Every plant tells a story. A story of growth and new organ formation, of a lifetime of mechanical stresses due to wind and gravity, of the constant need to obtain sunlight by growing up, as well as downward into the soil to obtain water and nutrients. The goal of this seminar is to read and discuss the rapidly expanding field of plant form: specifically to understand plants as active structures, integrating information about their own shape (proprioreception) and the physical world in which they live.

We will spend a lot of time asking why plants look the way they do, including going outside to look at plants on campus and beyond. We will consider not only outward form, but also the internal structure of the plant vascular system. Readings will draw from both current and classical literature, with students taking an active role in leading paper discussions. Topics to be covered include:

Gravitropism

Proprioreception

Dynamic loading: wind

Reaction wood

Phyllotaxy

Leaf shape

Climbing (twining/tendrils)

Root/soil interactions

A detailed syllabus will be posted soon. Contact Prof. Holbrook with any questions (holbrook@oeb.harvard.edu). Relevant background: interest in plants, familiarity with mechanics and molecular biology will be helpful. Students will complete and present a final project on a topic of their choice.

Location: Bio Lab 2025; Tuesdays at 12:45 - 2:45 pm