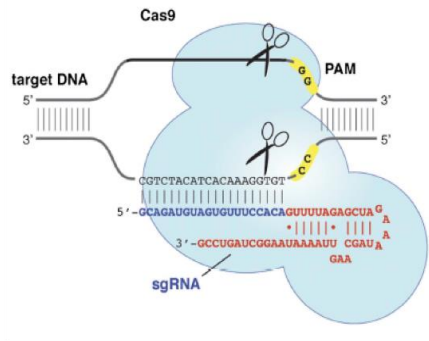


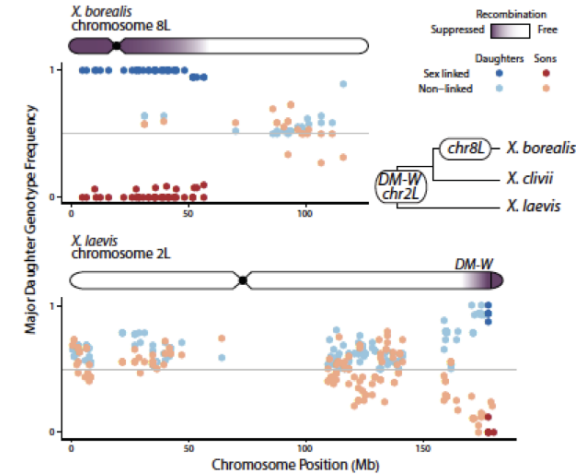
Xenopus and Genome Editing

Marko Horb
Rowe 413
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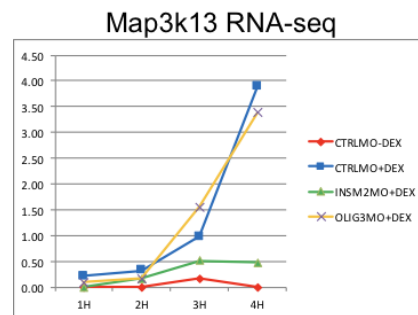
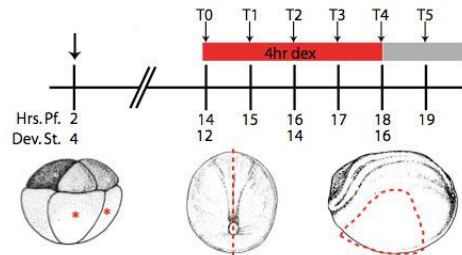
1) Develop new models of human disease using CRISPR-Cas



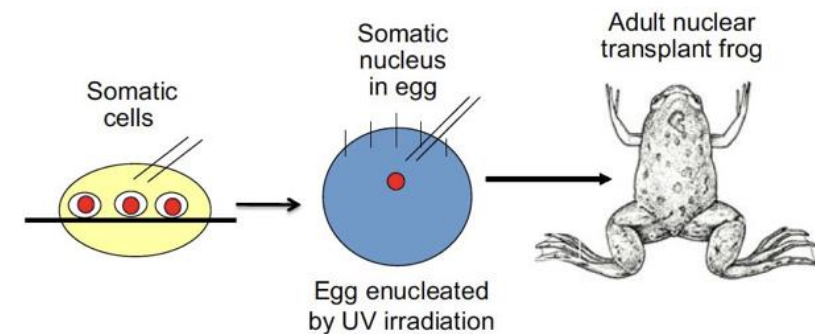
3) Sex determination



2) Pancreatic beta cell GRN

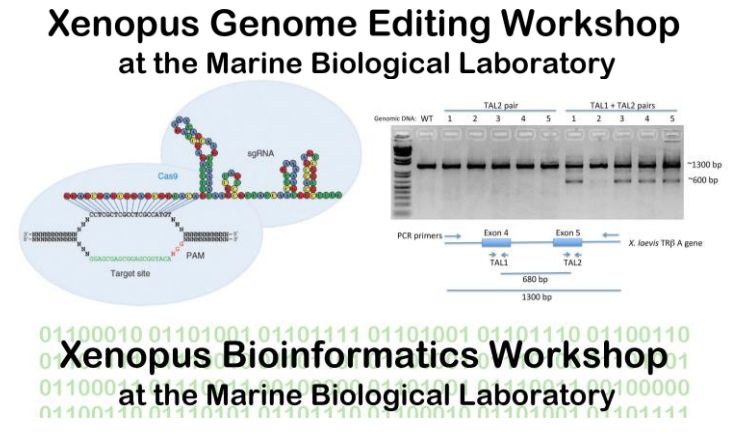
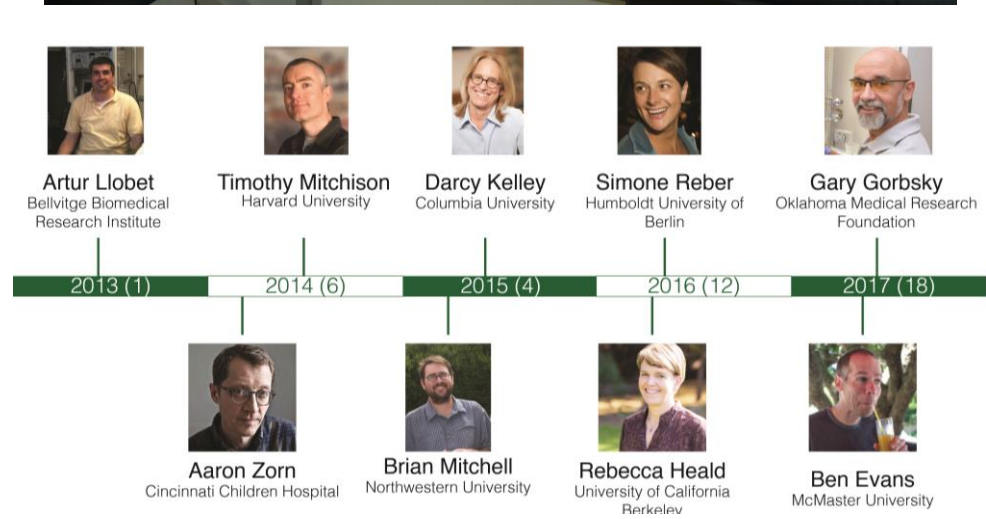
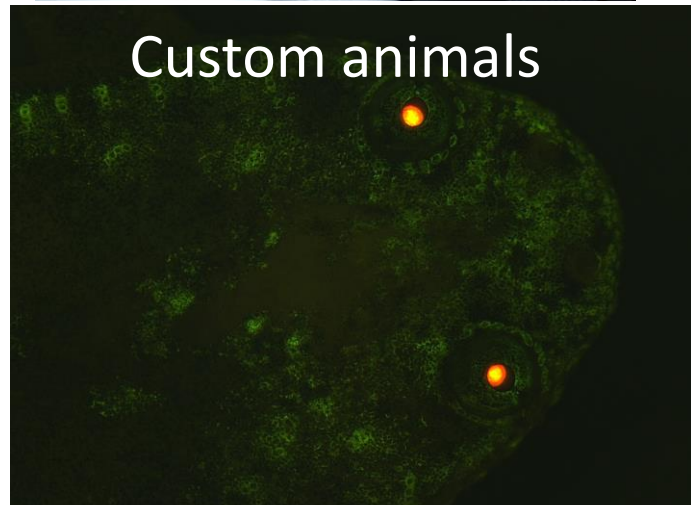
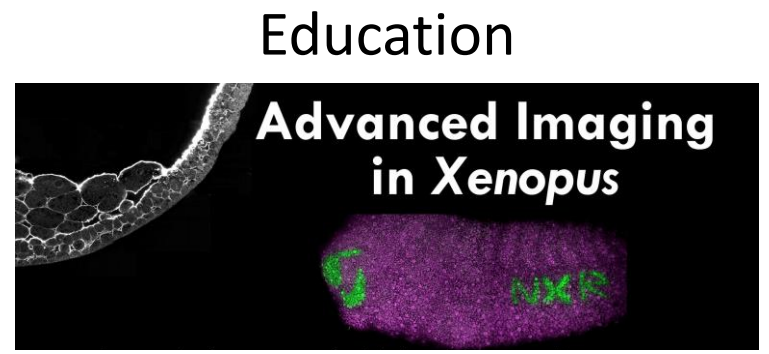
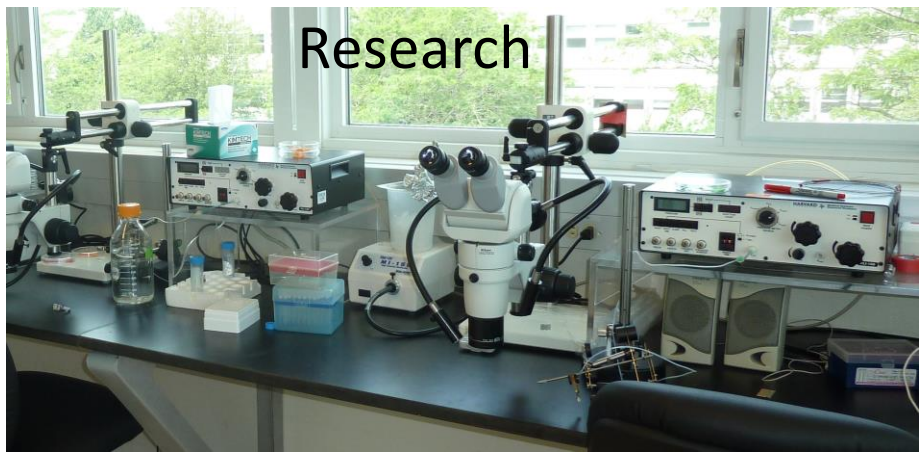
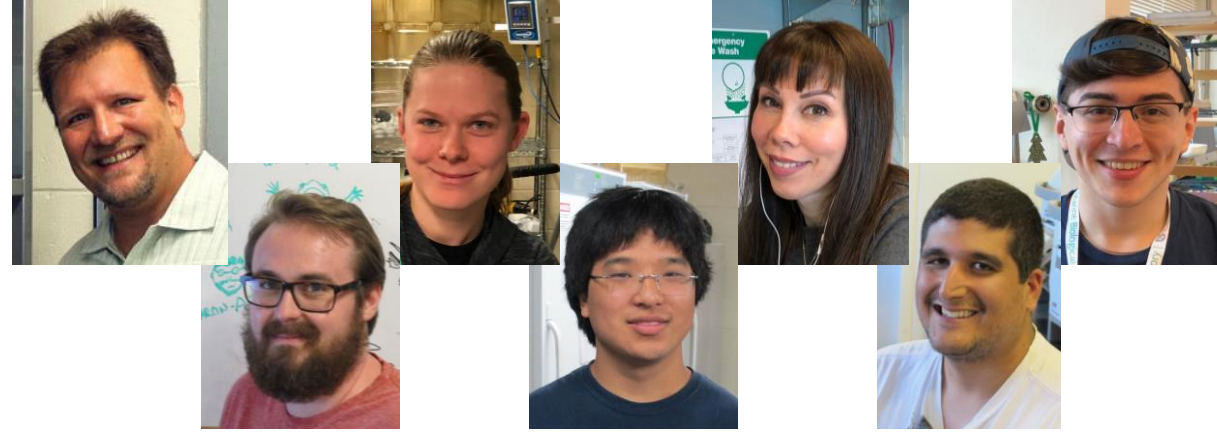


