

# Cytoskeletal Motor Proteins Part 2

- Compare the similarities and differences between dynein and the other classes of cytoskeletal motor proteins (kinesins, myosins)
- Consider how studies of cytoskeletal motor proteins contribute to advances in biomedicine
- Consider other fields where basic research on cytoskeletal motor proteins has had an impact

# **Molecular Motors**

## **New Data & Research in**

### **Applications for Nanotechnology**

### **and Nanomedicine**

- <http://www.knowledgefoundation.com/molecular2000.html>

## Biomedical Applications of Molecular Motors

- **Implantable Molecular Factories**

*Mauro Ferrari, Ph.D., Professor of Internal Medicine, Professor of Mechanical Engineering, Director, Biomedical Engineering Center, The Ohio State University; Chairman, Ohio MicroMD: The BioMEMS Consortium on Medical Therapeutics; Editor-in-Chief, Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology*

Our laboratories are pursuing the vision of implantable cell bioreactors, both of the cellular and molecular type, with the objective of providing physiologically delivered medical therapy. The first indication we have pursued is Type I insulin-dependent diabetes mellitus, for which we employ a micromachined immunoisolation biocapsule with nanopore permselective external surfaces. Molecular bioreactors will also be introduced in this presentation.

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- **Molecular Motors as Therapeutic Targets in Human Medicine**

*James Sabry, M.D., Ph.D., President and CEO, Cytokinetics, Inc.*

The human genome contains a rich array of molecular motor proteins that carry out a large number of highly specific tasks. Many of these tasks are integrated into biological pathways that are known to be important for disease treatment. We are developing technologies to interrogate these proteins with small molecule compounds and to develop these compounds into a novel class of therapeutics for cancer, cardiovascular disease, infectious and inflammatory disease and neurological disorders.

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- **Engineering Life into Nanofabricated Devices**

*Carlo Montemagno, Ph.D., Associate Professor, Department of Biological Engineering, Cornell University*

Presented will be the details for fabricating nanomechanical devices powered by molecular motors including results of the first, functional biomolecular motor powered nanomechanical device ever successfully fabricated. Included will be experimental results of efforts to incorporate such devices into living cells and in the creation of submicron sized “Smart Dust” (i.e. autonomous sensor systems).

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