



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

AIMBE/NIH summit on Validation and Qualification of New *In Vitro* Tools for the Pre-Clinical Drug Discovery Process

James J Hickman, Ph.D. *AIMBE Fellow*

Christine Kelley, Ph.D. *AIMBE Fellow*



What is AIMBE?

Provides leadership and advocacy in medical and biological engineering for the benefit of society.

- Founded in 1991
- 282 Founding Fellows (1992-1993)
- Today ~ 1200 Fellows
- Current membership includes:



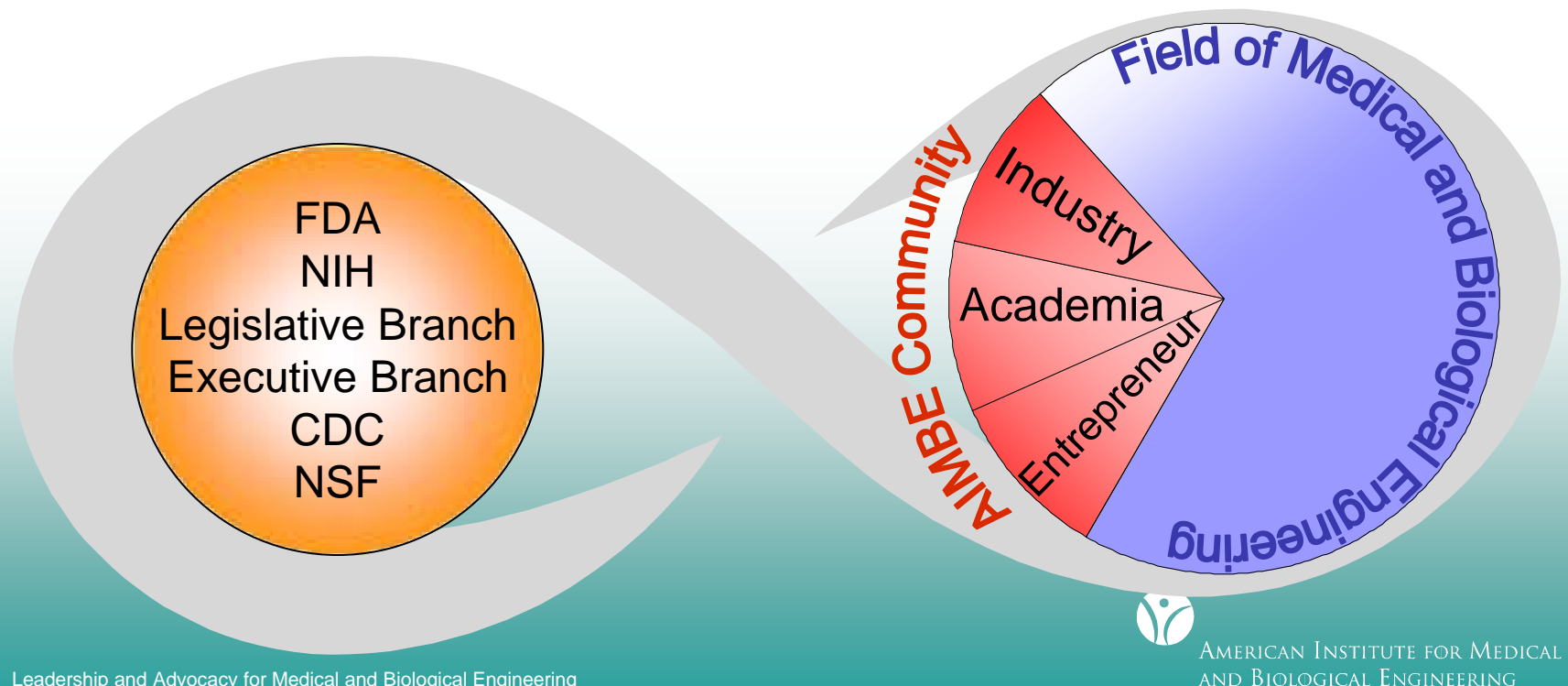
- **AIMBE Represents ~ 50,000 Biomedical Engineers**



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

AIMBE: Fostering Innovation

Collaboration among Industrial, Academic, and Entrepreneurial members of AIMBE's Industry Council and Government guides science and technology translation from the medical and biological engineering community.