4) Nuclear transfer from engineered cell lines





www.mbl.edu/xenopus
xenopus@mbi.edu
mwlizla@mbi.edu
 Rowe 423, Loeb G12



Breaking the neural code of *Hydra*

Rafael Yuste, Rowe 211
rafaelyuste@columbia.edu



DNA

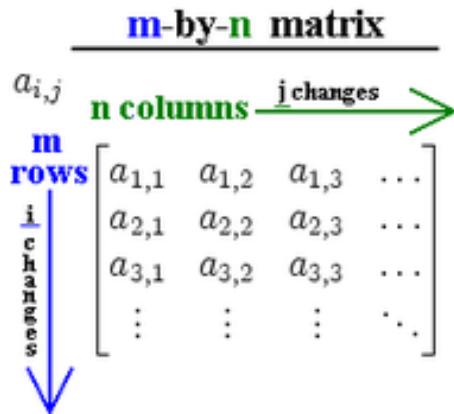


RNA

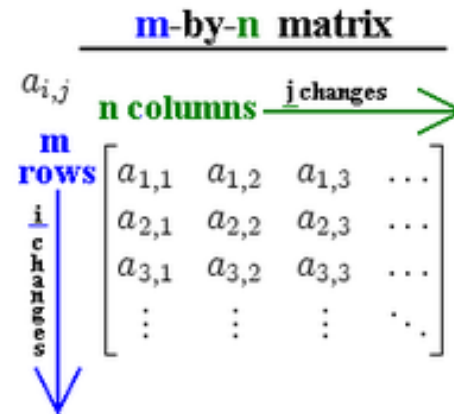


Protein

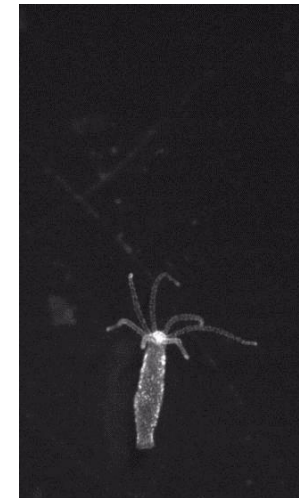
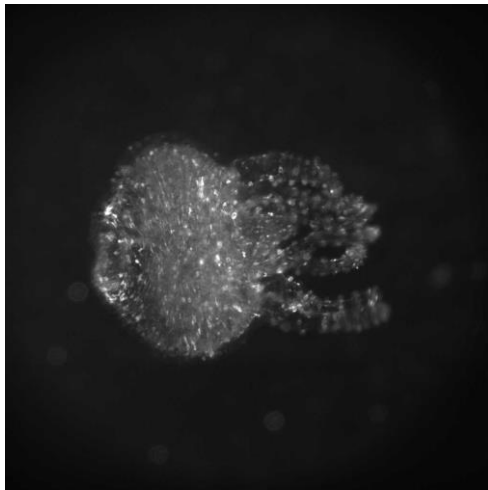
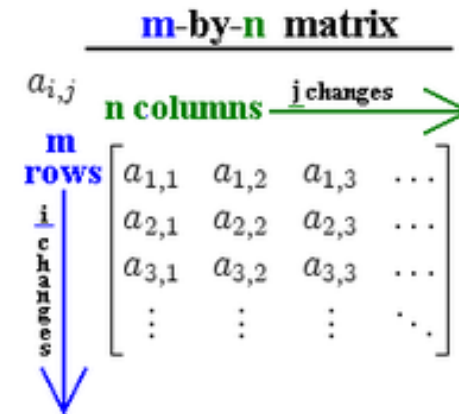
Neural activity matrix



Muscle activity matrix

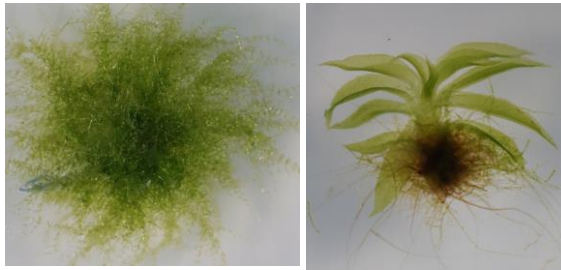


Behavior matrix

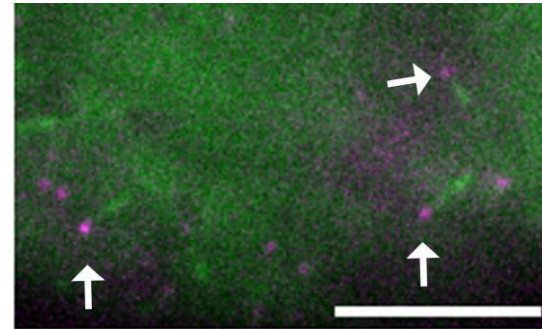


Moss imaging with TIRF microscopy

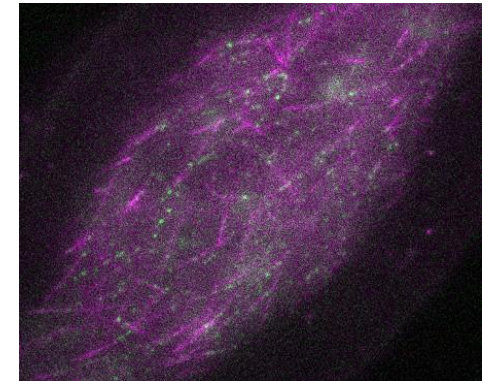
Physcomitrella patens



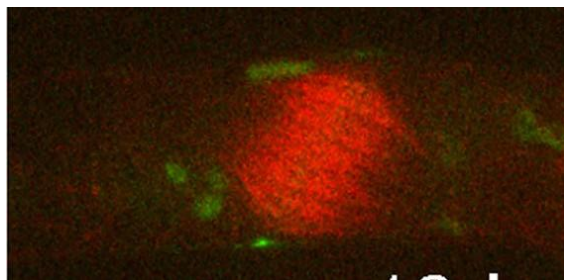
Microtubule nucleaBon
(MBL 2011)



