Introducing Medicinal Chemistry Research to Middle School Students: A Multi-Faceted Approach from a GK-12 Experience

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Reach for the Stars: an NSF GK-12 Program

Nettelhorst Field Trip to Silverman Hall

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After several months of working with a GK-12 fellow in their science class, chemistry research:

1. Goals:
   - encourage a culture of science
   - introduce students to simulation of complex systems
   - gain understanding of complex structures of biomolecules and how scientists work to understand them

2. Additional Activities:
   - visit from Prof. Richard B. Silverman (creator of Lyrica, Kristin’s PhD advisor)
   - tour of lab workspace
   - tour of Kristin’s lab
   - lunch in a college classroom

Five Activity Stations, 20 minutes each:
- 1. CAMI 3-D Biomolecular Visualization Wall
- 2. Cancer Cell Culture and Micropipetting Practice
- 3. Computational Medicinal Chemistry and Drug Design
- 4. Chemical Reaction Demonstrations
- 5. Chromatography

Other favorite aspects of the field trip (number of student responses):
- meeting scientists (2)
- everything/could not decide (2)
- meeting Prof. Silverman (4)
- relating science to everyday life (2)

Additional comments from students:
- “My favorite part was participating in stuff.”
- “My favorite part was the laboratory…the lab coats and glasses made it all look really real.”
- “I have to say I hated science because I like to sit.”

Advice for Hosting a Student Visit

Organization:
- plan ahead to schedule facility visits, photographers, etc.
- consider time and number of students (2 days, 50 students each; 25-20 minute stations)
- delegate tasks to volunteers and school staff
- be aware of safety considerations and release forms
- make a Master Plan and a detailed “day-of Timeline” to share with everyone involved
- at each station have a clock clearly visible and the schedule posted
- notify EVERYONE in the building of a student visit
- encourage a reflection activity the next day to maximize impact and gain feedback

Adapting Your Research Work:
- consider the big picture of your research
- simplify, simplify, simplify concepts of your research
- make posters to provide additional information about the science behind activities
- take advantage of exciting research facilities on your campus
- get the students involved in safe lab activities and provide “souvenirs”
- take photos of the day and showcase the event in a department/campus newsletter

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