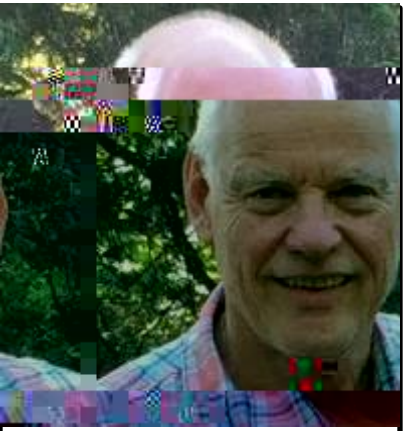
Animal-Fluid Interactions

High speed imaging and fluid analysis

Jack Costello
Rowe 301
costello@providence.edu

Architectural Dynamics in Living Cells, Tissues, and Whole Organisms



Rudolf Oldenbourg
Lillie 110
rudolfo@mbl.edu

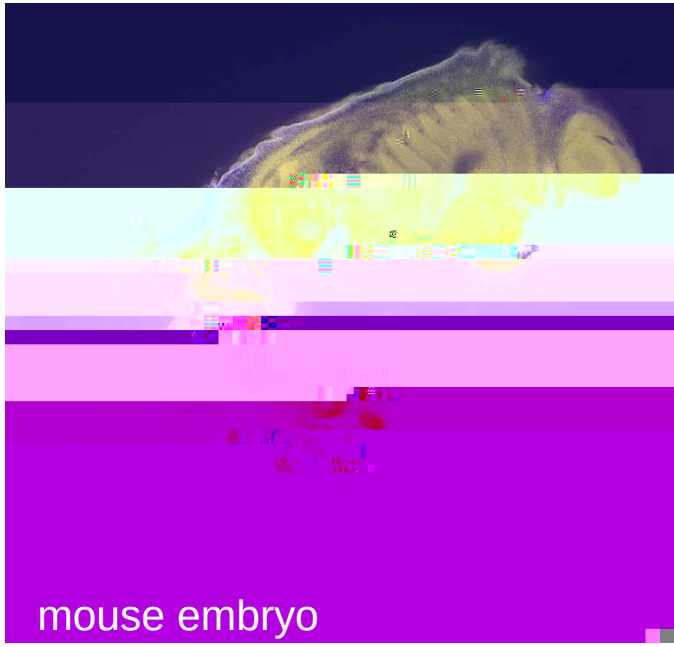
by Jim LaFountain

LC-PolScope

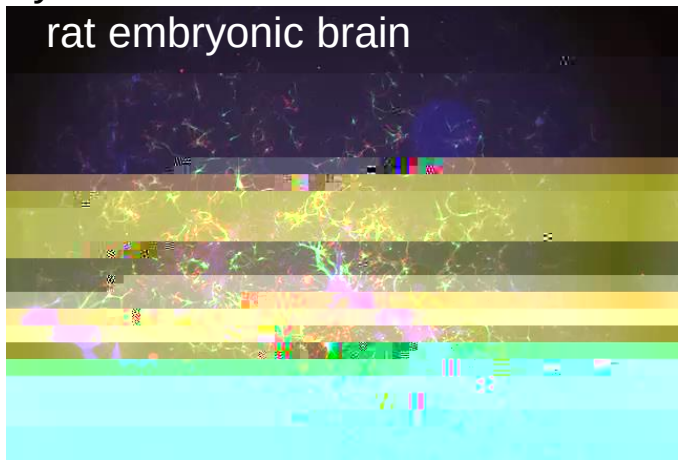
by Maki Koike-Tani

Mesolens

5 x 5 x 3 mm^3
@ 0.5 µm resolution



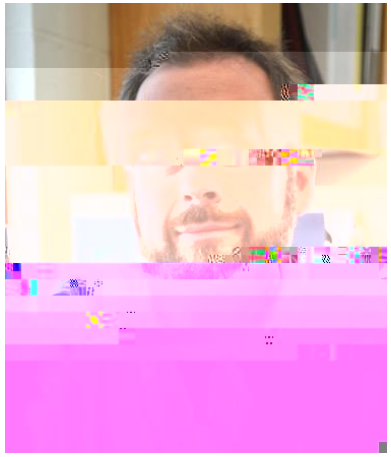