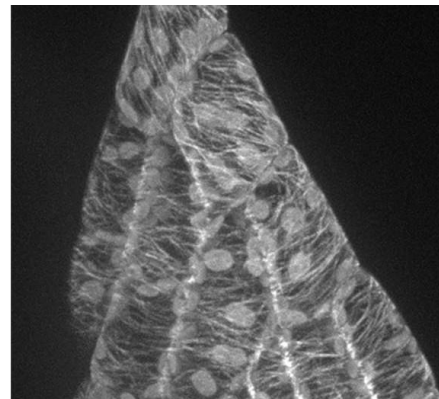
Motor moBility
(MBL 2014)



Cell division



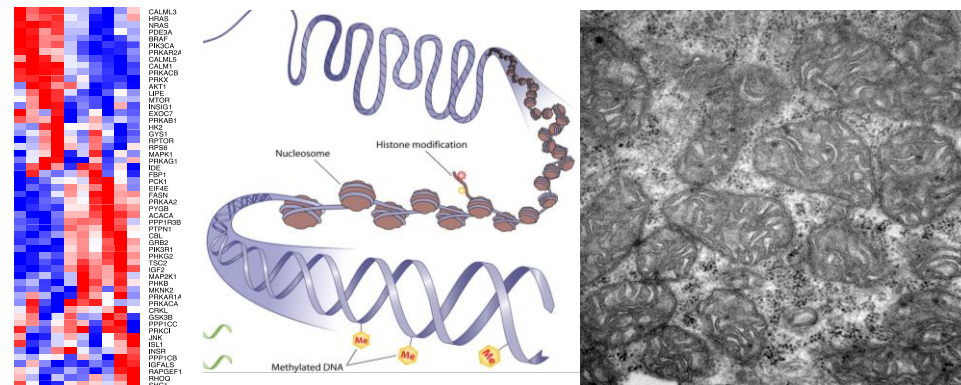
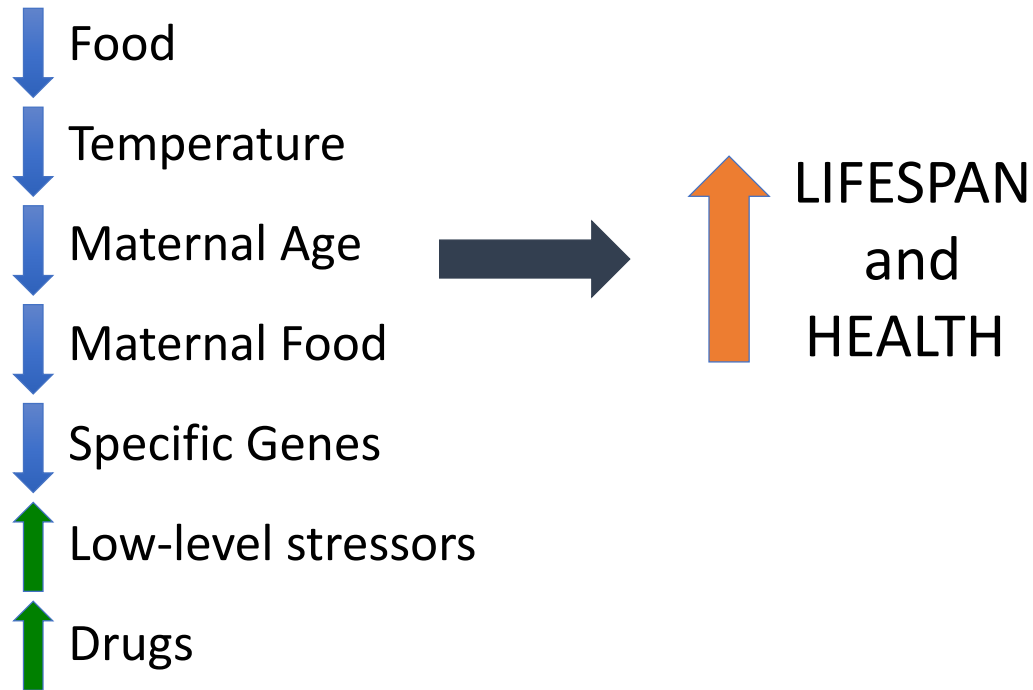
Leaf



Gohta Goshima
Nagoya University, JPN
Lillie 223

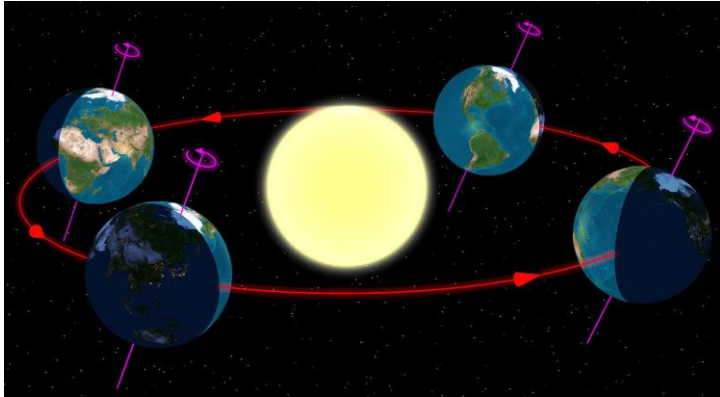
Maternal effects and aging: Rotifers as a model system

Kristin Gribble, Assistant Scientist, MBL



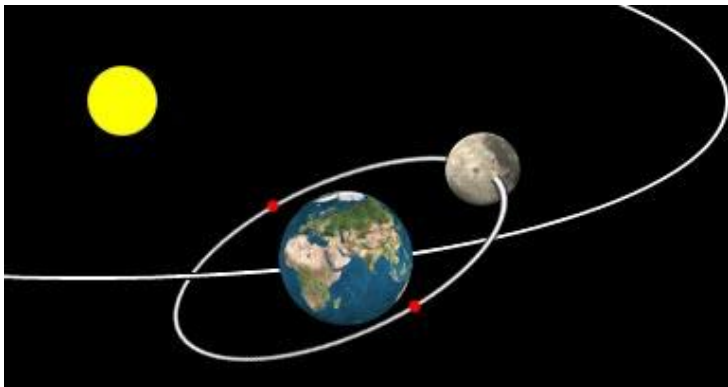
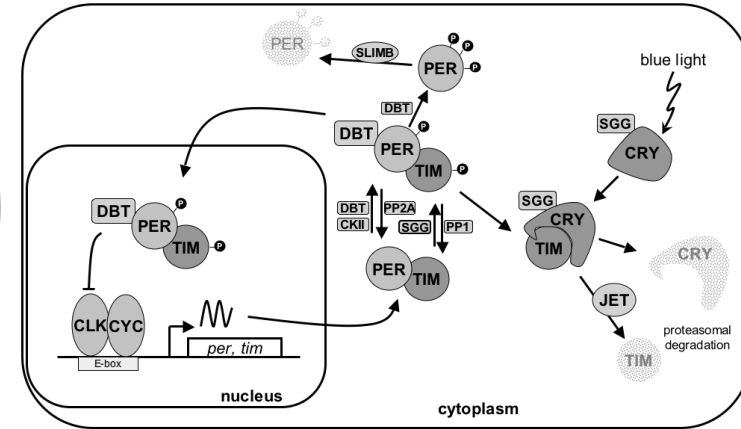


