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OKINAWA INSTITUTE OF SCIENCE AND TECHNOLOGY GRADUATE UNIVERSITY  
沖縄科学技術大学院大学

OIST Presidential Lecture Series 5

# Science, Biology and the World's Future

**Dr. Bruce Alberts**

*Chancellor's Leadership Chair  
in Biochemistry & Biophysics for Science & Education.  
University of California, San Francisco*

**Fri, Oct 12**

Center Bldg.

**13:30 to 15:00 B250**



There are many exciting challenges ahead for biologists. The chemistry of living organisms is so complicated that new scientific breakthroughs will be required to understand it. These understandings are certain to generate powerful new approaches for meeting human needs in health, agriculture, and the environment -- with model organisms like *Drosophila* continuing to provide essential shortcuts for deciphering the biology of humans and other multicellular organisms.

In addition, to make sense of the complexity will require powerful mechanisms of analysis not yet invented. As one example, even when scientists have determined each of the hundreds of different molecular interactions that create the actin cytoskeletal system, and know the three-dimensional structures and rate constants for the formation and disassembly of each of its possible sub-complexes, the challenge of computing the outcomes will remain. In the same sense, most of the interesting properties of cells and organisms are "emergent properties", resulting from a large network of interactions that have non-intuitive outcomes.

Most broadly, the knowledge and the problem-solving skills of scientists are critical for every nation – no matter how rich or poor. Thus, for example, science has produced a deep understanding of the natural world that often enables an accurate prediction of the consequences of current actions on the future. In addition, every society needs the values of science: honesty, generosity, and an insistence on evidence while respecting all ideas and opinions regardless of their source of origin. To spread such values, science education needs to be redefined at all levels, with much less emphasis on the memorization of science facts and terms. Instead, we should be providing empowering experiences in problem-solving that take advantage of the curiosity that children bring to school and increase a student's understanding of the world. Closely related changes in the introductory science courses in college, emphasizing "science as a way of knowing," are the key to driving these reforms.

Contact

Office of the President



[president@oist.jp](mailto:president@oist.jp)