by Brad Amos and Gail McConnell



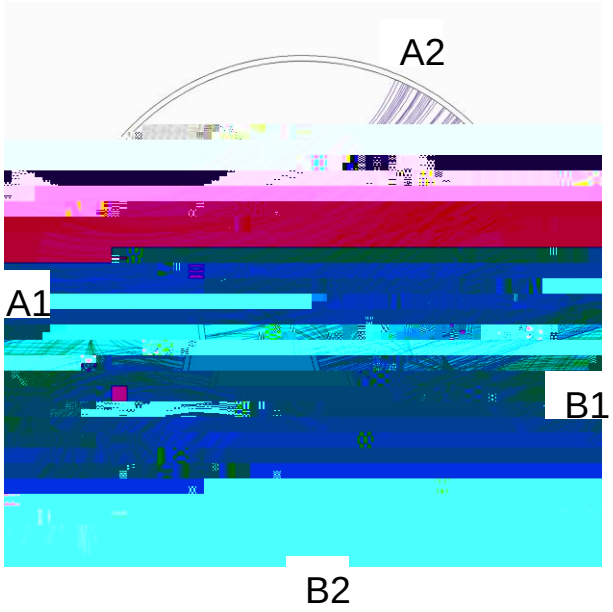
Genetic Novelty in DNA Repair

Genome Evolution in Response to Stress

XRCC4 A1 B1

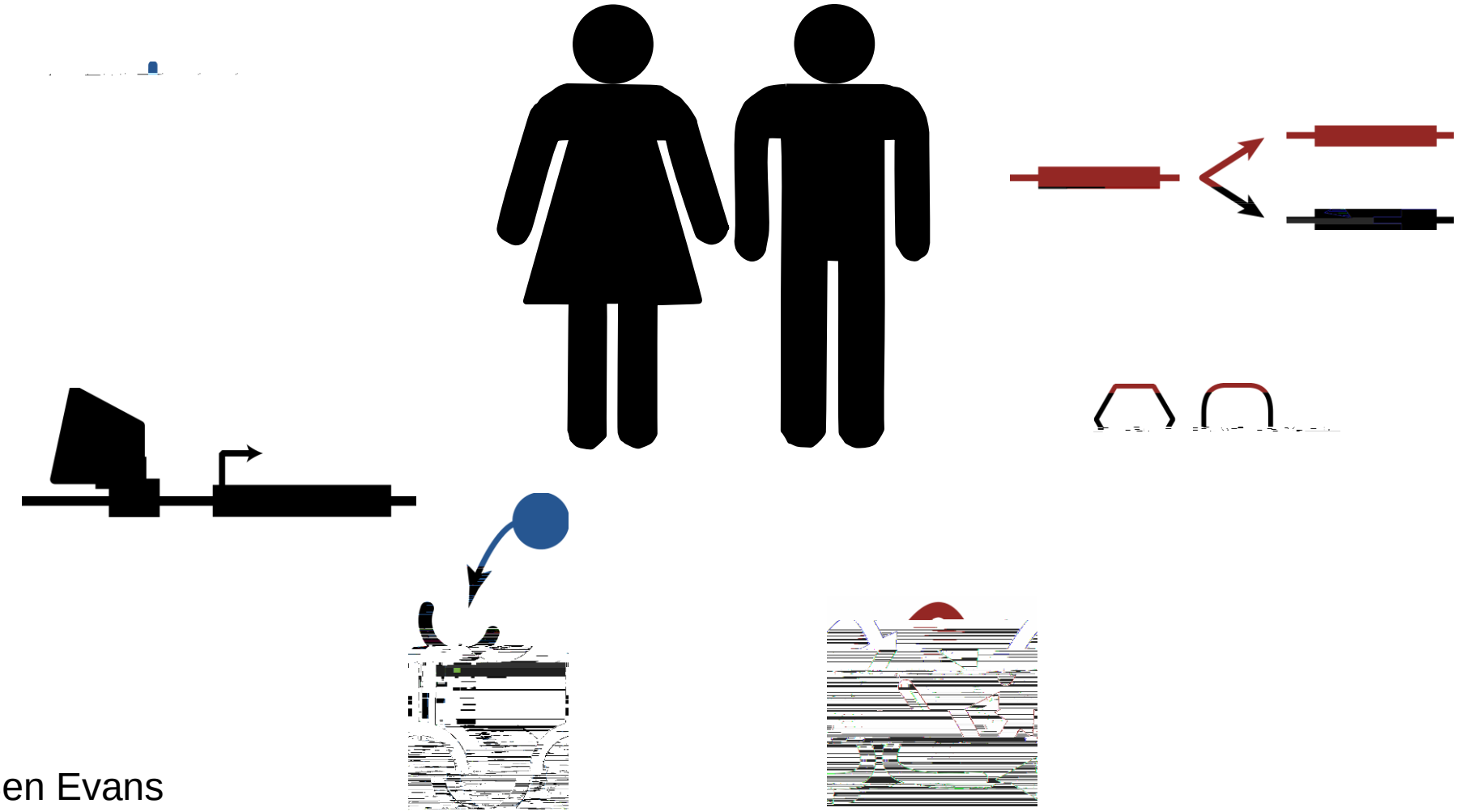


David Mark Welch
Lillie 319
dmarkwelch@mbl.edu



LigK A1 B1

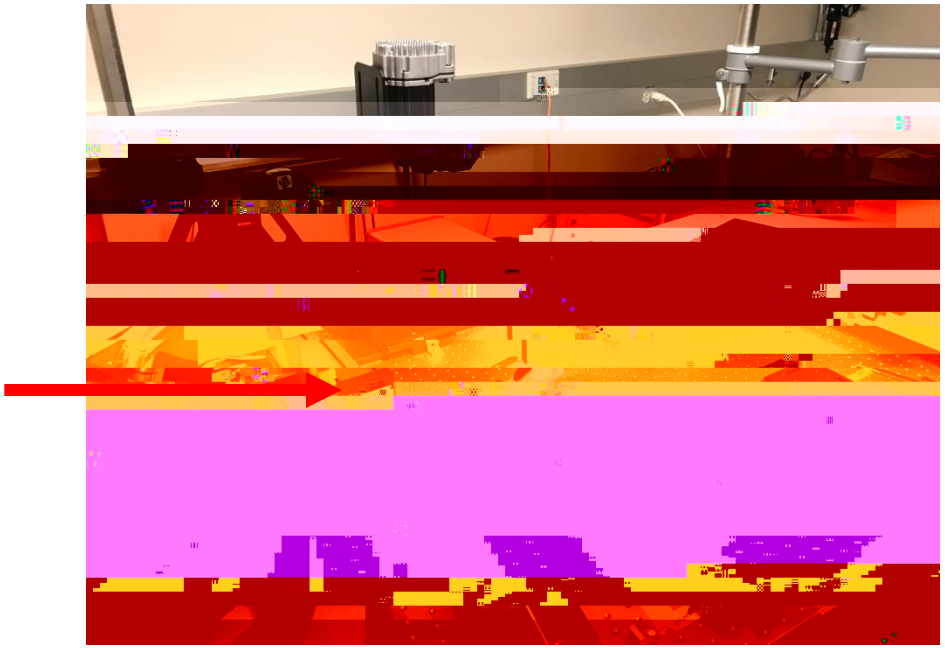
How do fundamentally important features evolve?



Ben Evans
evansbenj@gmail.com

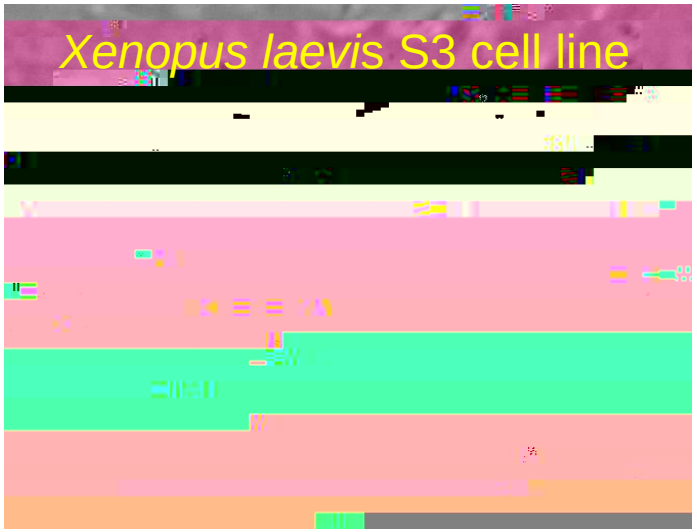
How does body shape and stiffness affect swimming performance in fishes?