Patrick Emery: Chronobiology



Seasons > circannual clocks
(1 year)

Day/night > circadian clocks
(24 hours)

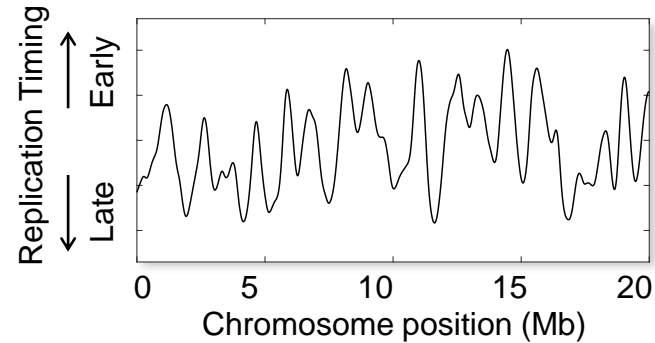
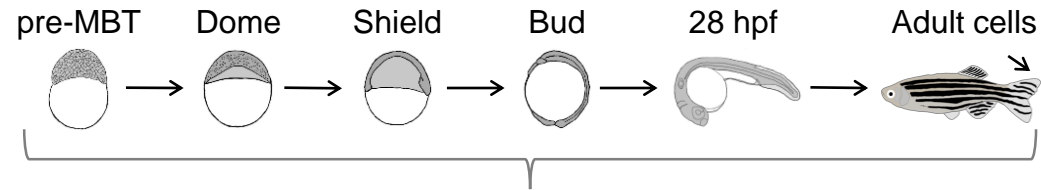


Lunar month > circalunar clocks
(29.5 days)

Tides > circatidal clocks
(12.4 hours)



Establishing and Stabilizing Developmental Programs Through DNA Replication



Stage-specific replication timing analysis



Chris Sansam
MRC 306

Chris-Sansam@omrf.org

1. Mechanisms and Functions?
2. Cell lineage variation?
3. Cell-to-cell variation?

Ciona intestinalis

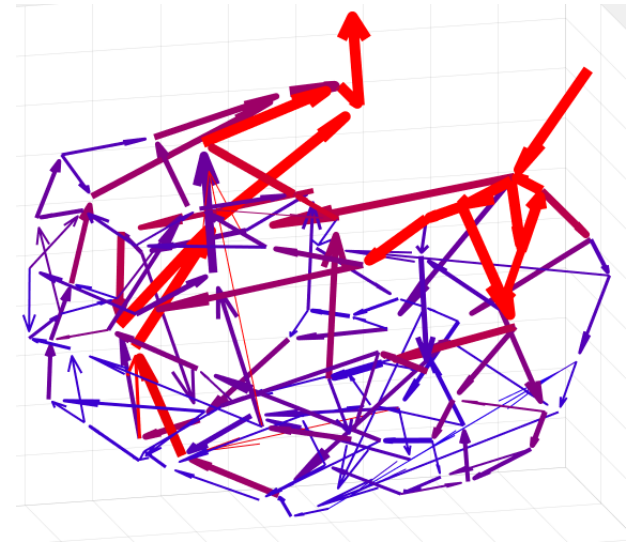
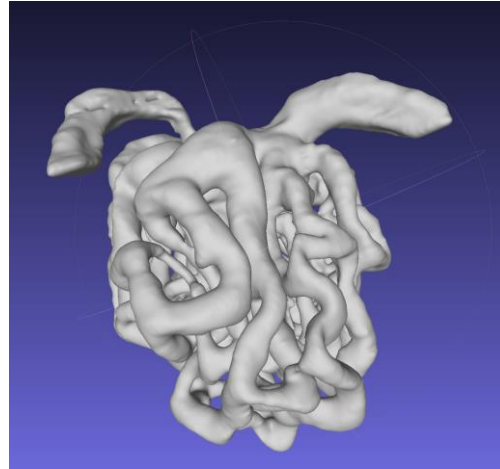
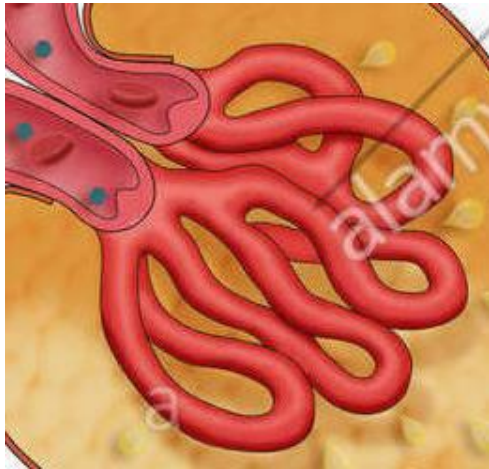
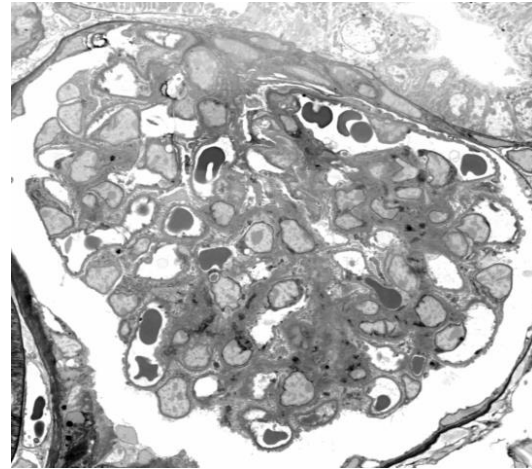
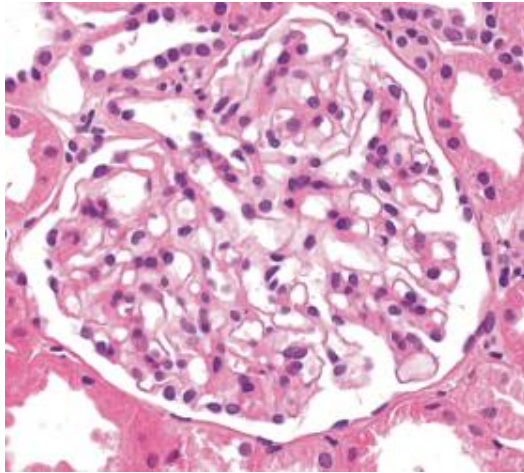


Why Ascidians?

1. Studied for >100 years.
2. Small genomes
3. Can obtain thousands of embryos
4. Easy genetic manipulation

Half micron sections for 3D histology

Mark Terasaki; Univ Connecticut Health Center; terasaki@uchc.edu



How different body shapes are generated during deuterotome evolution?



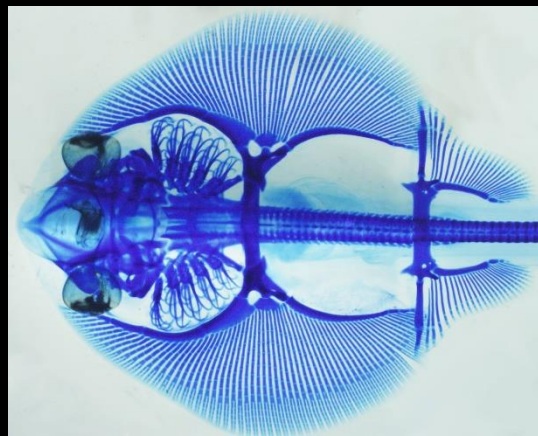
What is the contribution of regulatory regions to evolution?

