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The Biomedical Inquirer

Inquiry-based K-12 science education programs
from the University of Pittsburgh Department of Biological Sciences



Addition of Mobile Lab increases accessibility of Pitt Outreach science education to region

The Pitt Mobile Science Lab hit the road in January 2009 and welcomed 61 teachers and 1,641 students aboard to perform real science experiments in its first five months. September 26-27, 2009, marked a major milestone for Pitt's science education program: the mobile lab traveled over 100 miles to two schools near Erie, PA, where we worked with students and teachers who took part in summer workshops offered by the Department of Biological Sciences. This trip represents the first step in developing a regional, rather than local, science education effort. The Pittsburgh team is thrilled by the addition of the Mobile Lab because they can now work with schools that were previously beyond their reach. Contact Dr. Alison Slinsky Legg (see reverse) if your school is interested in a visit from the Mobile Lab.



The Mobile Lab is run as a partnership between Pitt's Dept. of Biological Sciences and Clinical and Translational Science Institute (CTSI). Community partners include the Pittsburgh Life Sciences Greenhouse, the Lyceum Group, Pittsburgh Tissue Engineering Initiative, and Thermo Fisher Scientific. The Biological Sciences Outreach Program receives support from the Howard Hughes Medical Institute and a Science Education Partnership Award from the National Center for Research Resources, a unit of the US National Institutes of Health. The vehicle was purchased through a Clinical and Translational Science Award from NCRR to Pitt's CTSI.

Outreach Director wins Educator Award

Congratulations to Dr. Alison Slinsky Legg, our Director of Outreach Programs, for being named a Carnegie Science University/Post-Secondary Educator of 2010!



Carnegie Science Center established the Carnegie Science Awards program in 1997 "to recognize and promote innovation in science and technology across western Pennsylvania" by honoring local educators and "saluting the tremendous work and vitality of this region". The award will be presented on May 7, 2010, at Carnegie Museums of Pittsburgh (www.carnegiesciencecenter.org).

Meet the Gene Team Coordinators

Gene Team is part of the Pitt Department of Biological Sciences Outreach Program that works with area high school teachers and students through a summer research program and implementation of inquiry-based science education modules in classrooms during the academic year. The activities of the Gene Team are carried out by the Gene Team Coordinators.

Brian DiRienzo

As Gene Team Coordinator, Brian travels to Pittsburgh-area high schools teaching inquiry-based modules during the academic year and helps to run a 7-week summer research program during which high school teachers and students carry out current research projects on health-related issues. Brian also takes part in various other activities such as PJAS workshops, DNA Day, SciTech and also teaches on the Mobile Science Lab.



Brian joined the Gene Team in 2006 after graduating from the University of Pittsburgh with a BS in Biological Sciences. Brian grew up in Philadelphia and always felt that the most interesting subject in school was biology. Brian enjoys being in the classroom and getting kids interested in biology. He enjoys when students ask questions because they are thinking and engaged in the subject matter.

Marcie Warner

Marcie recently joined the Gene Team in November 2009. The addition of a second Gene Team Coordinator doubles the capacity of the Outreach program to provide inquiry-based modules to area high schools. Marcie will focus on expanding the use of the Mobile Science Lab during high school visits.



Marcie is a native of the Pittsburgh area and a graduate of Shaler Area High School. After completing her BS in Biological Sciences from Duquesne University in 2000, she worked in research labs that studied development of autoimmune and kidney diseases. Marcie enrolled in the Ph.D. program in Pitt's Department of Biological Sciences in 2002 and completed her degree in 2008. Marcie's graduate studies focused on understanding the processes that control the structure of chromatin, which is a protein-DNA material that permits large DNA molecules to fit within the comparatively small cell nucleus.

Gene Team 2009 made contributions to health-related research at the University of Pittsburgh

From June 22nd to August 7th 2009, 5 high school biology teachers and 10 high school students participated in the Gene Team 7-week summer research program. This year's Gene Team tackled two cutting-edge research projects that used genetics to study health-related problems: one project used worms as the system of study and the other used yeast.



A project from the laboratory of Lew Jacobson involved use of the worm *C. elegans* to perform an RNA interference screen of 65 genes encoding protein phosphatases; Gene Team aimed to identify two classes of genes: (a) those whose knockdown caused abnormal degradation of muscle protein in normal worms; and (b) those whose knockdown prevented protein degradation in worms that were genetically predisposed to excessive muscle degradation. Gene Team identified candidate genes in both categories and these are now being studied in the Jacobson lab.

A project from the laboratory of Joe Martens utilized yeast to study how transcription along non-coding, intergenic DNA can regulate expression of a neighboring gene; Gene Team studied the role of a particular transcription factor, Spt16, in this process by creating many yeast strains with mutations in the *SPT16* gene. Gene Team began characterizing these mutations and this work is being continued in the Martens lab.

Outreach program teams with WQED to create science program for middle school students

Pitt's Department of Biological Sciences collaborated with WQED to design a television show aimed at making science and current research appealing to a middle school audience. The show, called Science Mission 101, is based on the department's existing Outreach programs and features



members of the department as well as high school students who have participated in the Gene Team program. The show was filmed in Langley and Clapp Halls and on the University's Mobile Science Lab.

In the show, teams of students must execute and interpret a competition experiment that uses bacteria and amoebae to investigate principles of natural selection. The experiment is based on research from the laboratory of Jeffrey Lawrence. More information about Science Mission 101 can be found at www.wqed.org/tv/sciencemission101.

First year graduate student began research career through PHIRE program

Andrew (Drew) Hryckowian got an early start as a research scientist. As a sophomore at Greater Latrobe High School, he joined the Phage Hunters Integrating Science and Education (PHIRE) program at Pitt (sponsored by the Howard Hughes Medical Institute). The PHIRE program incorporates a parallel project and peer-mentoring structure to introduce students to an authentic research experience. Undergraduate and high school students engage in bacteriophage discovery and take advantage of the immense diversity of the virus population to find new virus types. High school students are engaged either through summer fellowships or in an after-school program. Further information can be found at www.phagehunters.com.



Drew discovered several novel viruses that infect mycobacteria – one of which he called Mycobacteriophage CATERA – and he sequenced its genome to discover its many new genes. Drew attended Pitt as an undergraduate and continued his research by identifying phage cytotoxic genes that might lead to new therapeutic strategies for tuberculosis. Drew graduated in April '09 with a BS in microbiology, and co-authored two peer-reviewed publications on phage genomics. He is presently a first year graduate student at the University of Wisconsin at Madison where he is studying uropathogenic *Escherichia coli* (UPEC) – the primary cause of community-acquired urinary tract infections – in the laboratory of Dr. Rodney Welch.

Upcoming events

Gene Team 2010 summer research
University of Pittsburgh
June 21 – August 4

Summer 2010 Teacher Workshops:

Evolution
Pymatuning Laboratory of Ecology
July 11 - 17

Macromolecules
Allegheny College
July 12 – 18

Experimental Design
Pymatuning Laboratory of Ecology
July 18 - 24

Mobile Science Lab
Allegheny Intermediate Unit 1
July 6 - 9

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