Fluid-structure interaction and flow visualization



Eric Tytell
Rowe 326
eric.tytell@tufts.edu

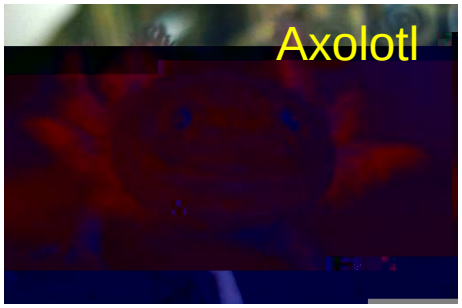
New methods to make mutants in frogs, etc



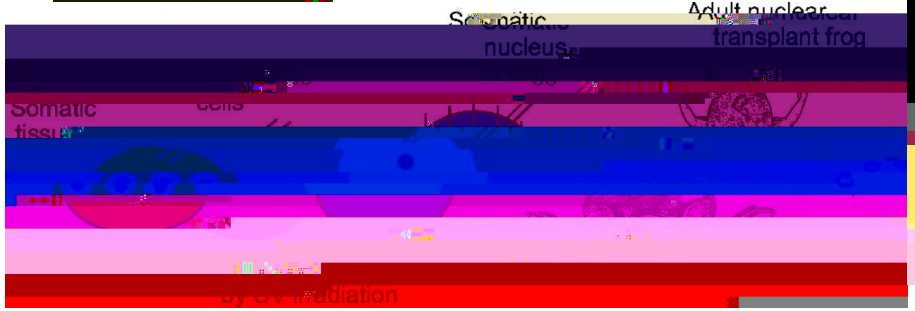
2015: 1 *X. laevis* and 4 *X. tropicalis* cell lines
Normal ploidy
2017: Gene editing in cell lines (CRISPR)
Transfer nucleus to egg
Mutant animals without breeding

Gary J Gorbsky
Rowe 326 & NXR
GJG@omrf.org

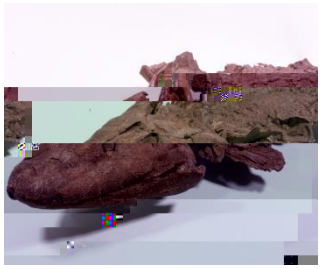
John Gurdon
2012 Nobel Prize in Physiology or Medicine