Epigenomics: ChIP-seq, ATACseq

3D Chromatin structure: 4C-seq, HiChiP, HiC

Functional studies in zebrafish/medaka/Xenopus

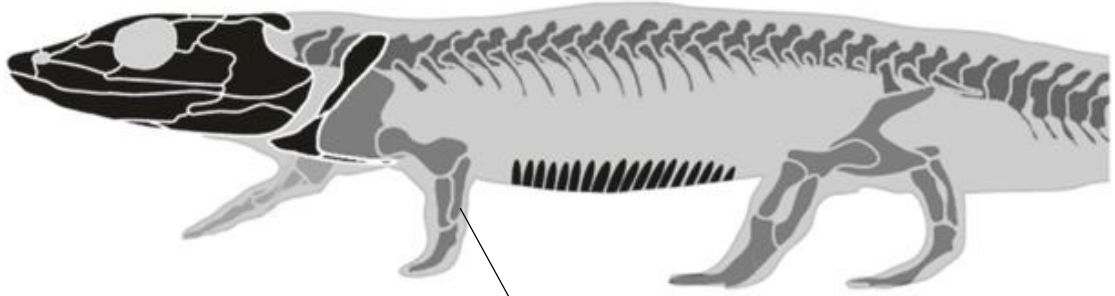
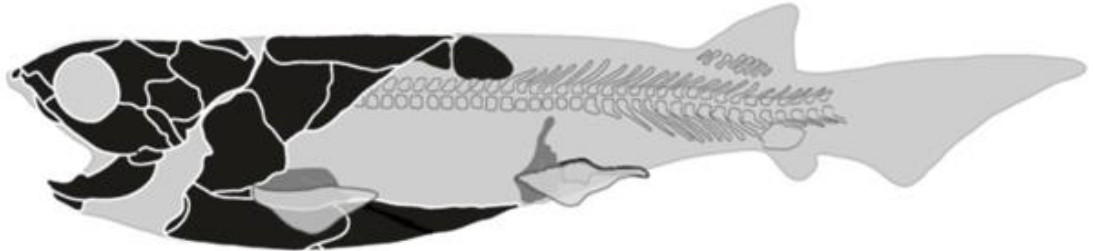
nature
genetics



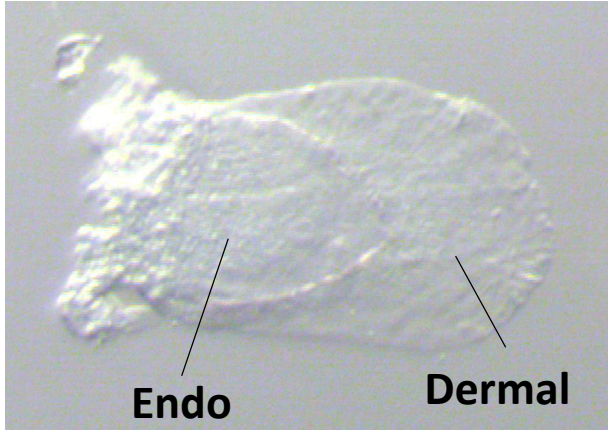
Skeletal shifts during the fish-to-tetrapod transition



Dermal

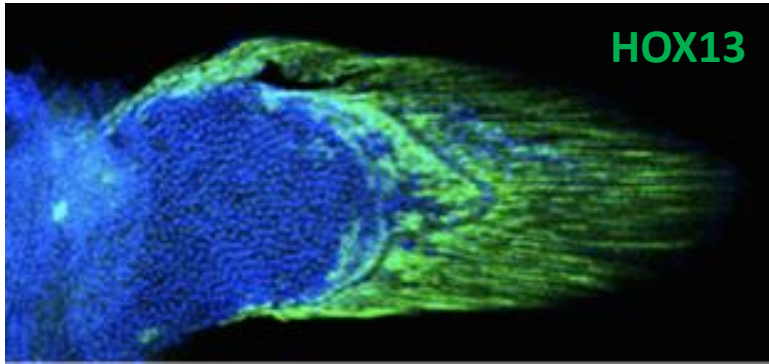


Endochondral

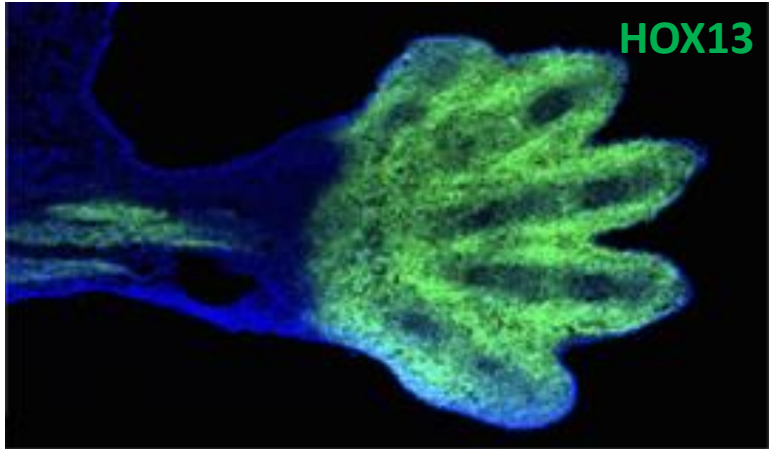


Endo

Dermal



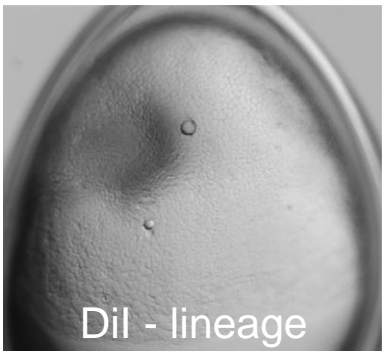
HOX13



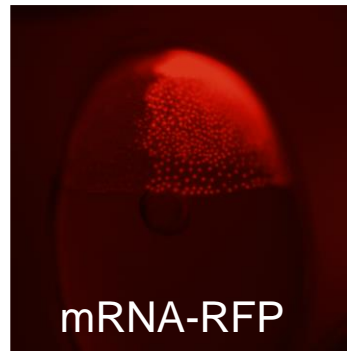
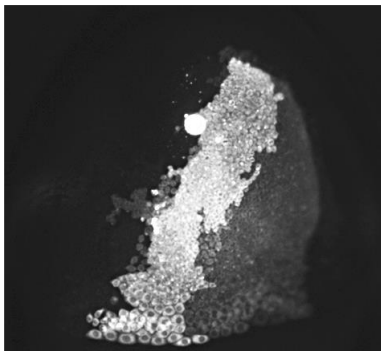
HOX13



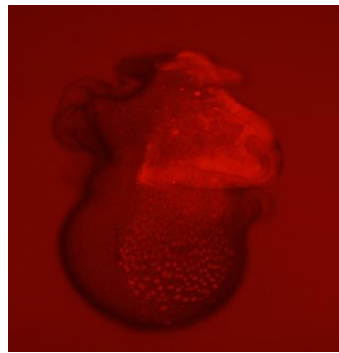
Tetsuya Nakamura
Rutgers University
Rowe 421,



Dil - lineage



mRNA-RFP

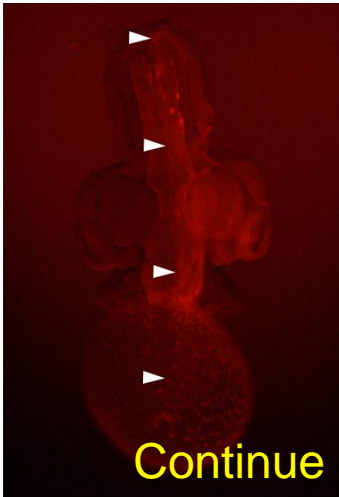
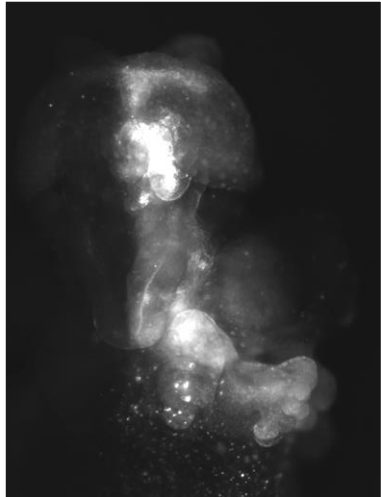


Doryteuthis
(*Loligo*)

