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ADVANCE at Northeastern

Future Faculty Workshop

Establishing a Research Program and Managing the Graduate Students

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This presentation is adapted from NSF ADVANCE Rice University

General Thoughts

- The goal of your research program is to accomplish your career dream, to gain tenure and to establish a strong reputation
  - Do the things that support this goal
  - Do NOT do things that interfere with this goal
- How you set up your research group will follow you and will help determine your success
- Worry about results, funding and people!

Research Group Elements

- People
  - Undergraduates
  - Graduate students
  - Postdocs
  - Technical support staff
- Space
  - Place for people, equipment, materials and supplies

Motivating Your Group

- Find students who will work hard
- Find ways to avoid or dismiss students who will not work hard or are disruptive or dishonest
- Support your students and ensure their own learning process
  - Provide guidance and clear expectations
  - Provide feedback on their work
- Aim for diversity

People

- Technical staff
  - – Have clear job description
  - – Ask a colleague to help in interviews
  - – Are technical staff the best use of resources?
- Postdocs
  - – Does department have prejudice for/against postdocs? Favor graduate students?
  - – How difficult is it to recruit postdocs?
  - – Are there university resources for postdocs?
    - International issues?
    - Help with fellowship applications

People

- Graduate Students
  - What are departmental expectations for number of graduate students per year?
  - Will the graduate students also be expected to be TAs?
  - What are the processes for evaluation and advancement to candidacy for graduate students?

People

- Undergraduate research students
  - How many can you reasonably manage?
  - What are the departmental expectations for undergraduate research mentoring?
  - How do you strike the balance?
  - Using graduate students/postdocs as in-lab mentors for undergraduates can be a very successful strategy

Keeping Up

- Have “regular” meetings with each member of your laboratory
  - Be aware of what they are doing
  - If they need assistance, figure out the best way to guide them forward
- Have lab members write regular reports that can form the basis for publications
  - Use an outline to plan publication
  - Sketch figures/tables
  - Easy way to see what they are thinking and provide feedback

Personnel Management

- Establish a positive “lab culture”
- Have regular lab meetings to discuss research and look at papers in your area
- Be proactive in addressing personnel conflicts (or potential conflicts)
  - Get help if you need it
  - No one wants a caustic/poisonous lab environment
- Lead by example
  - Do you want an “Open Door”?

Lab Meetings

- Many different styles
  - Journal club
  - Present data
  - Rotating schedule or everyone each time
  - Don’t just organize it like your mentor did
- Get suggestions from colleagues
- Don’t be afraid to change format, time

Sub-Group Meetings

- Consider “regular” meetings for lab members working on similar research
    - Consolidate protocols, code, etc.
    - Share best practices and new information
    - May not need to be as frequent as full group meeting

Create Clear Expectations

- Consider drafting an agreement that outlines your expectations that you review with students and that they sign
  - Include information on backups for data/computers, books, chemicals, code/software, coursework, FAX/phone use, funding, human or animal subjects (and compliance training), lab duties, lab safety issues and safety officer, new member orientation, use of equipment, website

Create Clear Expectations

- Provide clear guidance on
  - Lab notebooks
  - Literature coverage (shared in lab meetings)
  - Attendance at meetings
  - General comportment
  - Publications
    - Order of authors/responsibilities/writing roles
  - Engagement in manuscript review/grant review

Create Clear Expectations

- Safety issues and procedures
- Security of the lab and its people
- Software and data backup policies
- Travel expectations
  - How often/who will fund/who must present
- Vacations
- Progress reports
- Work hours

Developing Expertise

- You'll want your lab members to learn
  - Basic lab skills
  - Advanced experimental procedures
  - Experimental design
  - Formulating hypotheses
- Plan for hierarchy of training
  - Rotate basic lab duties
  - Assign equipment to individuals
  - Refresher training to prevent protocol drift

Recruiting Graduate Students

- Volunteer to serve on the admissions committee
- Teach classes geared for graduate students
- Mentor graduate students as they enter the department
- Get a nice web site and keep it updated

Selecting Graduate Students

- Speak with those interested in your group, by phone or in person!
- Ask the candidates to do something meaningful for the lab: report, presentation
- Have them interact with your current students
- Weigh the risks – no one is perfect
- Follow up with candidate
- Remember they are also evaluating you

Undergraduate Students

- You may be swamped with requests for research experiences
- Don’t say yes to everyone that asks
  - Ask for references and check them!
  - Interview the student to check suitability
    - What are their skills/your needs?
  - Don’t swamp your graduate students and postdocs with mentees

Work Study Students?

- Seriously consider hiring work study students to help with routine lab duties
    - Helps maintain order, general cleanliness
    - You pay a fraction of their wages, if at all
    - Interview a few, hire the most convenient one – don't overthink the hire
    - May turn into a fabulous research intern!

Practice Saying "NO"

- Generate some boilerplate for polite rejections
  - "No" vs. "Not now"
  - "Your CV is interesting, but…"
  - "Here's how potential graduate students apply to our program…"
  - Create versions for undergrads, grads, and postdocs
  - Use for email replies or post on your website

Non-experimental Space

- Be sure that your office is placed in the relationship you desire with respect to your group members
  - Some like it close
  - Some like it far away

- Arrange your office to support your style of working

Physical Space

- Moving into existing space
    - Proximity to colleagues
    - Access to department/university equipment
    - Proper utilities for equipment
        - Electrical, air, vacuum, water
    - Hoods
        - Chemical, tissue culture
    - Air handling
        - Vibration issues, flow issues, etc.
    - Office space for students/postdocs
        - Separate or within lab?

Physical Space

- Renovating space
  - – Negotiate for a tenure clock extension, if your delay is >4-6 months
  - – Some issues apply as for existing space, but you have some choices!
  - – Think carefully about what you need for your work
    - Electrical, clean power, ventilation, hoods, plumbing, chilled water, vibration insulation, air flow from the HVAC system
  - – Do careful research about what you need
    - Contact vendors for equipment specifications and problems identified at other institutions
    - Ask colleagues about problems encountered at your institution

Physical Space

- Renovating space
  - – Learn from others about renovations
  - – Work with the architects/contractor to get your project within the assigned cost range
  - – Be **actively** involved in every state of the process – follow process regularly
  - – Ensure that what you need is being taken into account, especially completion date
  - – Be **prepared for delays**
    - Write grants or papers, prepare for teaching, write compliance documents

Physical Space

- Organize how you will move in
- Think about what you will do and in what order
- Ask for space to work temporarily if there are things that can get you going
- Take the time to engage your colleagues and learn more about the department

Equipment

- See possible discounts
- Negotiate with multiple vendors for the best price
- Allow sufficient lead time for items that are complex (1-6 months for large equipment)

Supplies

- Talk with multiple vendors (build discounts from some with large orders)
- Package as much as possible with each individual vendor for best price
- Consider larger quantities of items that "keep" and that you know you will need
  - Biggest discount you'll ever get!
  - Think about storage strategies

Resources

- Books:
  - “At the Helm” Kathy Barker
  - “Making the Right Moves” BWF and HHMI (free on-line)
  - “Lab Dynamics” Cohen and Cohen
  - “Tomorrow’s Professor” Richard Reis and TP listserv
    - (listserv archive available on the web)
  - “Academic Scientists at Work” Boss and Eckert
  - “Career Advice for Life Scientists” Women in Cell Biology
    - (free on-line)
  - “Getting Things Done” David Allen
  - “Whistling Vivaldi” Claude Steele

- Website: Science’s NextWave http://sciencecareers.sciencemag.org/