i-STEAM with CSATS | PennState College of Education | CSATS Bridging Research & Education in STEM Center for Science and the Schools | PennState College of Medicine

i-STEAM The Molecular Mechanism of Diabetes Two-Day Workshop

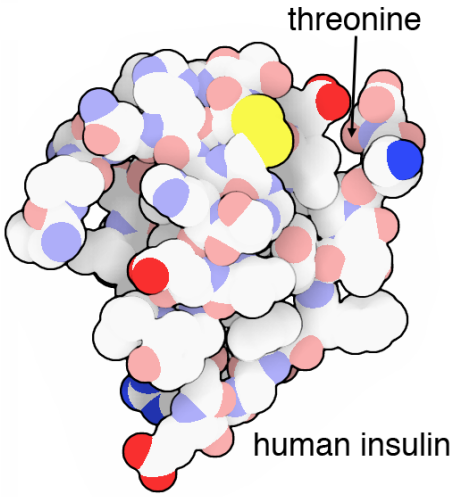


Photo from : https://pdb101.rcsb.org/motm/14

Presented by
Dr. Ira Ropson, Ph.D.
Assistant Dean of Medical Student Research;
Amber Cesare & Tiffany Lewis
Center for Science and the Schools

Two-Day Workshop
Thursday, November 14, 2019
AND
Saturday, November 16, 2019
9:00 a.m. – 3:30 p.m.

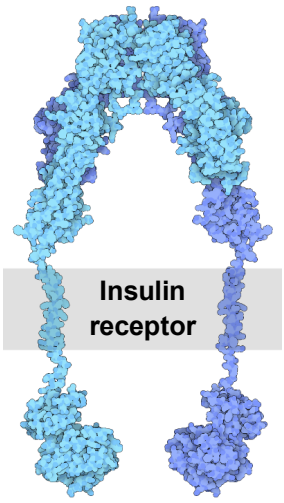
Penn State Hershey,
500 University Drive,
Hershey, PA 17033

Proteins are essential machines of the cell! Join us in a phenomenon-based unit to explore the molecular modeling of insulin and related proteins. In this two-day workshop, teachers will use the software Jmol to explore protein structure and function through digital modeling. Participants will create and 3D print a protein from the insulin story to take with them! The unit presented in this workshop could be used to review for the Keystone Biology exam by synthesizing the following topics: transcription, translation, protein folding, post-translational modification, cell transport, cell signaling, metabolic disease, and biological macromolecules.

Target audience: Secondary Life Science Teachers (7-12)

This workshop is **FREE** to all educators with ACT 48 credit available.

All i-STEAM Workshops are aligned to PA State Standards, Next Generation Science Standards and Common Core. A continental breakfast and lunch are provided by the Center for Science and the Schools (CSATS). Maximum enrollment is 24; please register online now to reserve a spot.



Sponsored by
The Penn State College of Education
Center for Science and the Schools
182 Chambers Building, University Park, PA 16802

To register visit: CSATS i-STEAM Workshops
For more information, email Amber Cesare at ams5306@psu.edu or call (814) 867-1323

Grade 10

Math Standards

CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
CC.2.3.HS.A.14 Apply geometric concepts to model and solve real world problems.

English Language Arts Standards

CC.3.5.9-10.G. Translate quantitative and technical information expressed in words in a text into visual form and translate information expressed visually or mathematically into words.
CC.3.5.9-10.J. By the end of grade 10, read and comprehend science/technical texts in the grades 9-10 text complexity band independently and proficiently.
CC.3.6.9-10.F. Conduct short as well as more sustained research projects to answer a question or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
CC.3.6.9-10.G. Gather relevant information from multiple authoritative prints and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research questions; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.
CC.3.6.9-10.H. Draw evidence from informational texts to support analysis, reflection, and research.

Science Technology and Engineering Standards

BIO.A.2.1.1 Describe how biological macromolecules form from monomers.
BIO.A.2.2.3 Compare the structure and function of carbohydrates, lipids, proteins and nucleic acids in organisms.
BIO.A.4.1.2 Compare the mechanisms that transport materials across the plasma membrane
BIOA.4.1.3 Describe how membrane-bound cellular organelles facilitate the transport of materials within a cell.
BIO.A.4.2.1 Explain how organisms maintain homeostasis.
BIO.B.2.2.2 Describe the role of ribosomes, endoplasmic reticulum, Golgi apparatus, and the nucleus in the production of specific types of proteins.
BIO.B.2.3.1 Describe how genetic mutations alter the DNA sequence and may or may not affect phenotype
BIO.B.2.4.1 Explain how genetic engineering has impacted the fields of medicine, forensics, and agriculture

NGSS Science and Engineering Practices

1. Asking question
2. Developing and using models
8. Obtaining, evaluating, and communicating information.