Creating Transgenic Cephalopods



Karen Crawford - SMCM
Lillie 316, MRC 208, MC 36
kcrawford@smcm.edu

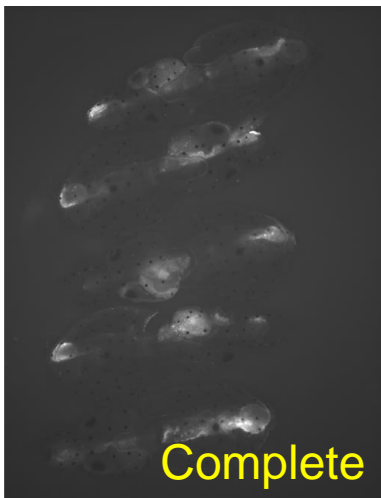


Continue



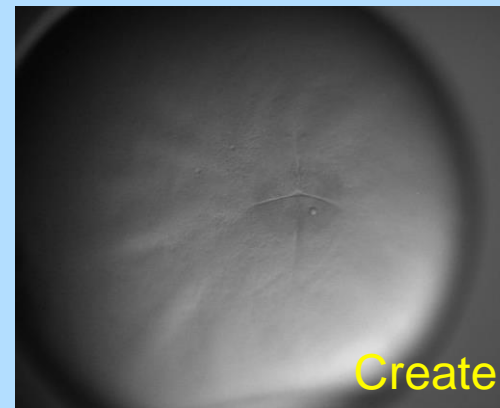
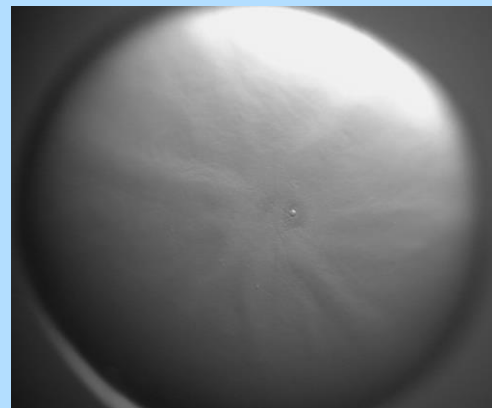
The Stars:
PJ &
Bobtail

in aquaculture ~
MRC (*Bret G. et al.*)

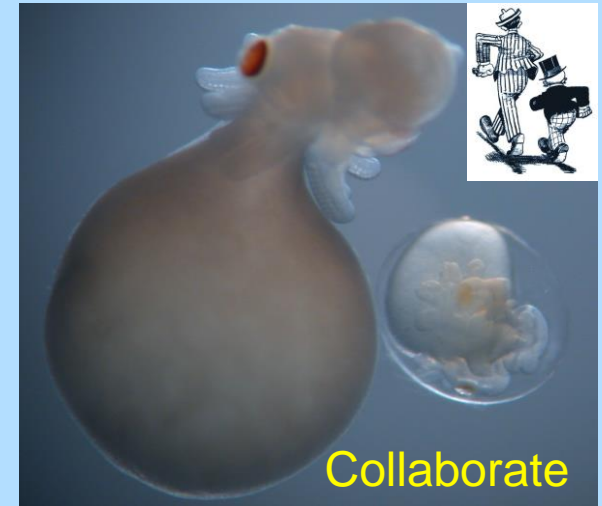


Complete

Transgenics-CRISPR/Cas9



Create



Collaborate

Multimodal sensory integration in toadfish



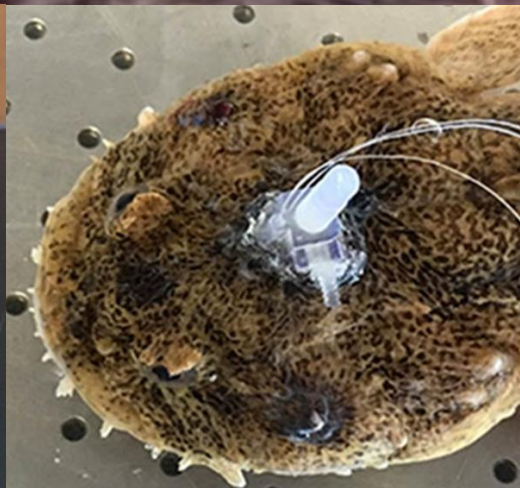
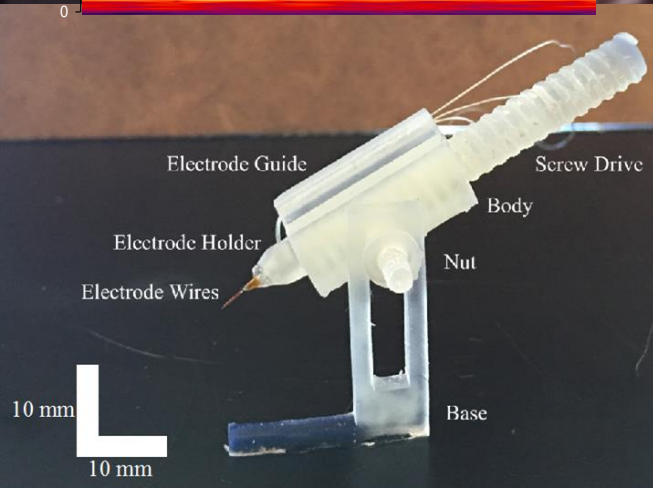
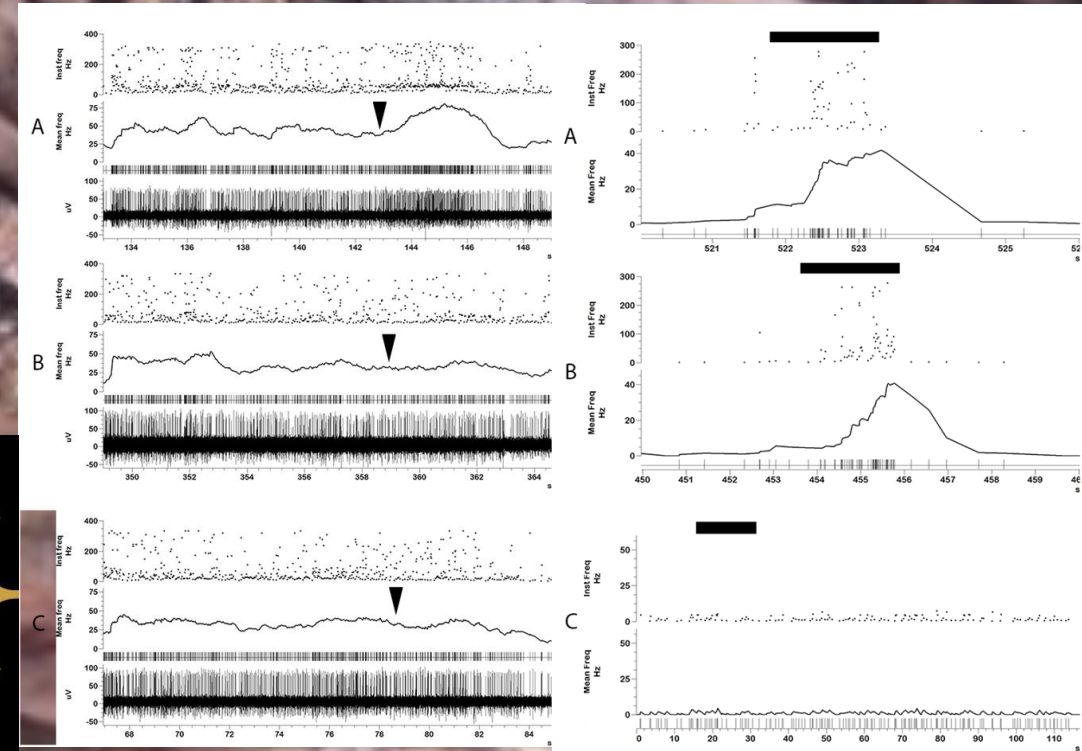
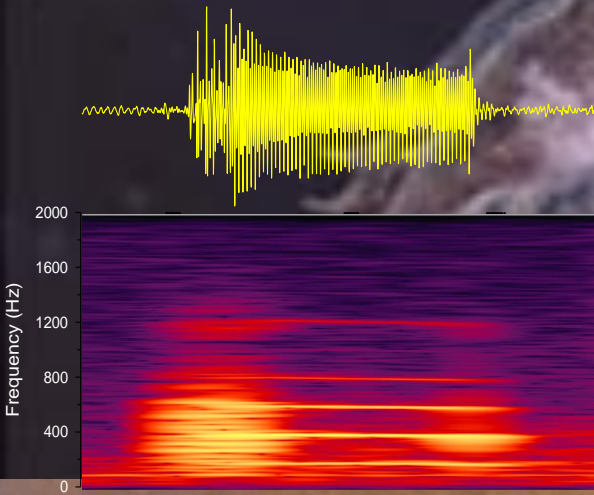
Allen F. Mensinger

