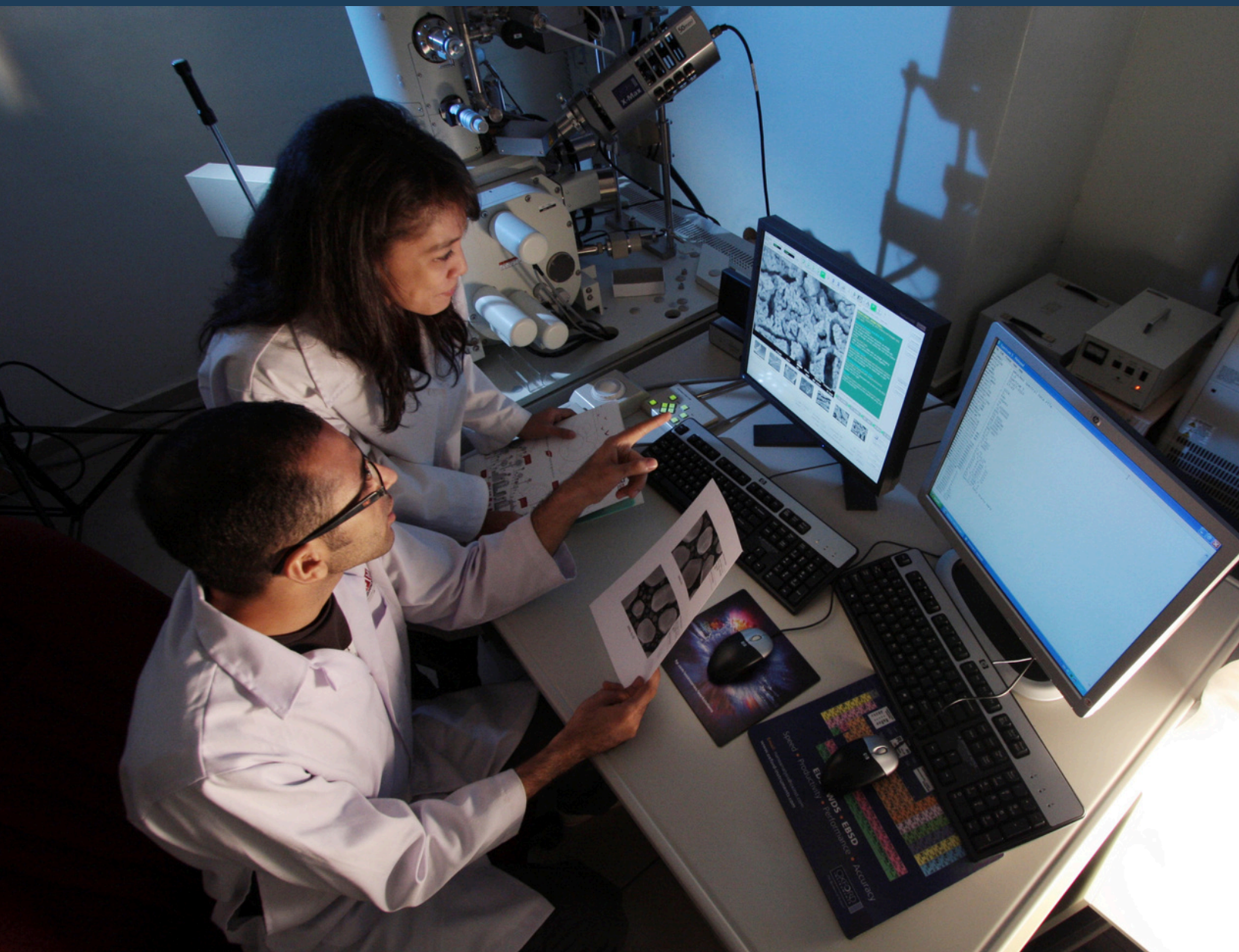


CONNECTING STUDENTS, ADVISORS, AND RESEARCH GROUPS

A RESOURCE GUIDE FOR STUDENTS & DEPARTMENTS



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INTRODUCTION

Research has shown that connecting with a supportive research group is one of the most important ways that STEM departments can support doctoral students' persistence and overall satisfaction in their degree programs. Although most STEM PhD programs have highly structured sequences of coursework during the first two years, the amount of structure programs provide for students to find research groups varies across STEM disciplines.