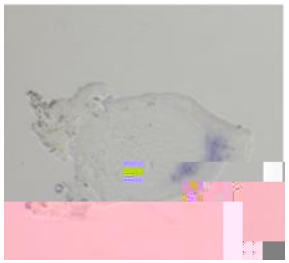


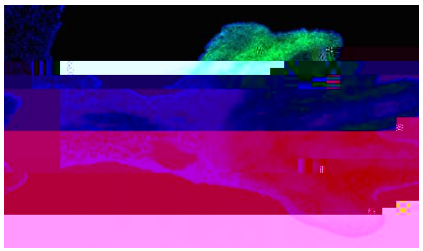
Nematostella

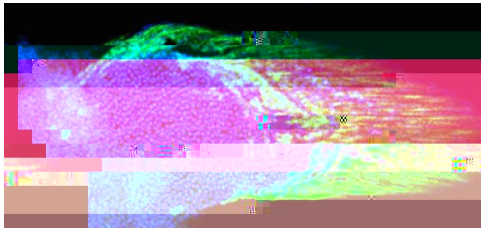


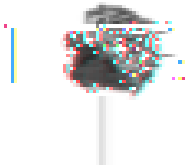
Finding Your Inner Fish











Neil Shubin

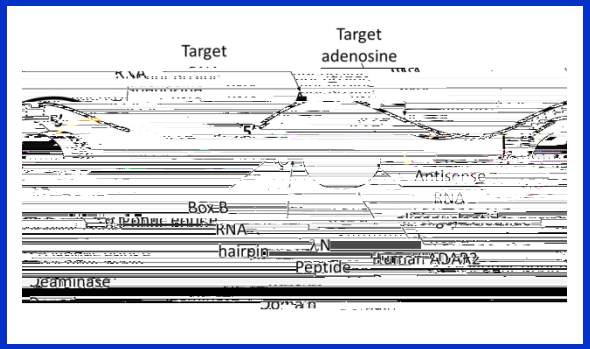
Manipulation of biological information within RNA

