Plant Gravitropism Research

Since plants are the basic food source for humans, it is important to understand their growth and development and to improve plant growth and agriculture. In order to improve productivity, we need to understand how plants respond to their environment and their requirements for water, light, resistance to disease, etc. All of these factors interact strongly with gravity, one of the most important environmental cues for plant development. Thus, understanding how plants perceive and respond to gravity is a significant area of biological research and will help to better identify the factors that control plant growth and productivity. Due to the significance of the gravity effect, research on the effects of gravity has been supported by NASA, NSF and other federal agencies. Understanding the effects of gravity is also one of the major fields of research of the ASGSB.

Members of our society, funded by NASA, have conducted research on both ground-based (gravitropism) and space flight research (space biology) with plants. Most of these efforts are in the category of basic research, which will have an important impact in terms of long-term benefits to society. Some accomplishments of the research efforts by our membership include:

- Identifying factors that determine plant growth.
- Deciphering the molecular basis of the response of plant cells to environmental stimuli.
- Understanding the factors necessary for plants to complete a seed-to-seed life cycle in microgravity.
- Improving the development of plant growth facilities.
- Elucidating the effects of microgravity and spaceflight on starch metabolism.
- Expanding the understanding of the effects of various gases (e.g., oxygen, ethylene) on plant growth.
- Improving our understanding of how to use plants to further the human exploration of space.
- Developing genetically engineered biomonitors that can be used in space or on Earth.
- Using space experiments to generate new strategies to genetically improve plants.

For more information, visit ASGSB at: http://www.asgsb.org/.

The American Society for Gravitational and Space Biology asks for your support for the Life and Microgravity Sciences research programs of NASA, as we strive to keep America leading the world in utilizing space for improving life.