Engineering and Regulatory Sciences

Input actuators

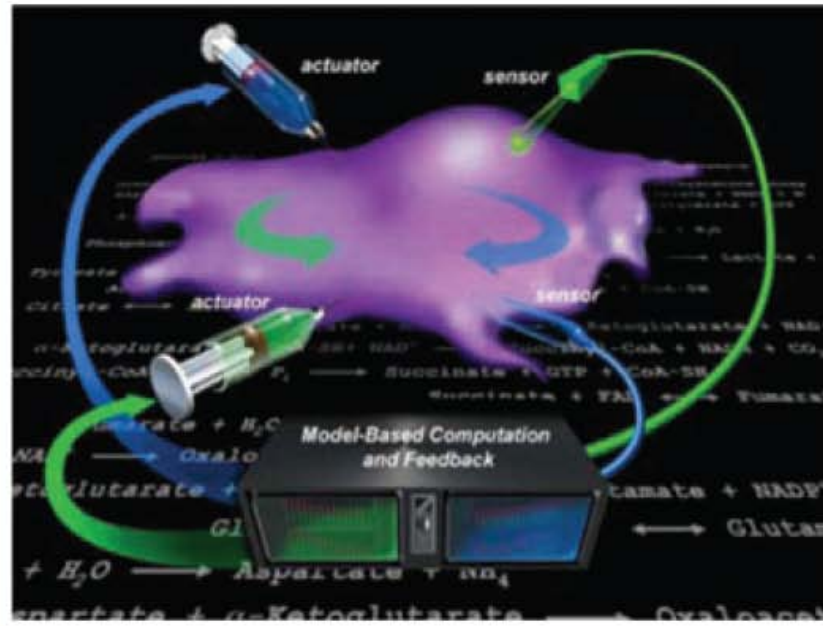
- Chemical
- Electrical
- Genetic
- Mechanical
- Optical
- Thermal
- Scaffolding

Controller

System dynamics

Output sensors

- Apoptosis
- Differentiation
- Gene/protein expression
- Growth
- Metabolism
- Motility
- Signal transduction



How Do Control-Based Approaches Enter Into Biology

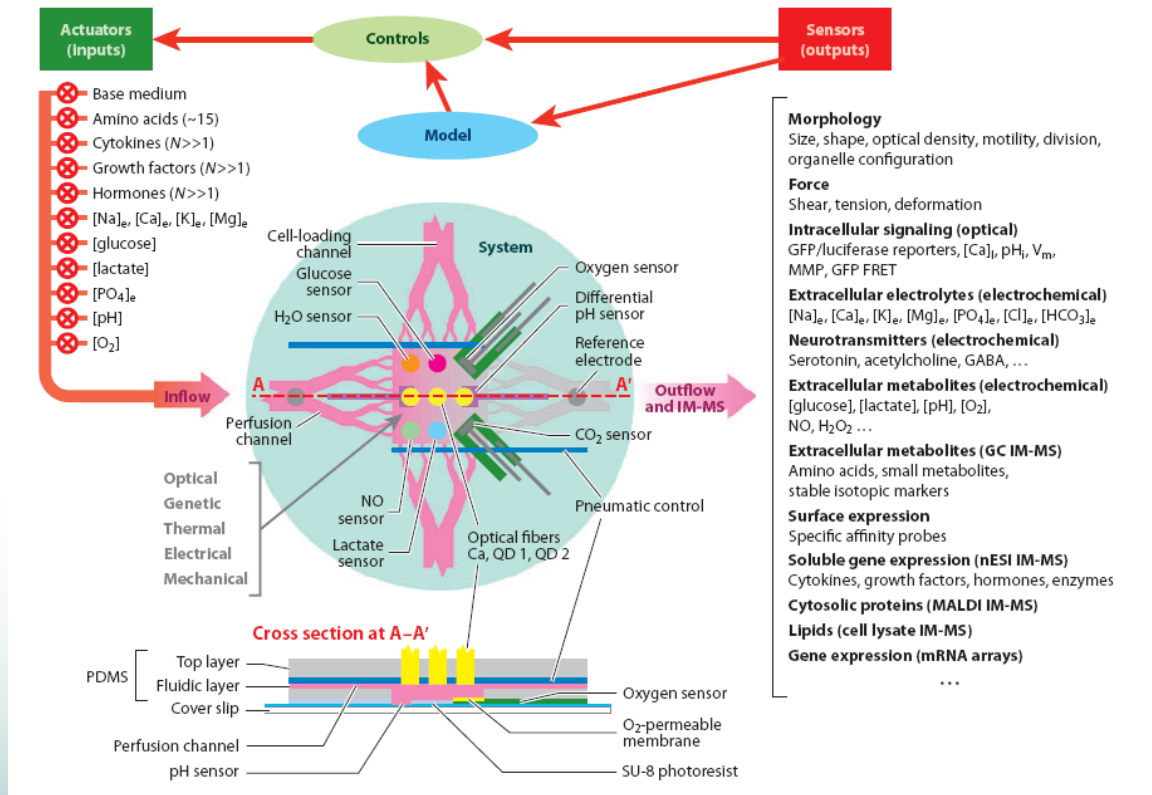
Philip R. LeDuc, William C. Messner and John P. Wikswo