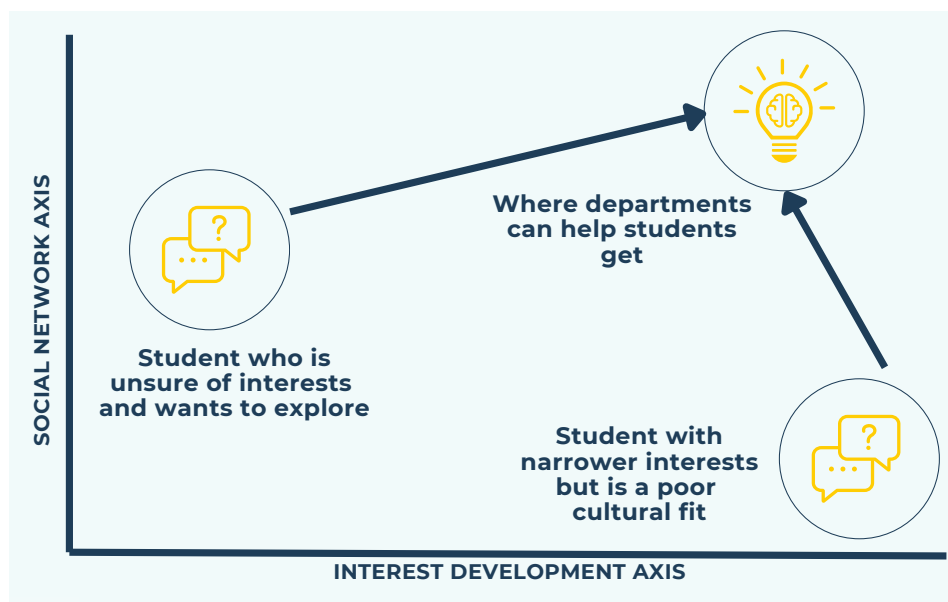


Helping students find a research group is an individualized process. Some students may enter graduate school unsure of what research to pursue, and hope to explore their interests during the first year. They may not know how to approach the task of finding a research group, or what makes a good advisor-advisee relationship. Without structured support from their graduate programs, they may be overwhelmed with navigating the process of finding a research group – and may consider leaving their programs if they feel they are too “behind” in doing so.

Other students enter their graduate programs with narrowly tailored research interests and an advisor already in mind. They may quickly select a research group and advisor without considering compatibility beyond research interests. Upon discovering incompatibilities, they may feel locked into their initial choice, prompting them to consider leaving their program.

In both cases, students may struggle to find a compatible research group without adequate support from their department. **To engage STEM graduate students early and actively toward connecting with a research group, departments should build or enhance structures along two axes: the interest development axis and the social axis.**

While students and departments often focus on each of these axes individually, finding the right balance between both axes is critical in helping students find a supportive research group. This research-based guide is designed for STEM faculty and program administrators to build or enhance their systems along these two axes.





THE INTEREST DEVELOPMENT AXIS

The interest development axis is the more formal of the two. Providing structures to help graduate students explore their research interests and find an advisor with matching interests is the main focus of this axis.

What is typical:

STEM departments provide varying formal structures to guide students in developing research interests, depending on the discipline. In fields like biology, the process is more often formalized through lab rotations to help students find a research group. In contrast, disciplines like physics offer less formal approaches, such as research seminar series where faculty introduce their work to first-year students. Departments also differ in the level of guidance they offer in selecting an advisor. Some programs expect students to choose an advisor when applying, while others have formal processes allowing students to work with multiple advisors before deciding.

What could be better (and why):

Without formal structures to explore research interests, students with broad or undeveloped research goals may face disadvantages, particularly those lacking undergraduate research experience or advanced coursework. Departments should implement structured opportunities more akin to lab rotations in the biological sciences to help students explore different research areas and understand day-to-day lab work.



