The Summer Biology Experience (SBE) is a series of hands-on activities integrated with multiple threads of STEM concepts to develop a firm foundation for designing and executing experiments. Participants use these skills in the preCollege Research Opportunities (PRO) program and have the opportunity to compete for significant awards.

**Chemistry Concepts & Basic Laboratory Skills**

Students are taught basic concepts and lab skills; molarity, making solutions, pH, pKa, buffer systems and ionization of functional groups. Use of balances, spectrophotometers and pH meters. All students make solutions from scratch.

\[ A = - \log \left( \frac{\%T}{100} \right) \]

**Beer’s Law**

**Molecular Modeling & Spatial Ability**

Students learn the molecular structures by building models. Students learn PyMol™ and Photoshop™ to visualize and enhance protein structures from real coordinates.

**Communications: Writing and Visualization**

Students compose a paper and poster on the structure and function of a protein and illustrate with origin graphics.

**Computational & Critical Thinking Skills**

Software and challenge problems are used to encourage problem solving strategies.

**Eligibility:** Students from 6th to 12th grade are selected based on their interest in research, teacher recommendations and a face to face interview. Program costs may be covered by grants and donations. Room and board students are chaperoned and stay on campus. Parental approval is required for all students. Contact Director at Purdue.

http://www.bio.purdue.edu/outreach
Congratulations!
Indiana Teachers and Top Winning Students

Special Congratulations Arjun Ramani,
Top 40 STS Finalist, Regeneron Science Talent Search
“Fast Sampling of Stochastic Kronecker Graphs
by Identifying Erdos-Renyi Subregions”
Teachers, West Lafayette Junior-Senior High School &
David Gleich, Computer Science, Purdue University

International Science & Engineering Fair
Top Row: Arjyn Ramani (2nd Place Mathematics), Bowen Jing,
Sepehr Asgari (3rd Place Microbiology) & Taj El-Khalili
Front Row: Lucy Smith, Jenny Wang (4th Place Earth &
Environmental Sciences), Annie Ostojic, & Jooyoung Rosa Lee

Arjyn Ramani, Bowen Jing, Jenny Wang & Rosa Lee
Teachers West Lafayette Junior-Senior High School
Jenny Wang - Sultan Zheng, Philip Low Purdue University,
Taj El-Khalili, Teacher Lynn Sneider, Harrison High School,
Sepehr Asgari, Teacher Jacob Fitzgerald, Carmel HS,
Annie Ostojic, Munster HS.

preCollege Research Opportunities

Students interested in gaining research experience can participate in the preCollege Research Opportunities
program (PRO) at Purdue University. Students have the opportunity to independently select, design, and execute
their own set of experiments in a special laboratory in the Department of Biological Sciences. A BSL2
lab (Biosafety Level 2 Lab) in this facility allows the opportunity to culture microorganisms and cell lines un-
available in high school labs. Students use state-of-the-art molecular biology techniques. Experiments do
not have to be biological in nature, nor is competing in the Science Fair a requirement. Most students design
their experiments to compete in their local Science and Engineering Fair, and have the opportunity to com-
pete for awards. Previous PRO participants have a significant record of success.

Students are selected by demonstrating interest and/or prior participation in the SBE. Parental approval is
required. All research requires the Director’s approval and in some cases the approval of Purdue University.
This program operates year-round on weekends, after school, during holidays/breaks and the summer.

Contact Dr. Clark Gedney, Director, in the Department of Biological Sciences at Purdue University, cged-
ney@purdue.edu or text 765-404-0425.