PROJECT:
DISCOVER VOLVOX DEVELOPMENT

GOALS

- Learn about Volvox biology and its life cycle
- Learn about how studying Volvox contributes to understanding the evolution of multicellularity.
- Learn about mutagenesis and the importance of studying mutants in developmental biology.
- Examine Volvox colonies and identify mutants produced by UV mutagenesis.
- Document relationships between UV light doses and Volvox viability and rate of mutagenesis.
- Document mutants on Instagram and Google classroom.
- Send requested mutants back to Danforth Center for possible further study.

SCOPE AND DURATION OF THE PROJECT

~1-2 weeks:

- Hands on: 2-3 hours. Observing Volvox, selecting mutants, and isolating mutants as single clones
- Hands on: 2 hours. taking photomicrographs of mutants and uploading to the DVD Instagram account.
- Hands on: 1 hour. Pack and send unknown mutants to Danforth Center on request
- Hands off: waiting for isolated clones to grow up (~4 days-2 weeks depending on mutant and whether multiple rounds of mutant screening are done)

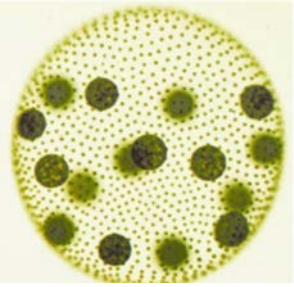
MATERIALS

Provided by the Danforth Center	**Provided by the Student**
On request. Box with prepaid mail label to send mutants back to the Danforth	Area by a well-lit window at room temperature, or a plant growth light shelf for maintaining cultures
Cultures of mutagenized Volvox to screen, and wild-type Volvox for reference	Smart phone with camera
Mini-microscope or dissecting scope	Internet
Multi-well plates for subcloning Volvox	
Petri dishes for observing and subcloning Volvox	
Plastic and glass Pasteur pipettes for transferring SVM and picking single Volvox colonies	
Racks for tubes	
Sharpie	
Sterile Standard Volvox Medium (SVM)	

THINGS TO DO

Check mark the tasks as you are done with them.

- ☐ Contact Sandra Arango-Caro (sarango-caro@danforthcenter.org) to coordinate the delivery of the materials and to have access to the project documents.
- ☐ Access your Google Classroom space using the link provided by e-mail.
- ☐ Read the assigned material first.
- ☐ Read, sign and return the photo release form and the acknowledgement of responsibilities form to Sandra Arango-Caro (sarango-caro@danforthcenter.org).
- ☐ Take detailed notes at each stage and upload to the Google Classroom folder along with your images.
- ☐ Observe Volvox colonies to identify mutants and compare viability/mutant yield among different UV doses. Mutant yield equals (number independent mutants/number of viable Volvox).
- ☐ Pick out mutants and subclone single colonies into multi-well plates for regrowth
- ☐ Observe subcloned colonies after re-growth to see if the observed phenotype was heritable among daughter colonies.
- ☐ Take photos and/or draw pictures of the mutants observed.
- ☐ Share photos and drawings to the DVD Instagram account (discover.volvox) and upload them into your Google Classroom account.
- ☐ Contact Danforth Center Scientists if you have found one or more candidate mutants. Send them to Danforth Center upon request.
- ☐ Provide a photo of yourself conducting this research project.
- ☐ Complete the survey about your research experience.



CONTACT INFORMATION

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READING AND RESOURCES

DVD Instagram Account discover.volvox

Google Classroom space for sharing materials (link provided by Danforth Center)

https://educate.today/edvideos/discover-volvox-development/
Videos describing Volvox and the DVD project. Downloadable worksheets and classroom guides.

https://www.nature.com/scitable/topicpage/volvox-chlamydomonas-and-the-evolution-of-multicellularity-14433403/#
A review aimed at college-level students about the origins of multicellularity and volvocine algae (including Volvox) as a model system.