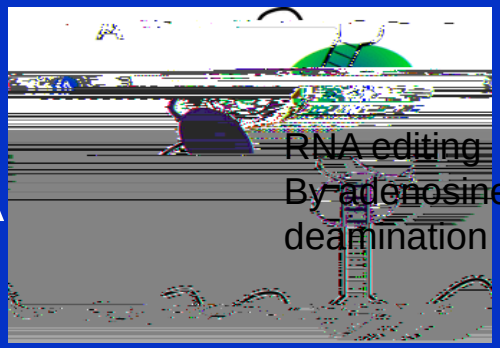
DNA

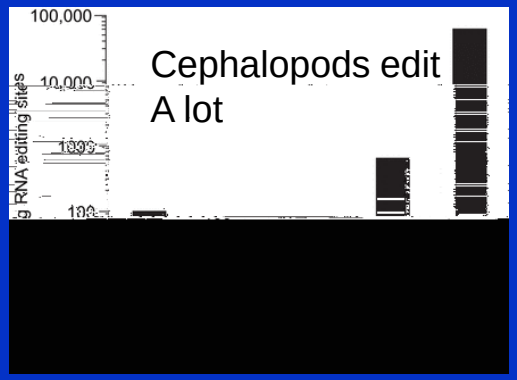
RNA

Protein

Site-directed
RNA editing



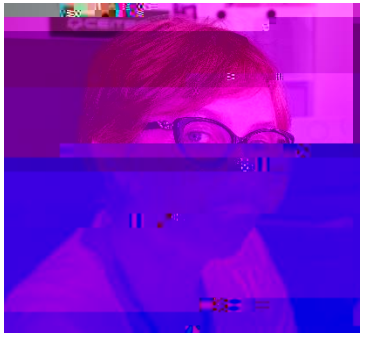




Genetically
tractable
Marine models

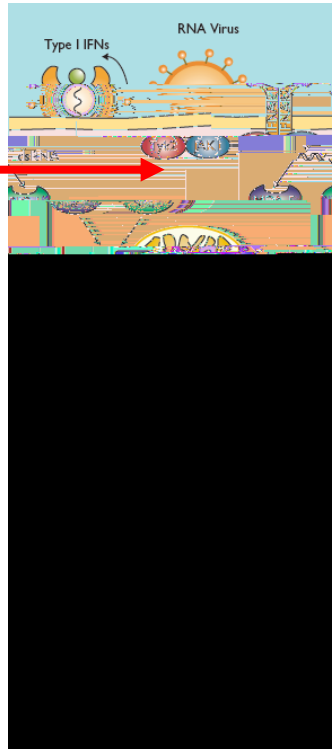
Josh Rosenthal
Rowe 411

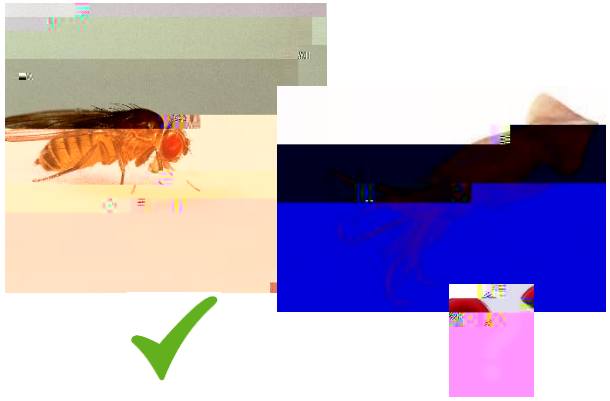
RNA modification and innate immunity



Rowe 422
mary.oconnell@ceitec.muni.cz

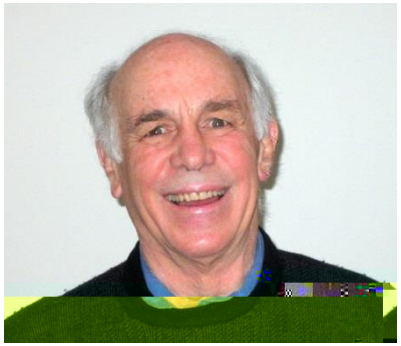
A-I





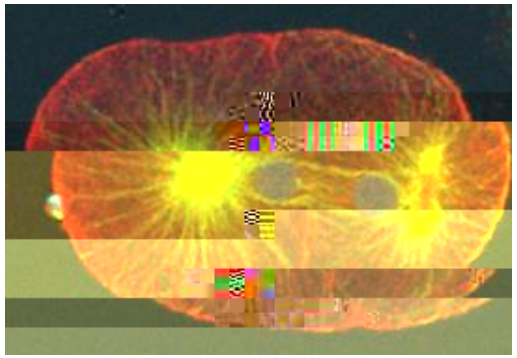
Imaging of dendritic function

Simultaneous sodium-calcium imaging



Bill Ross
Rowe 206
ross@nymc.edu

Asymmetric cell division

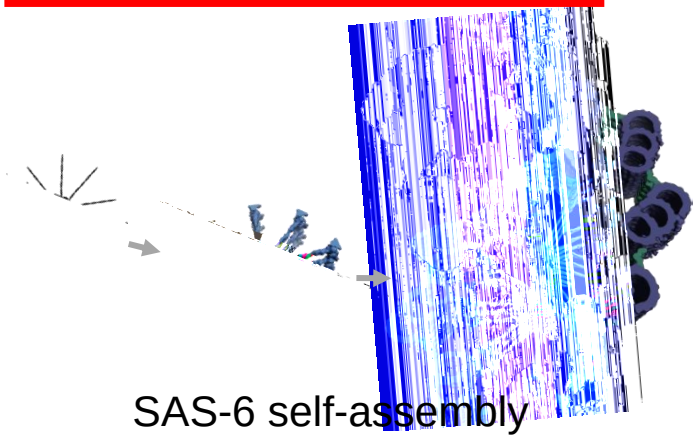


C. elegans embryo

Pierre Gönczy
Whitman fellow, Lillie 104
pierre.gonczy@epfl.ch

Swiss Federal Institute of Technology
Lausanne, Switzerland (EPFL)