Annu. Rev. Biomed. Eng. 2011. 13:369-396



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

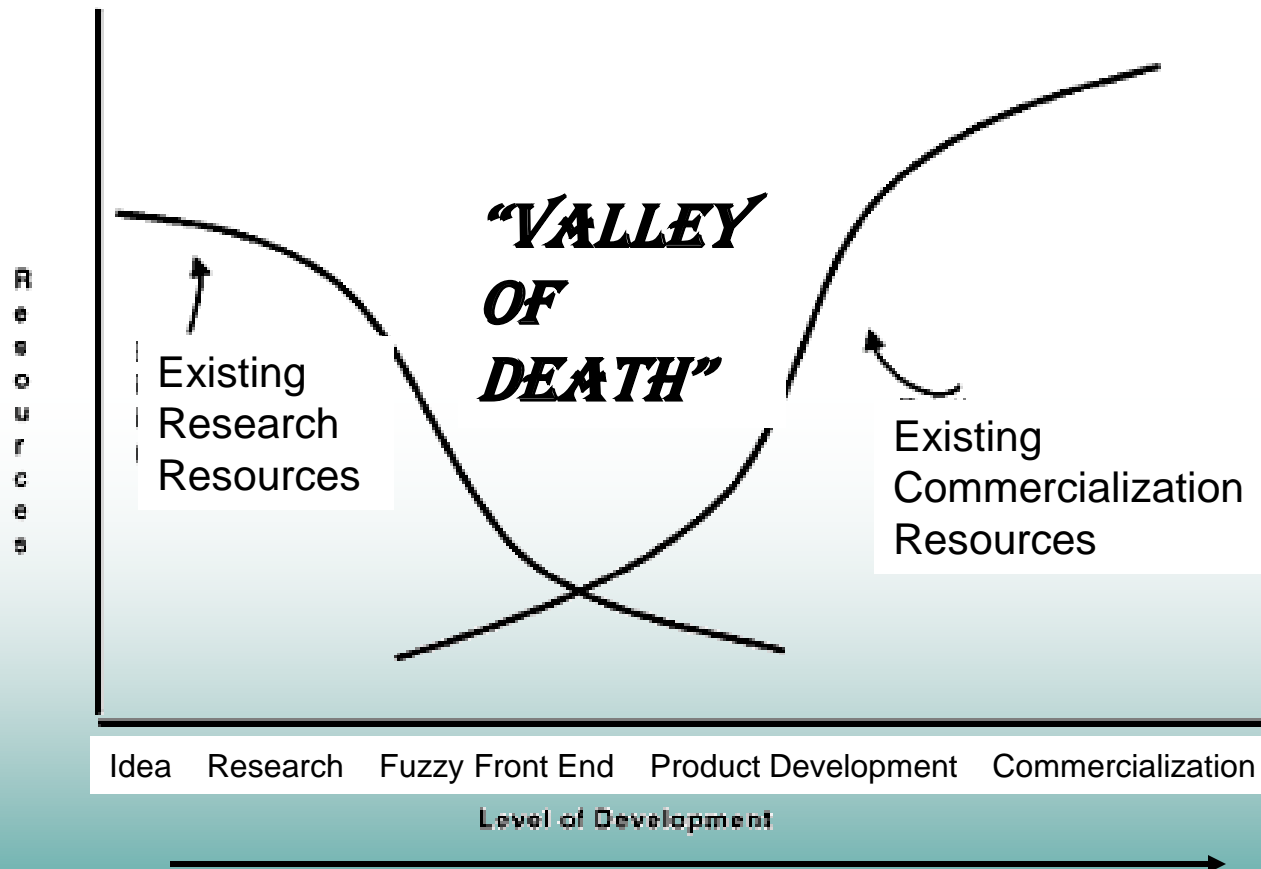
Analytical Model of Multiple Input/Output System



