# Tips for Mentoring a Summer Student

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How many of you did a summer research project before grad school or before college?

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## Why Take a Student?

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## Why Take a Student?

- Pushes you to understand your project on a new level
- Learn how to design a project
- Learn to evaluate skill levels
- Develop mentoring/teaching/management skills – important in ANY field
- Earn CV bullets – transferable skills

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## Our Summer Goals for the Students

- Instill a LOVE of science
- Help your intern understand
  - Research life
  - How science actually works
- Help him/her develop technical and professional skills

## What Gains Do Students Actually Report?

- Increased confidence in their ability to do science
- Establishing working relationships with mentors and peers
- Learning to "think like a scientist"
- Increased facility with techniques
- Improved ability to communicate science
- Increased clarity about and preparation for careers
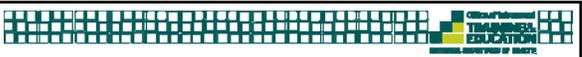
## What to Expect?

- Enthusiasm: they expect to cure cancer
- Questions, questions and more questions
  - Real stumper questions
  - Stuff you take for granted
- Mistakes

## What Not to Expect

- Your work done in half the time
- Speed
- Prior knowledge
- Skills

## Planning for Success

- Decide on a research project
- Prepare ahead of time.
  - Summarize the research project.
  - Decide which protocols your student should master, papers he/she should read, etc.
  - Order reagents.
- Communicate with the intern in advance.
- Plan for your summer schedule.

## Elements of a Good Research Project

- Reasonable scope
- Feasibility
- Likelihood of generating data that the student can present
- Real (not "cookbook") experiments
- Possible challenges
- Multiple approaches/techniques

## Types of Projects

- Cloning
- Sequence analysis
- Enzyme kinetics
- Protein expression/purification
- Technique optimization
- Analysis of a particular subset of epidemiological data
- Use of imaging processing algorithms to compare fMRI scans

## Skills They Need to Learn

- Technical Skills
- Keeping a lab/research notebook
- Internet skills
- Critical thinking
- Patience/persistence
- Strategies for dealing with success and failure
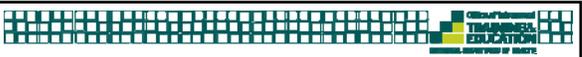
## Establishing a Good Relationship

- Make direct eye contact
- Be enthusiastic
- Introduce them to the lab and lab members
- Acquaint them with the building
- Get them started with their lab notebook
- Talk about the "big picture"
- Discuss lab policies
- Discuss the mentee's background
- Get to know your mentee – why is he/she here?

## Communicating the Project

- Clear vision: what might the finished product look like?
- Big vs. small picture
- Expectations
- Future applications of the project results

## Do They Really Understand?

- Ask your intern to
  - Explain the project back to you.
  - Explain the project to a peer/another group member
  - Draw a flowchart or diagram of the project.
- Develop worksheets to assess understanding – of experiments OR papers
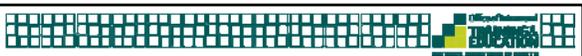
## Timeline

- Week 1: Skills and background
- Week 2: Project specific techniques/background
- Week 4: Mid-term regroup
- Week 7: Finalizing project: Poster design
- Week 8: Adios and keep in touch

## The Mid-term Regroup

- Reaffirm expectations
- Assess progress
- Alter plan as necessary
- Strategize

## Dealing with a Novice

- Hazardous materials/animal work
- Do the right thing (i.e., no shortcuts)
- Forgiveness
- Flexibility
- Inclusion (seminars, lab meetings, lunch)
- Talk about their success to everyone
- Welcome their questions
- Watch/try more advanced techniques
- Grow their skills
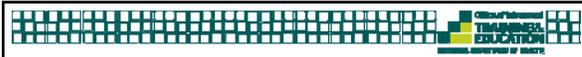
## Managing YOUR Time

- Dedicate time for your intern: plan to spend at least an hour a day
- Define boundaries
- Protect your own lab time
- Provide guidance on what to do with "down time"

## What Gains do Mentors Report?

- Boost to the CV (6/8)
- Increased research productivity/quality (5/8)
- Enjoyment, personal satisfaction
- Enhanced confidence an/or self-awareness
- Improved interpersonal skills (teaching/mentoring/communicating)
- Increased understanding of the faculty role
- Deeper understanding of their own work (7/8)

## Reported Challenges

- Difficulty gauging students prior knowledge
- Difficulty explaining concepts/techniques
- Frustration with student's lack of ability
- Difficulty relying on student's results (trust)
- Demands on mentor time
- Co-mentoring issues

## Giving Feedback

- Give feedback frequently
- Make feedback timely (don't wait too long)
- Keep feedback simple
- Provide a private, neutral setting
- Focus on the situation you observed
- Don't interpret motives (focus on the behavior)
- Communicate the impact of the behavior
- Offer suggestions and support
- Catch people "doing things right"

## Feedback: Things to Avoid

- Judgmental statements
- Using phrases like "always" & "never"
- Vague phrases that don't focus on a specific behavior
- Exaggerated statements about the behavior's impact
- Interpreting the behavior
- Exploring reasons for the behavior

## Feedback: Things to Avoid II

- Speaking for others
- Good-bad-good sandwiches
- Going on for too long
- Implied threats
- Using sarcastic humor in place of feedback
- Phrasing feedback as a question, not a statement

## Other Program Components

- Orientations
- Lab safety, animal handling courses
- Summer journal clubs
- Lecture series
- Workshops
- Brown bags
- Graduate & Professional School Fair
- Summer Poster Day

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- Clear expectations
- Good relationship
- Defined project
- Communication

All lead to summer success!

## Resources

- Online resources from the OITE
  - Webinar: *Keeping a Lab Notebook*
  - *Guidelines for Writing Professional E-mail*
  - Webinars: *Lab Math* (under development)
- Science Skills Summer Boot Camp
- The OITE Web page for summer interns: https://www.training.nih.gov/trainees/summer_interns
  - The Summer Handbook
  - Summer program coordinators
- Pre-professional/pre-graduate advisor: Bill Higgins, PhD

## Reference

- Dolan, E., and Johnson, D. (2009) *J. Sci. Educ. Technol.* **18**:487-500. Toward a Holistic View of Undergraduate Research Experiences: An Exploratory Study of Impact on Graduate/Postdoctoral Mentors.

## Mentoring Workshop

- Every Wednesday, June 1 through July 20, 4:00 to 5:00
- Led by Lori Conlan and OITE staff
- Aims to help mentors
  - Deal proactively with problems that arise
  - Increase their mentoring effectiveness and confidence
  - Help their interns to build confidence, independence, creativity, and communication skills
  - Improve cultural competence
  - Develop a mentoring philosophy
- Follows the "Entering Mentoring" Curriculum: http://www.hhmi.org/resources/labmanagement/downloads/entering_mentoring.pdf