Centriole assembly



SAS-6 self-assembly

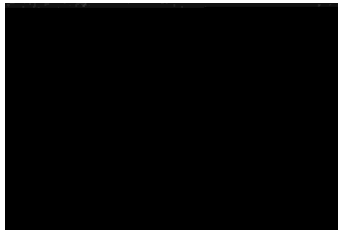
@MBL: Centriole elimination

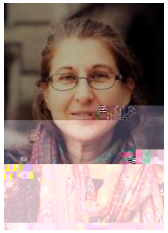
Joana Borrego Pinto and Marie Pierron

Establishing and Stabilizing Developmental Programs Through DNA Replication

Chris Sansam
Rowe 210
Chris-Sansam@omrf.org

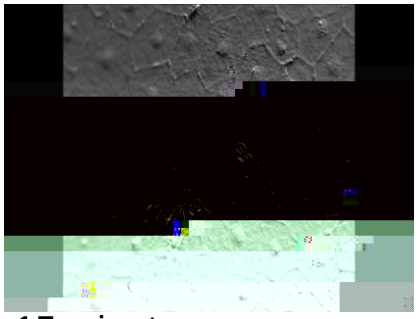
Wound Healing in Clytia hemisphaerica



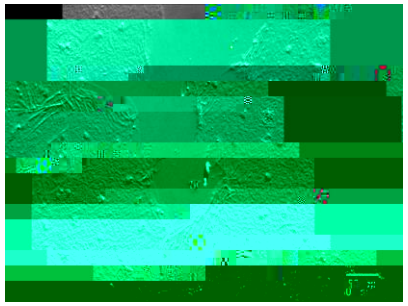


Jocelyn Malamy
The University of Chicago
Rowe 219

20 minutes



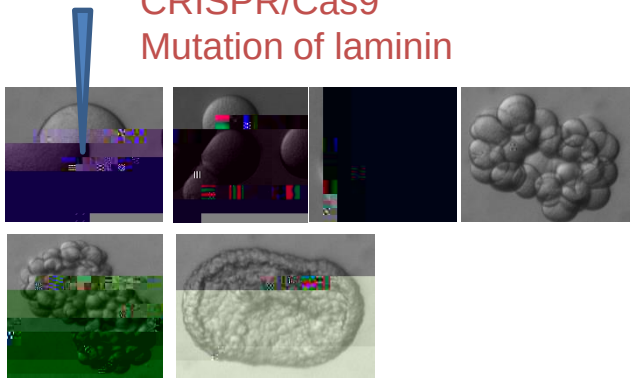
15 minutes



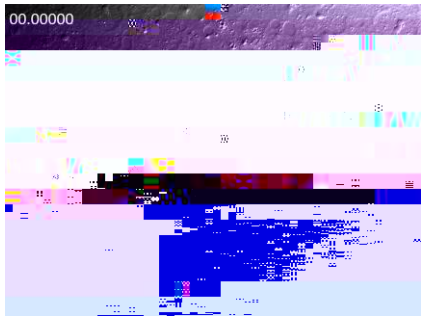
16 minutes

32 minutes

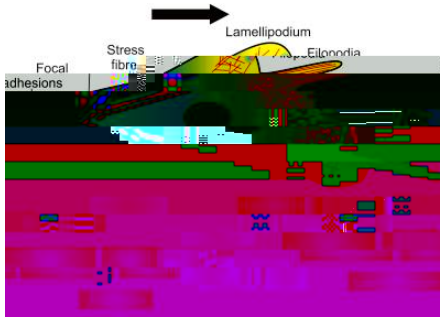
Goal 1:
CRISPR/Cas9
Mutation of laminin

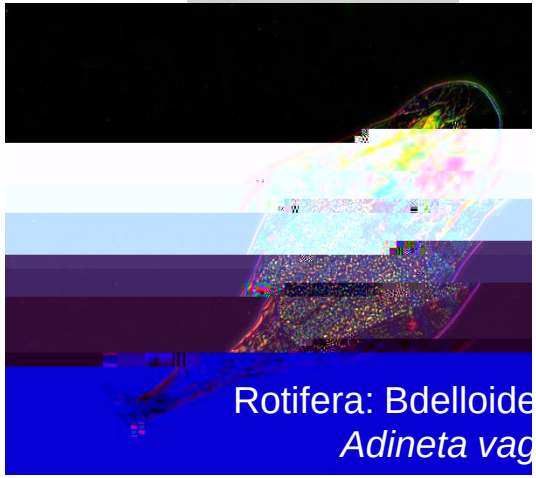


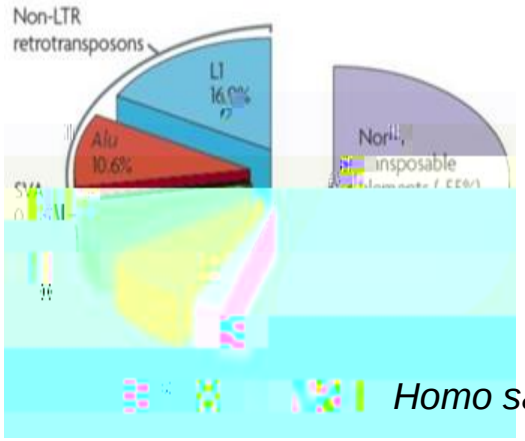
Goal 2: Analysis of single-cell wounds



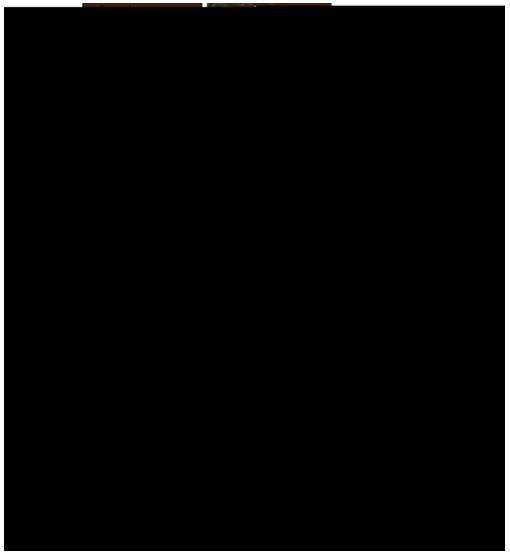
Goal 3: Analysis of the role of Rho GTPases







