreatic endoderm derived from human embryonic stem cells generates glucose-responsive insulin-secreting cells in vivo. Kroon et al. 2008 Nature Biotechnology Feb 2008**

- The production of Beta Islet Pancreatic cells has been a difficulty from any source. The researchers have shown they can direct HESCs into endoderm the key derivative necessary to produce pancreatic cells. This endoderm will efficiently form glucose-responsive endocrine cells after implantation into mice. These cells protect mice from streptozotocin-induced diabetic hyperglycemia. Concerns remain about teratomas that formed which means undifferentiated cells must be filtered out. This work needs confirmation in other independent labs.

**Clinical applications of blood derived and marrow derived stem cells for nonmalignant disease. Burt et al. JAMA Feb 2008**

- Bone marrow HSCs, MSCs under appropriate conditions in some select patients provide ameliorating effects in some autoimmune and cardiovascular disorders. Clinical trials are needed to define the patients treatment parameters and adverse effects.

# New Developments in Stem Cells

## Marked differences in differentiation propensity among human embryonic stem cell lines. Osafune et al. Nature Biotechnology 2008

- 17 human embryonic stem (hES) cell lines was compared. Some lines exhibit a marked propensity to differentiate into specific lineages, often with >100-fold differences in lineage-specific gene expression. For example, HUES 8 is best for pancreatic differentiation and HUES 3 for cardiomyocyte generation.

## Cell Stem Cell March 2008

- Researchers at the Gladstone Institute of Cardiovascular Disease (GICD) and the UCSF have identified how tiny genetic factors called microRNAs may influence the differentiation of pluripotent embryonic stem (ES) cells into cardiac muscle. They found that miR-1 and miR-133 are active at the early stages of heart cell formation, when an ES cell is first "deciding" to become mesoderm and then cardiac muscle cells

# Personnel

## Scientific Officers

**Sohel Talib** (formerly with Geron)

**Rosa Canet-Aviles** (formerly with Amgen)

## Paralegal

**Cynthia Schaffer**

# Upcoming Grant Reviews

Major Facilities Part II

Disease Team Planning Awards (RFA 07-04)

New Cell Lines Awards (RFA 07-05)

