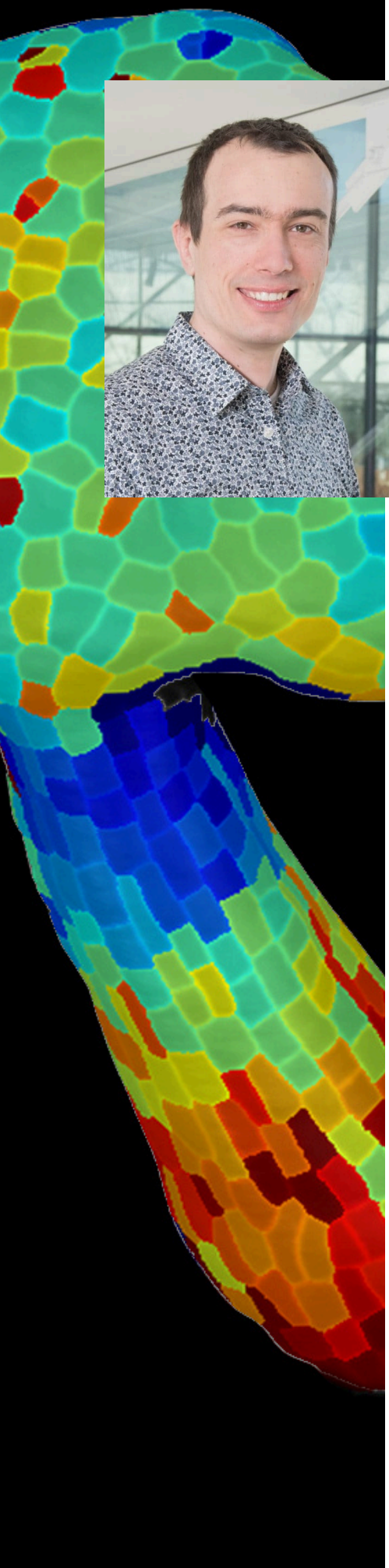

CSB DEPARTMENTAL SEMINAR

Mechanical interactions between tissue layers underlie plant morphogenesis

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Differential growth between tissues generates mechanical conflicts regulating organogenesis in plants. Here, we use the anther–floral male reproductive organ–as a model system to understand how cell dynamics and tissue-scale mechanics control the 3D morphogenesis of a complex shape. Combining deep live cell imaging, growth analysis, osmotic treatments, genetics, and mechanical modeling, we show that localized expansion of internal cells actively drives anther lobes outgrowth, while the epidermis passively stretches. At later stages mechanical load is transferred to the subepidermal layer (endothecium), contributing to proper organ shape. We propose the concept of inflation potential, encapsulating mechanical and anatomical features causing differential growth. Our data emphasizes the active mechanical role of inner tissue in controlling both organ shape acquisition and cell dynamics in outer layers.

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