Homo sapiens



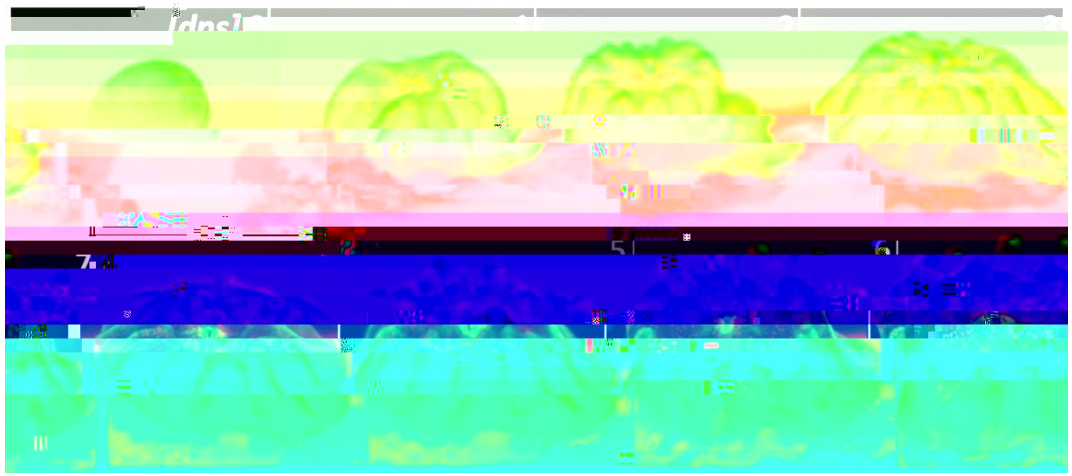
Photomicrography: M. Shribak, MBL

All stressed out

The response to ER and epigenetic stress causes disease

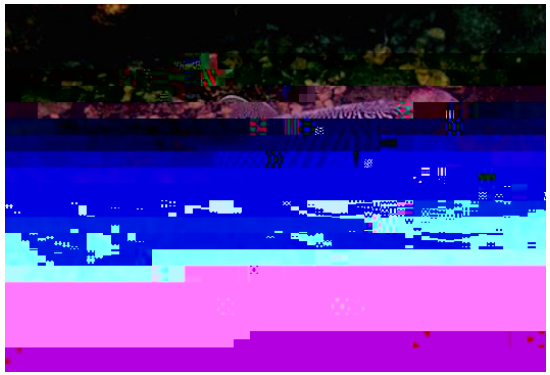
Kirsten Sadler (Edepli)

A light

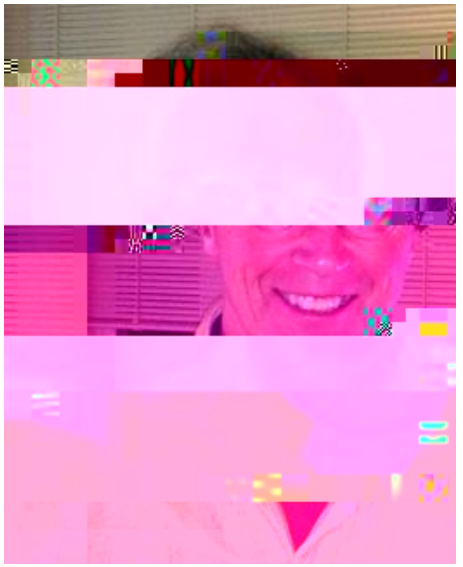


Rapid Adaptive Coloration

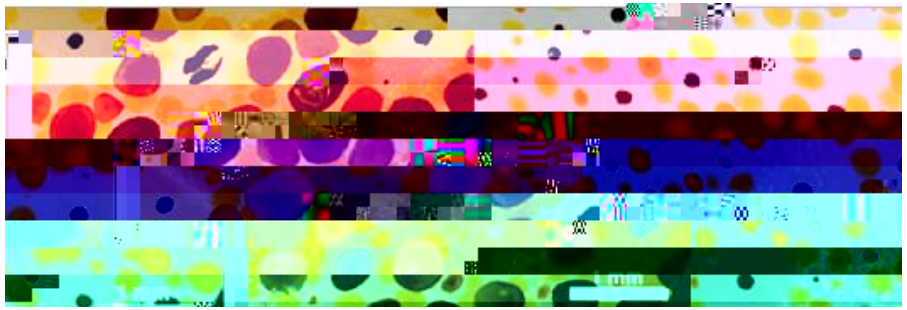
Visual perception, sensorimotor system, skin bio-photonics