# Current RFAs

CIRM New Faculty Awards

Part II

55 LOIs

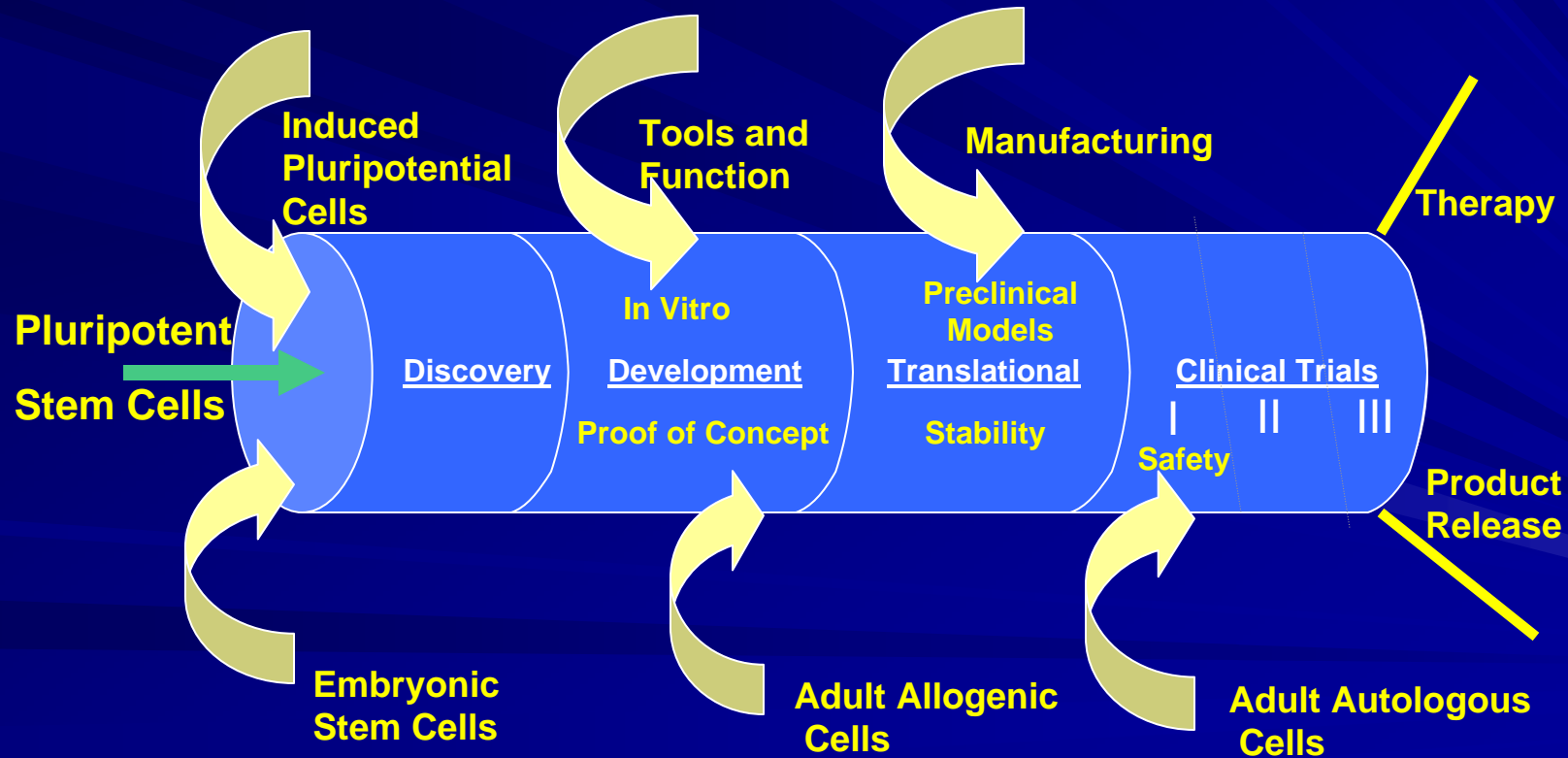
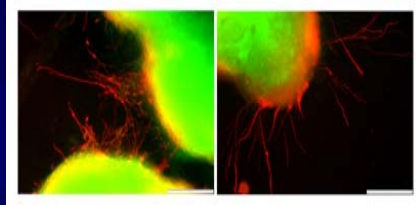
(31 Institutions)

# Upcoming RFAs

Tools and Technologies  
Training Grants II (continuation)  
Technical Training Grants  
(under construction)



