



Biology Seminar

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Exploring the fern vascular system from past to present



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One of the most important innovations in land plant evolution was the development of a vascular system (the set of tubes that moves water and nutrients through the body). These conducting tissues amplified mass flow

rates by orders of magnitude, allowing plants to increase their photosynthetic capacity, grow larger, and alter aspects of the terrestrial ecosystem including carbon dioxide sequestration and increased oxygenation, in turn, profoundly affecting the course of evolution for life on land. The three-dimensional arrangement of vascular tissues within the stem (vascular architecture) is remarkably variable across living and extinct plants. Some of the most impressive displays of this variation occur in the ferns, a diverse clade of land plants with a nearly 400-million-year evolutionary history. Despite over two centuries of study on the vascular system, we lack a detailed understanding of why this diversity exists and how it has evolved. Using an arsenal of methodologies and tapping into the wealth of information locked up in herbarium specimens, I provide answers to these questions and overturn long held hypotheses on the structure, function, and evolution of the fern vascular system. To hear more about this work, please join my seminar on January 25th!