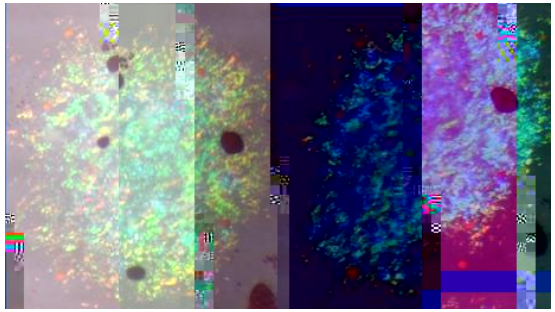


200 800ms camouflage change visually guided

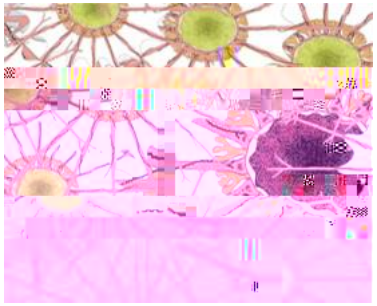


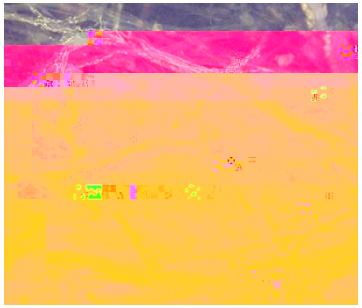
Roger Hanlon
MRC 215
rhanlon@mbl.edu



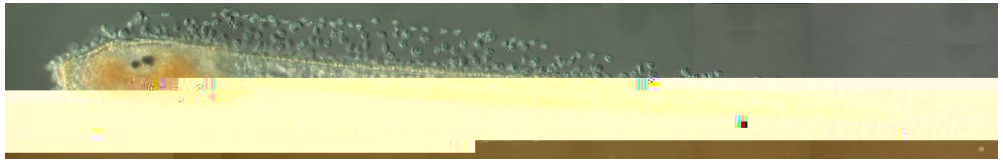


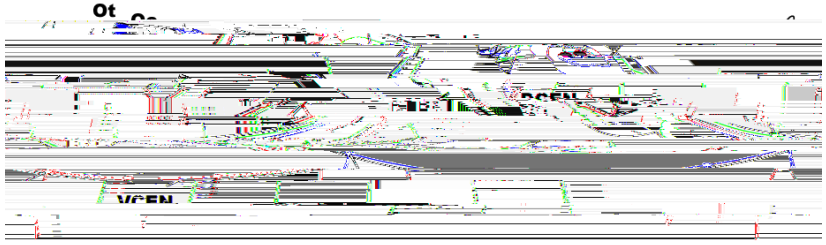
Neural control of skin pigments and reflectors

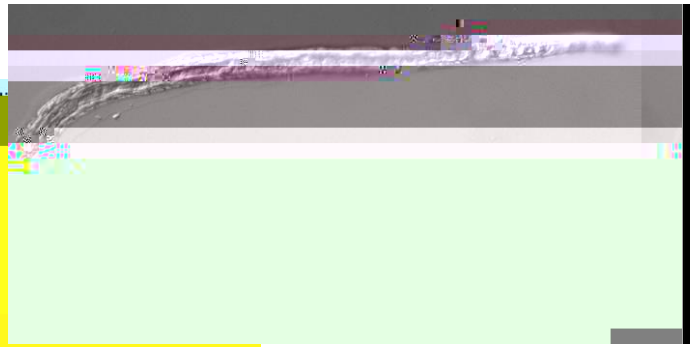


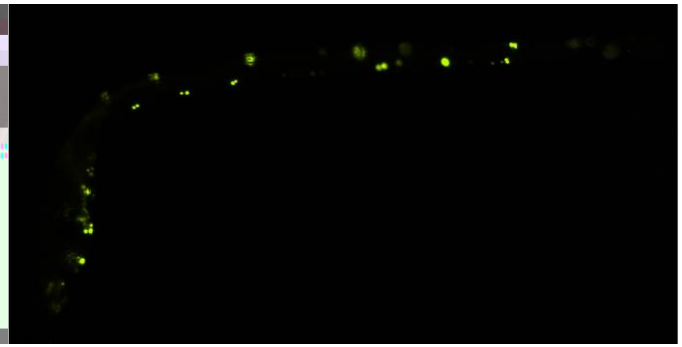


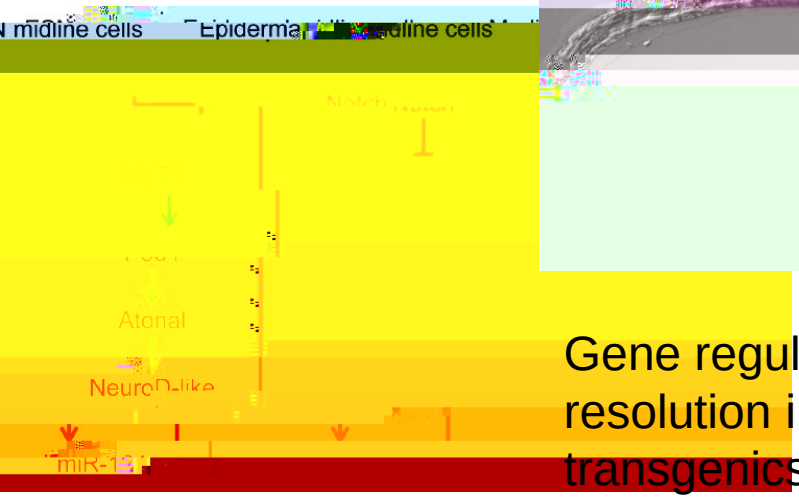
Imaging of ultrastructure











Gene regulatory networks, genomics, bioinformatics, high resolution imaging, CRISPR-Cas9, Notch signaling, transgenics, knock-ins/outs

San Diego State University

Bob Zeller; rzeller@mail.sdsu.edu; Embryology (2nd floor Loeb)