University of Minnesota Duluth

MRC 306

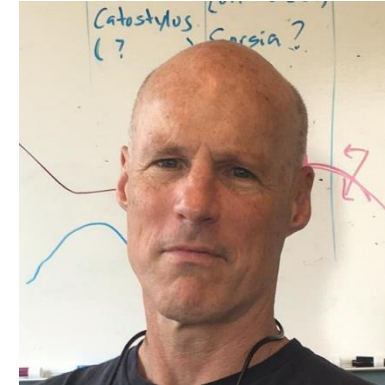
Co-director MBL-REU program

amensing@d.umn.edu



Animal-Fluid Interactions

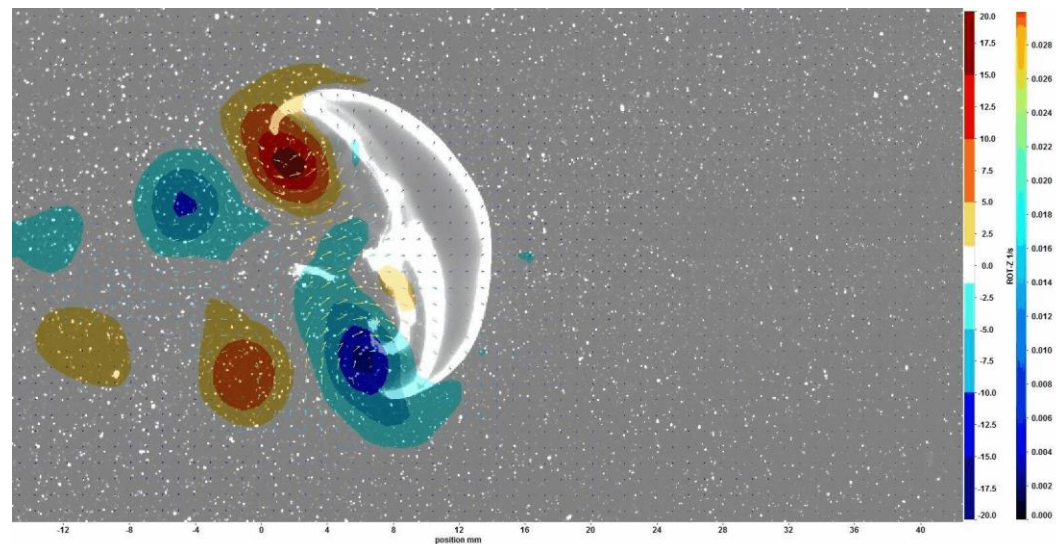
High speed imaging and fluid analysis



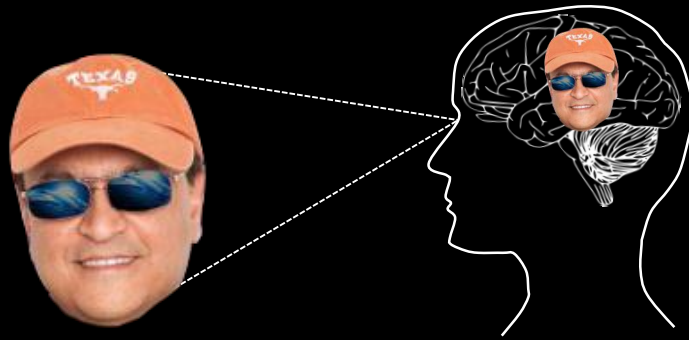
Jack Costello
Rowe 301

costello@providence.edu

Sean Colin
Eric Tytell

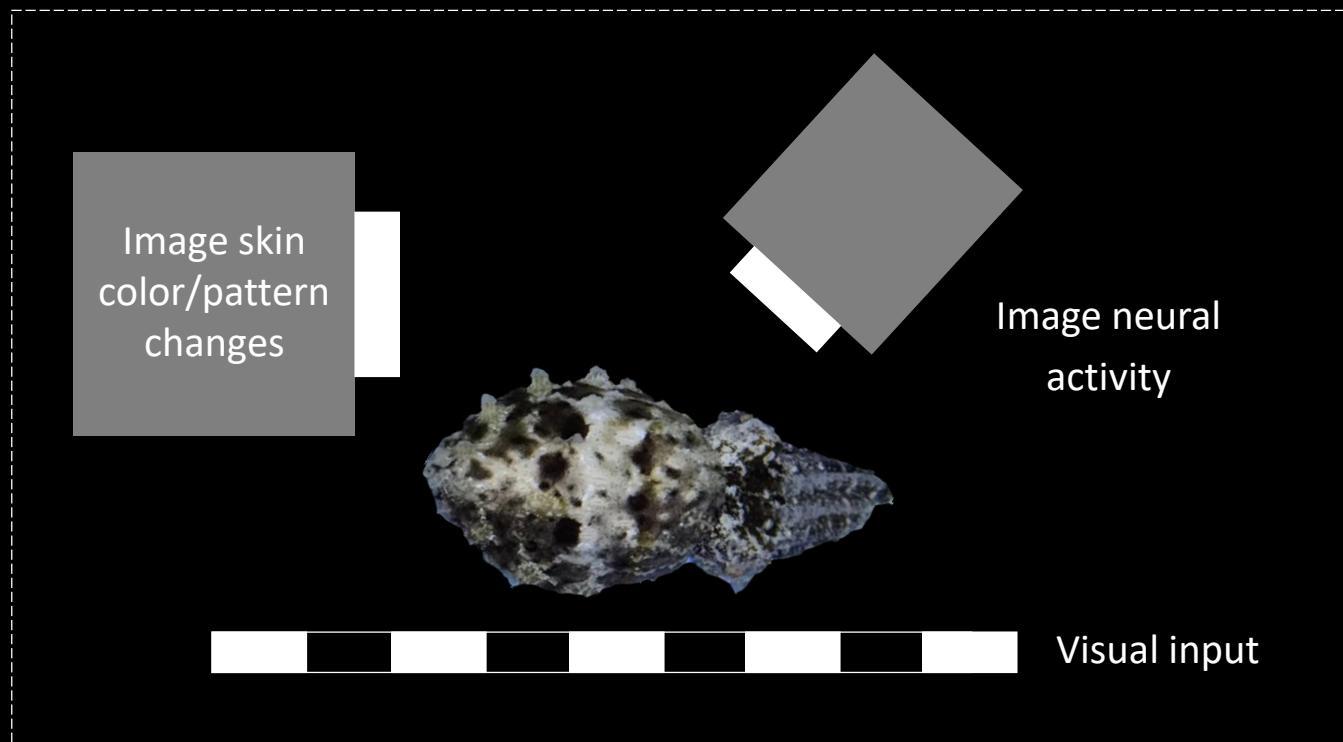


Neural basis of cuttlefish camouflage



Aim 1: Generate transgenic cuttlefish

Aim 2: Develop camouflage assay



Tessa Montague
Grass Fellow
tmontague@g.harvard.edu
MRC 208



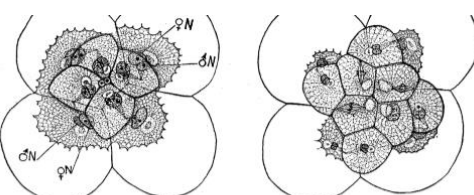


Fig. 11.—Telophase of Third Cleavage. Egg and sperm constituents of nuclei indicated; also bending of spindle axis and relation of centrosomes and nuclei.

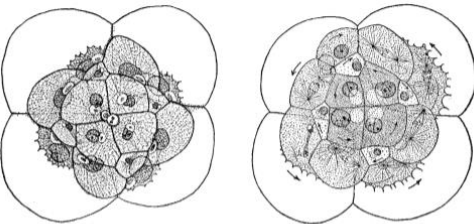


Fig. 12.—Telophase of Fourth Cleavage and Prophase of division of First Quartette cells. The nuclei in the telophase are dual, though from this stage on the egg and sperm constituents cannot be identified with certainty.