Philip R. LeDuc, William C. Messner and John P. Wikswa
Annu. Rev. Biomed. Eng. 2011. 13:369-396



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING



Re-engineering Pharmaceutical R&D

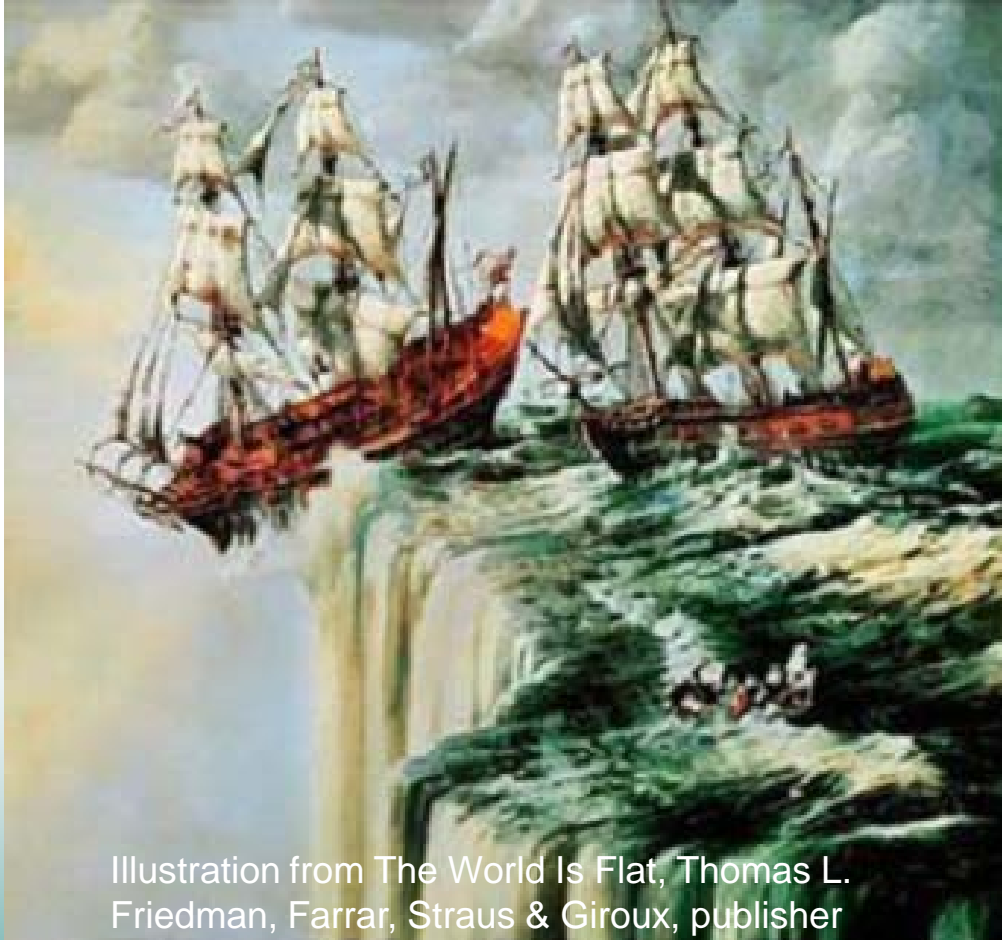


Illustration from The World Is Flat, Thomas L. Friedman, Farrar, Straus & Giroux, publisher

“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”

Charles Darwin
(1809-1882)



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

Re-engineering Pharmaceutical R&D



"It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change."

Charles Darwin
(1809-1882)

Illustration from *The World Is Flat*, Thomas L. Friedman, Farrar, Straus & Giroux, publisher

Leadership and Advocacy for Medical and Biological Engineering



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

THANK YOU AND WELCOME

**American Institute for Medical and Biological
Engineering**

**1701 K St., NW, Suite 510
Washington, DC 20006**

**Raphael C. Lee, MD, ScD, FACS
President, AIMBE**

Phone: 202-496-9660



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

Why is advocacy important?



AMERICAN INSTITUTE FOR MEDICAL
AND BIOLOGICAL ENGINEERING

What does AIMBE Do?

A vehicle for input of biomedical engineering expertise into public policy making process:

AIMBE:

- *Promotes awareness of medical and biological engineering as a resource to solve common problems*
- *Works with lawmakers, government agencies, and other professional groups to support public policy impacting research and development*
- *Promotes the national interest in education, science, and engineering*



MBE and the Quality of Life of Americans