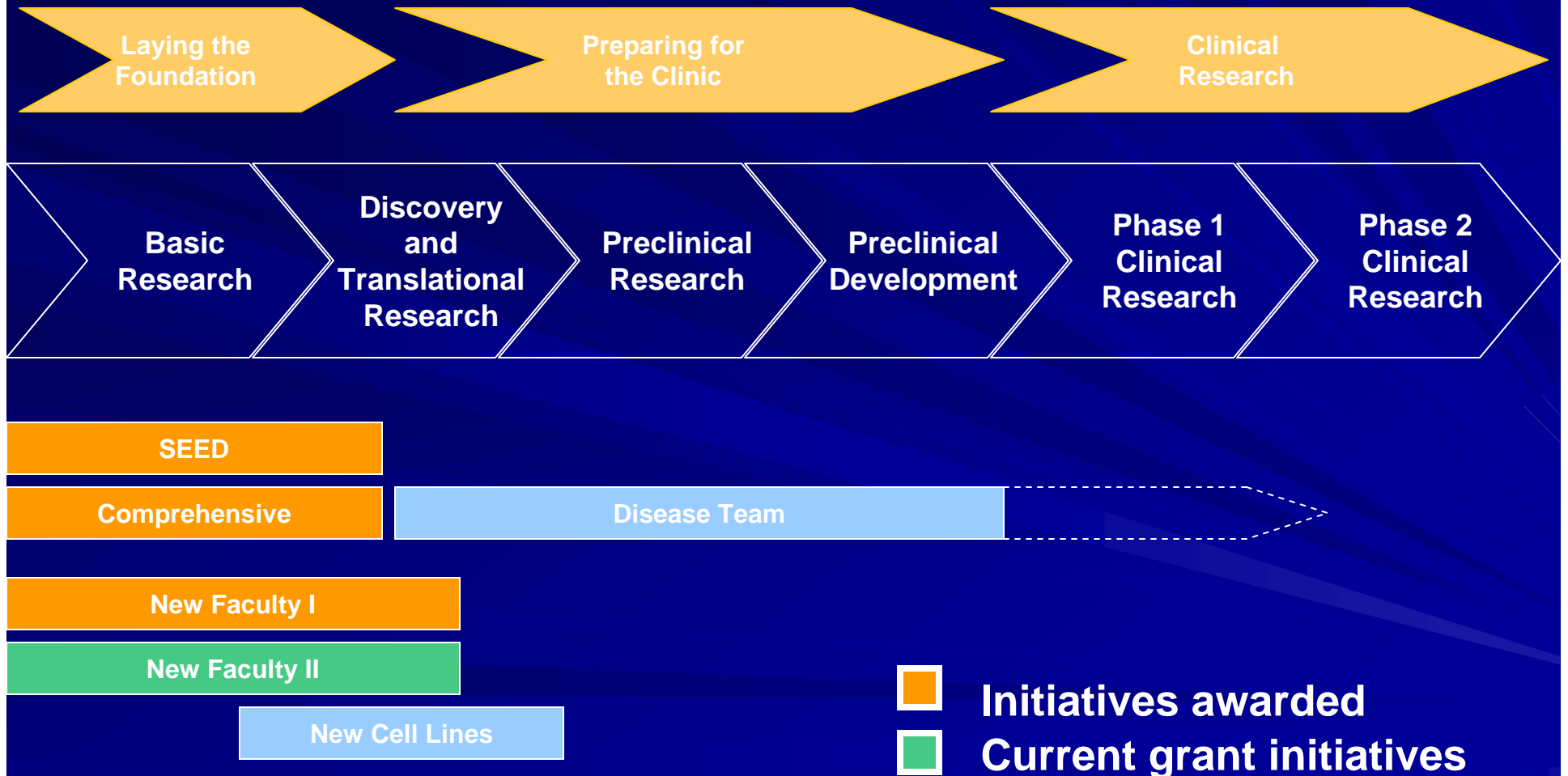
# Stem Cell Pipeline



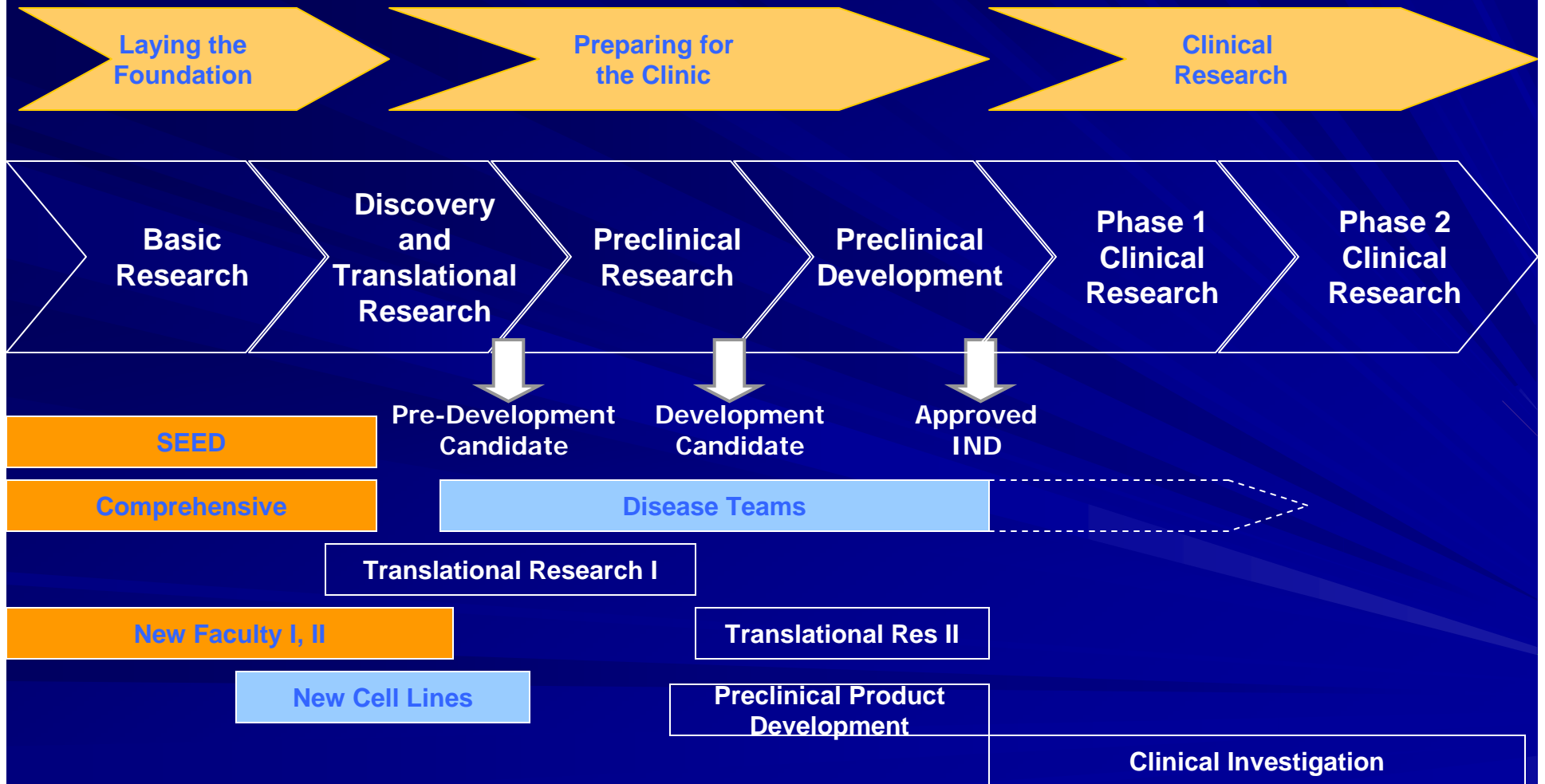
# CIRM research grants approved by ICOC

- 123 individual research grants (total of 156 grants);
- 55 study basic biological mechanisms, or technologies that could impact the development of cures and therapies;
- 68 study mechanisms that are related to a particular disease.