THINGS DEPARTMENTS CAN DO:



IDEAL OUTCOMES FOR STUDENTS:

<p>1 Provide explicit guidance in program handbooks or other official department communications on the steps to find a research group, when they are expected to find an advisor, and what to look for in both.</p>	<p>1 Awareness of clear and actionable steps allows for an earlier, more confident search for a research group and advisor. Students may try out different groups and develop a new community of graduate students via their lab.</p>
<p>2 Implement a STEM Individual Development Plan in student advising.</p>	<p>2 Students enumerate long-term goals and develop actionable steps to meet them. Encourages students to think holistically about their responsibilities as graduate students (e.g., finding an advisor, coursework, teaching) and how to prioritize them most effectively.</p>
<p>3 Integrate topical research areas and the advisor search into the core curriculum.</p>	<p>3 Amid their busy first year, structured time to explore modern research areas and connect with potential advisors exposes students to topics they might not have encountered. As part of the formal curriculum, this also keeps group selection a priority, preventing it from being overlooked.</p>
<p>4 Spread course requirements over a longer time period to help students manage the work of finding a research group while taking coursework.</p>	<p>4 By deemphasizing coursework, students are signaled that finding the right research group is crucial, allowing them to focus more time on their advisor search. The freed-up time can be spent working with a prospective research group while still receiving TA funding, providing a low-stakes trial period.</p>



THE SOCIAL NETWORK AXIS

The social network axis is the more informal axis. Fostering connections between incoming graduate students, senior graduate students, and faculty is the main focus of this axis.

What is typical:

Informal graduate student networks play a crucial role in helping new PhD students learn about research opportunities, funding, and advisor working styles. These networks provide insights beyond research topics, helping students assess compatibility with advisors and research groups. For instance, students may learn to avoid certain labs with non-inclusive environments despite aligned research interests. A supportive graduate community can also normalize challenges in selecting or switching research groups.

What could be better (and why):

Informal graduate student networks may be important in helping students connect to a research group, but informality also disadvantages students who do not realize that building these networks is important. Building these networks can be thought of as part of the hidden curriculum of graduate school. Departments can help make this hidden curriculum explicit by hosting events and providing structures to help graduate students develop their social networks.



THINGS DEPARTMENTS CAN DO:



IDEAL OUTCOMES FOR STUDENTS:

<p>1 Host social events that support graduate student interaction.</p>	<p>1 Meeting senior graduate students helps new students learn how to search for research groups, normalizes switching groups, and offers insights into which groups might provide the best working environment.</p>
<p>2 Dedicate orientation days for touring labs and meeting advisors.</p>	<p>2 Physically visiting a lab and talking 1:1 with a prospective advisor and senior students in the lab provides a more authentic experience than listening to a research seminar. Having these experiences early can help students assess more quickly if they can envision themselves working well in a prospective group.</p>
<p>3 Provide institutional support for peer mentorship programs and graduate student associations.</p>	<p>3 Senior graduate students who are given the proper resources are able to provide critical support to new students, who gain a network of go-to peers to ask questions about the first year of graduate school - including what to look for in prospective research groups.</p>
<p>4 Support within-department grad-student conference events demonstrating breadth of research.</p>	<p>4 Students often struggle to learn about the various research happening in their department, so why not bring the research to them? New students can meet senior students to discuss their work and lab experiences, potentially discovering new research topics to pursue.</p>

CONCLUSIONS

By ensuring that graduate students find the right research group early on in their doctoral journeys, departments help set up all of their students for success in their graduate programs and beyond.

Many students enter graduate school knowing a research group impacts them both intellectually and socially, but balancing shared research interests with a healthy lab culture is key to finding the right fit.

Departments should therefore build or enhance their structures for helping students select research groups along the interest development and social network axes. In doing so, departments can make sure that all students have the information that helps ensure a positive outcome, regardless of what resources they may have had access to as undergraduate students.

FURTHER READING ON SUPPORTIVE RESEARCH GROUPS

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