the nucleotide-free and ADP states. This implies that in some part of myosin VI's ATPase cycle, the lever arm uncouples from the motor, which could arise from elongation of the lever arm. Lever arm elongation may provide the long step (30 nm) of myosin VI with a short lever arm (8 nm).

Thus we have established a new, single-molecule fluorescence technique, FIONA, which is able to resolve steps of a few nanometers taken by molecular motors. FIONA assays on myosin V, myosin VI, and kinesin have revealed that these motors move by walking hand over hand, not by "sliding" like an inchworm, nor by "diffusing" along the cytoskeleton. FIONA is also a broadly applicable technique in other fields of molecular biology, such as DNA sequencing and particle tracking in vivo.

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2005 Grand Prize Winner >>

Ahmet Yildiz, the author of the prize-winning essay and a North American regional winner, grew up in Sakarya, Turkey. In 2001, he received a bachelor's degree in physics from Bogazici University, Istanbul, and started his graduate studies in biophysics at the University of Illinois Urbana-Champaign. Working in the research group of Dr. Paul Selvin, he developed the technique of fluorescence imaging with one-nanometer accuracy (FIONA). This work was recognized with a Foresight Institute Distinguished Student Award in 2003. He went on to use FIONA to study the molecular walking mechanism of the motor proteins myosin V, myosin VI, and kinesin. Dr. Yildiz received his Ph.D. in 2004, and his thesis was awarded the Gregorio Weber International Prize in Biological Fluorescence. In 2005, he moved to the University of California, San Francisco, where he is a postdoctoral fellow in the research laboratory of Dr. Ronald Vale. He is currently studying the structural mechanism of cytoplasmic dynein.

Regional Winners

North America: Nieng Yan for her essay, "Mechanisms of Programmed Cell Death in *Caenorhabditis elegans*." Dr. Yan was born in Jinan, China, in 1977 and grew up in Beijing. As an undergraduate at Tsinghua University, she developed a strong interest in science and was also deeply influenced by Beijing's unique civil milieu. After receiving a bachelor's degree in biology in 2000, she traveled to New Jersey to pursue graduate training in the Department of Molecular Biology at Princeton University. Under the guidance of Dr. Yigong Shi, she used structural biology and biochemistry techniques to elucidate the molecular mechanisms of cell death regulation. Dr. Yan received her Ph.D. in December 2004 and is currently completing research projects in Dr. Shi's lab. Her goal is to continue in an academic career.

Europe: Marina Aspholm for her essay, "Adaptation of *Helicobacter pylori* Adherence Properties in Promotion of Host Tropism and Inflammatory Disease." Dr. Aspholm comes from Kiruna, Sweden, a city famous for an ice hotel that is constructed anew each winter. Dr. Aspholm studied chemistry and molecular biology at Umeå University and received a Master of Science degree in 1998. She remained at Umeå University for Ph.D. studies through a fellowship from the Swedish Foundation for Strategic Research. Under the guidance of Dr. Thomas Borén, she examined how the gastric pathogen *Helicobacter pylori* adapts its adherence properties to fit predominant patterns of gastric mucosal cell surface glycosylation. During this time, she also collaborated with the group of Dr. Douglas Berg, Washington University, St. Louis, Missouri. Dr. Aspholm defended her Ph.D. thesis in 2004 and now holds an EMBO long-term fellowship and is a research scientist in the laboratory of Dr. Michael Koomey at the University of Oslo, Norway.

Japan: Rikinari Hanayama for his essay, "Impaired Phagocytosis of Apoptotic Cells and Development of Autoimmune Diseases." Dr. Hanayama was born in 1974 and grew up in Osaka, Japan. He obtained an M.D. degree from Osaka University in 1999. After a year as a medical intern, he decided to pursue basic research and joined the laboratory of Dr. Shigekazu Nagata as a graduate student. There he identified a molecule that promotes the phagocytosis of apoptotic cells and showed that the inefficient removal of the apoptotic cells can lead to autoimmune diseases. Dr. Hanayama was awarded a predoctoral fellowship from the Japan Society for the Promotion of Science in 2002 and received his Ph.D. and the Yamamura Award from Osaka University in 2004. After working as an instructor in genetics with Dr. Nagata, he joined the laboratory of Dr. Michael E. Greenberg at Children's Hospital Boston/Harvard Medical School with a long-term postdoctoral fellowship from the Human Frontier Science Program.

All Other Countries: Jianmin Zhang for his essay, "Establishment of Transcriptional Competence in Early and Late S Phase." Dr. Zhang was born in Tianjin, People's Republic of China. After graduating from Tianjin Medical University, he worked as a research associate at Tianjin Infectious Diseases Hospital. In 1996, he began graduate studies at the Hebrew University of Jerusalem, where he first obtained an M.Sc. under the guidance of Prof. Hagai Ginsburg in the Department of Biological Chemistry and then joined Dr. Howard Cedar's lab at the Hadassah Medical School. Life in a foreign country was made easier by the support he received from Dr. Cedar. His studies on gene repression suggested a mechanistic connection between DNA replication timing and gene expression. Dr. Zhang received his Ph.D. in 2004 and was awarded The Aharon Katzir Prize. He is now a postdoctoral fellow in Dr. Daniel Haber's laboratory at the Cancer Center, Massachusetts General Hospital and Harvard Medical School. Dr. Zhang's life was recently made richer by the arrival of a baby daughter.

For the full text of essays by the regional winners and for information about applying for next year's awards, see *Science* Online at www.sciencemag.org/feature/data/prizes/ge/index.dtl