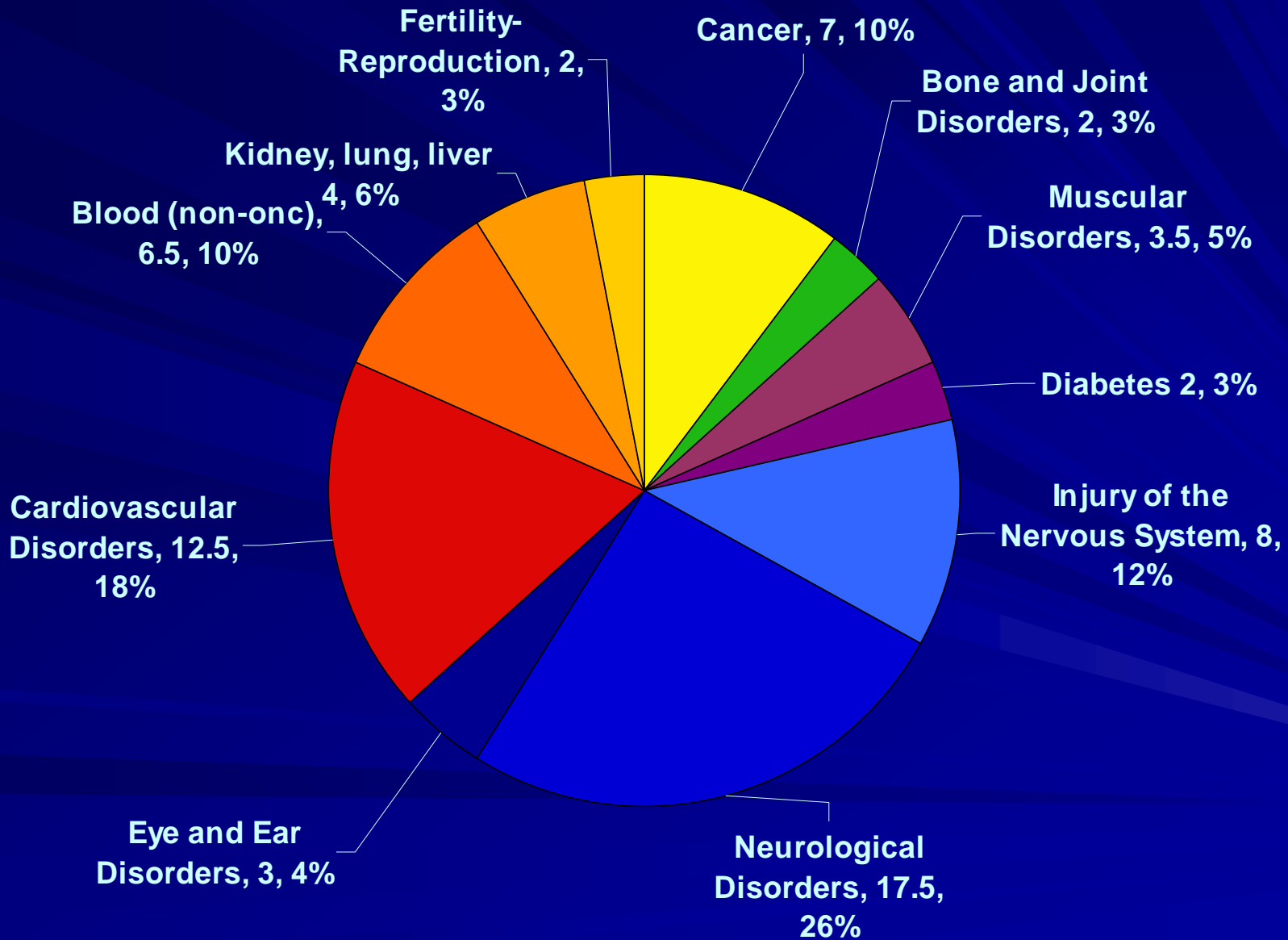
# Moving Discoveries into the Clinic: The Translational Pipeline



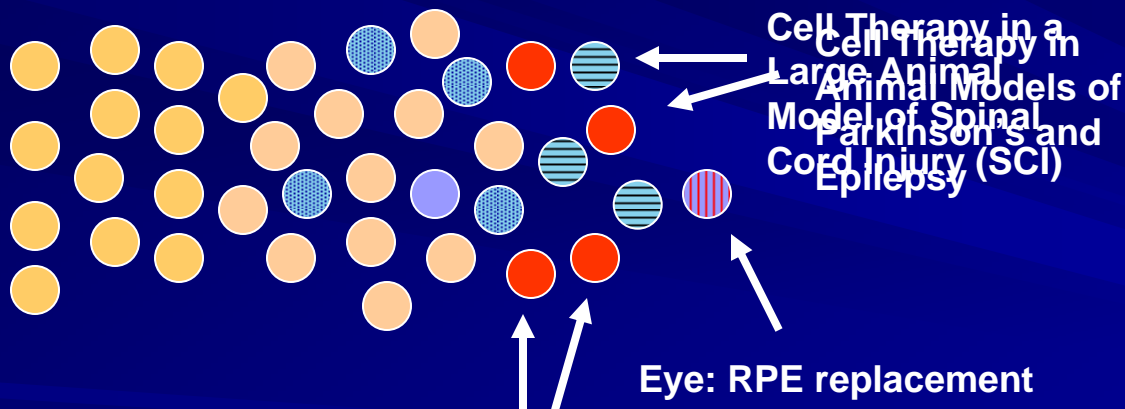
# Moving Discoveries into the Clinic: The Translational Pipeline



# Disease-Related Grants Funded by CIRM (n=68)



# Case Study: Neurobiology



Screening or Optimizing a Drug Candidate in a Cell-Based Model of Alzheimer's Disease

## Discovery

- Neurological Disorder
- Injury and Stroke
- Sensory System Disorders

## Translation

- Neurological Disorder
- Injury
- Sensory System Disorders

# President's Report Updates

- ISCF 2008 Annual Meeting and International Connections
- FDA - Clinical Trials for hESCs
- Biotech and Pharma Interests
- SCO Audit