

## **PLB & PRL SEMINAR SERIES**

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Department of Plant Biology and Plant Research Laboratory**

**Investigating Common Origins of  
Diverse Biological Misconceptions:  
Cognitive Science, Intuitive Reasoning, and the  
Development of Biological Thinking**

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**Monday, October 24, 2016**

**at 4:10 pm, Room BCH 101**  
(Refreshments at 4:00 pm)

Research and theory development in cognitive psychology and science education research remain largely isolated. Biology education researchers have documented persistent scientifically inaccurate ideas, often termed misconceptions, among biology students across biological domains. In parallel, cognitive and developmental psychologists have described intuitive conceptual systems – teleological, essentialist, and anthropocentric thinking – that humans use to reason about biology. We hypothesized that seemingly unrelated biological misconceptions may have common origins in these intuitive ways of knowing. We presented undergraduate biology majors and non-majors with biological misconceptions. They indicated their agreement with each statement, and explained their rationale for their response. Results indicated frequent agreement with misconceptions, and frequent use of construal-based reasoning among both biology majors and non-majors in their written explanations. Moreover, results also showed associations between a specific form of intuitive reasoning that was hypothesized to perhaps underlie a particular misconception. Strikingly, such associations between intuitive reasoning and misconceptions were stronger among biology majors than non-majors. These results demonstrate important linkages between intuitive ways of thinking and misconceptions in discipline-based reasoning, and raise questions about the origins, persistence, and generality of relations between intuitive reasoning and biological misconceptions.