

Mitochondria in motion: Beyond the powerhouse

Presented by:

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May 22, 2019 (8:30 am – 3:30 pm)

303 Main Building

Penn State - Brandywine

Mitochondria are membrane-bound organelles involved in many metabolic pathways. This workshop uses the research being done in the lab of Dr. Megan Povelones on the dynamic nature of the mitochondria as a way to teach students fundamental concepts of life science. Teachers will learn about ways in which mitochondrial structure is linked to function, particularly how the mitochondrion of single-celled parasites helps them to adapt to life in different hosts. Teachers will gain hands-on experience in techniques biologists use to investigate this phenomenon and other basic questions in cell biology. Teachers will be invited to take this project to their classrooms to engage students in authentic research. All teachers are welcome, but content is most applicable to biology and life science teachers, particularly those teaching about structure/function of cellular organelles, metabolism, natural selection and adaptations.

Target Audience: Teachers of students grades 6-12

This workshop is FREE to all educators with ACT 48 (6.5 hours) provided free of charge

This workshop is aligned to the PA Science and Technology standards, and Next Generation Science Standards.

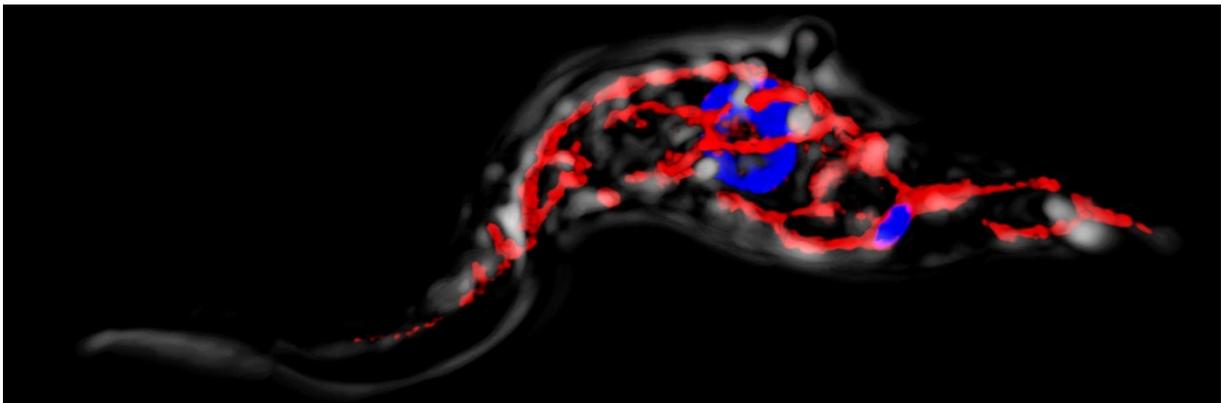
A continental breakfast and lunch are provided.

Maximum enrollment is 24. [Register online now](#) to reserve a spot online today.

For more information email Matt Johnson at mjohnson@psu.edu or call 814-863-6607.

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Pennsylvania Science, Technology, and Engineering Standards

Grades 6-12

- 3.1.B.A1: Compare and contrast the cellular structures and degrees of complexity of prokaryotic and eukaryotic organisms.
- 3.1.B.A2: Explain the important role of ATP in cell metabolism
- 3.1.B.A5: Relate the structure of cell organelles to their function
- 3.1.C.A1: Explain the chemistry of metabolism
- 3.1.5.A3: Compare and contrast similarities and differences in life cycles of different organisms
- 3.1.6.A6: Identify examples of unicellular and multicellular organisms
- 3.1.7.A1: Describe the similarities and differences of physical characteristics in diverse organisms
- 3.1.7.A2: Describe how organisms obtain and use energy throughout their lives
- 3.1.8.A8: Explain mechanisms organisms use to adapt to their environment

Next Generation Science Standards

Grades 6-8

Disciplinary core ideas:

- MS-LS1-2: Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell
- MS-LS1-7: Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials
- MS-LS4-6: Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.

Grades 9-12

Disciplinary core ideas:

- HS-LS-1-1: Systems of specialized cells within organisms help them perform the essential functions of life.
- HS-LS-1-3: Feedback mechanisms maintain a living systems' internal conditions within certain limits and mediate behaviors, allowing it to remain alive and function even as external conditions change within some range.
- HS-LS-1-7: Energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transfer energy to muscles.