

**Eric Brenner, PhD**  
**Department of Biology**  
**Dyson College of Arts and Sciences**

***Plant Tracer*, a learning App to quantify plant movement**

*Plant Tracer*, an NSF-IUSE funded learning iOS App, that enables students to track plant movement from time-lapse movies. *Plant Tracer* enhances plant biology learning through the study of plant motion via a gene discovery process, thereby raising students' interest in plant biology. *Plant Tracer* quantifies gravitropic shoot reorientation and the physical parameters of shoot circumnutation (the poorly understood process of regular, cylindrical motions) in *Arabidopsis*. When plants are turned on their side, the plant shoot will curve up from a horizontal position. Gravitropism is a core concept taught in most standard undergraduate biology curricula. Proper gravitropic responses are important for plant health and food production, hence numerous genetic screens have isolated gravitropic mutants in roots. Few gravitropic mutants have been isolated in shoots serving as a fertile area of inquiry for hypothesis-driven, student-centered learning. Students use *Plant Tracer* to identify mutant plants defective in shoot gravitropism. This proposal requests support to

- 1) Improve *Plant Tracer* functionality, which will increase its appeal to other instructors.
- 2) Develop *Plant Tracer* to function also on Android.
- 3) Purchase supplies for cultivating plants and a computer for testing the new *Plant Tracer*.
- 4) Provide a small stipend for the project manager on this project.