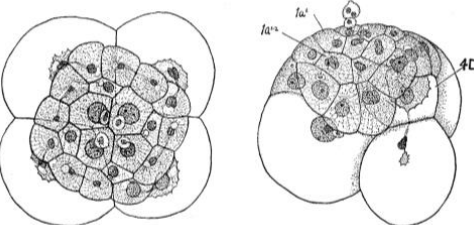
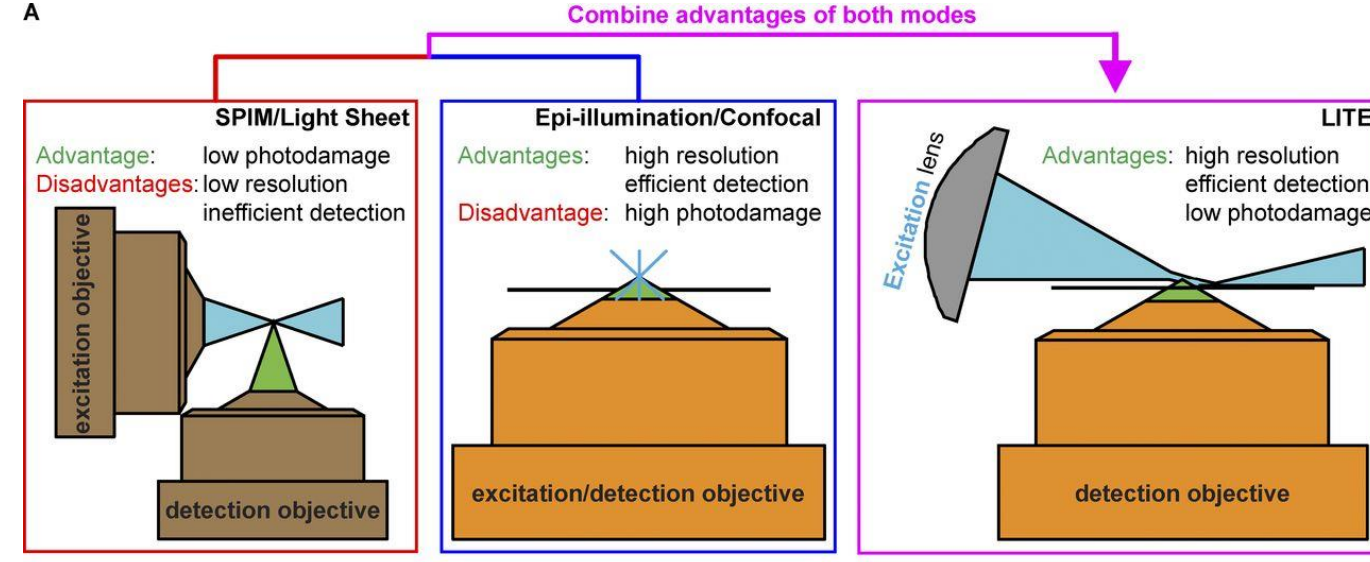
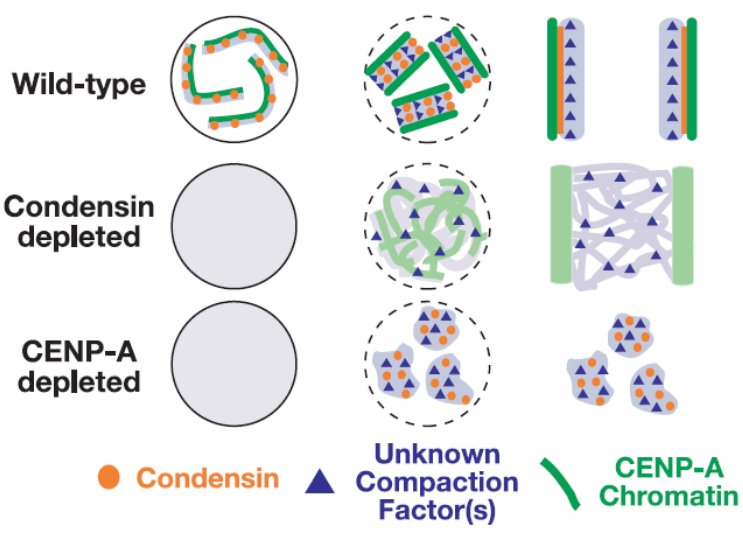
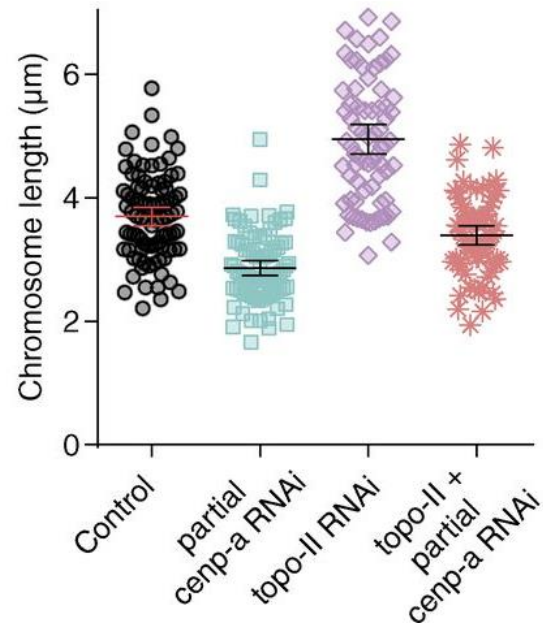
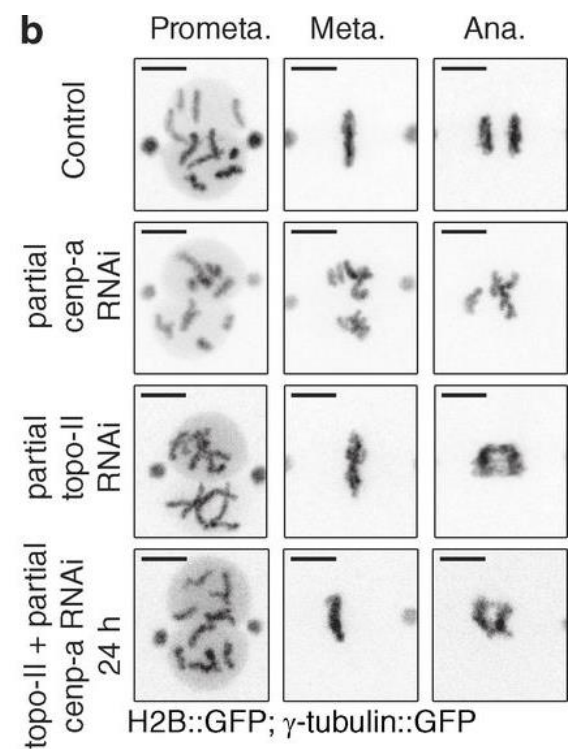


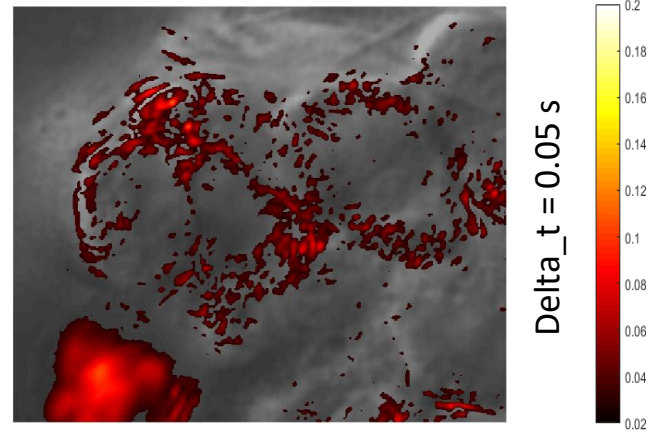
Fig. 13.—Telophase of Division of Second Quartette and formation of Third; dual nuclei shown in almost all of these cells.

Conklin, 1901

Mitotic Chromosome shape and size control



Microscopy and Analysis tools



Come find us in Embryology (Loeb262) or in Lillie 220 for imaging! Mizarimaging.com

Paul S. Maddox, UNC-CH Dept of Biology