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## **How do undergraduate and graduate researchers learn, i.e., what is the mechanism?**

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How do undergraduate (UG) and graduate researchers learn? This ethnographic study of the development of novice scientific researchers documents the learning environment of a research lab doing organic synthesis. The theoretical framework is situated cognition. The data reveal that all researchers are reasoning about their work. Findings include a) daily details of researchers thinking and acting on their own projects, b) conditions that guide inquiry, and c) interactions that coordinate meaningful scientific learning. We demonstrate scientific reasoning in the manners in which we found it to be operating among researchers. One mechanism that pulls resources, standards, chemical language and mechanical systems together is the reasoning in problem solving, particularly instrument feedback, discussions, and requested scaffolding.