

Designing for Impact I: Workshop on Building the National Network for Manufacturing Innovation



ADVANCED MANUFACTURING NATIONAL PROGRAM OFFICE

Host Welcome

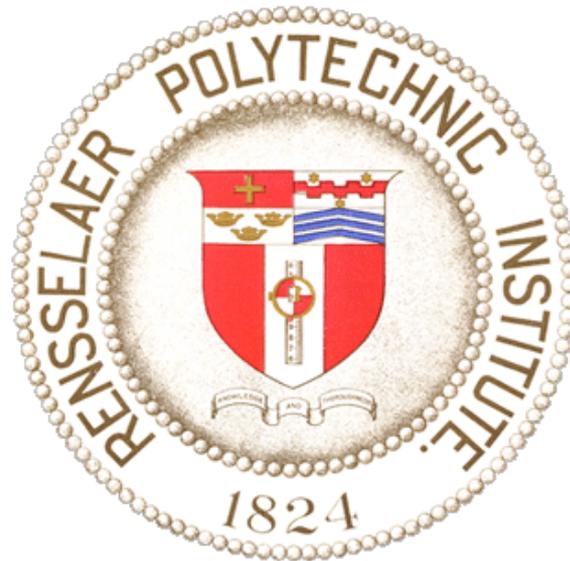


Jonathan Dordick

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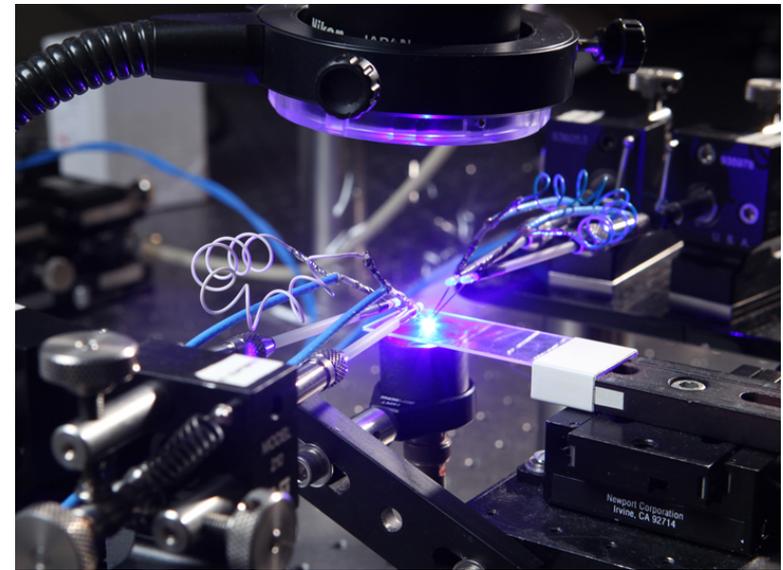
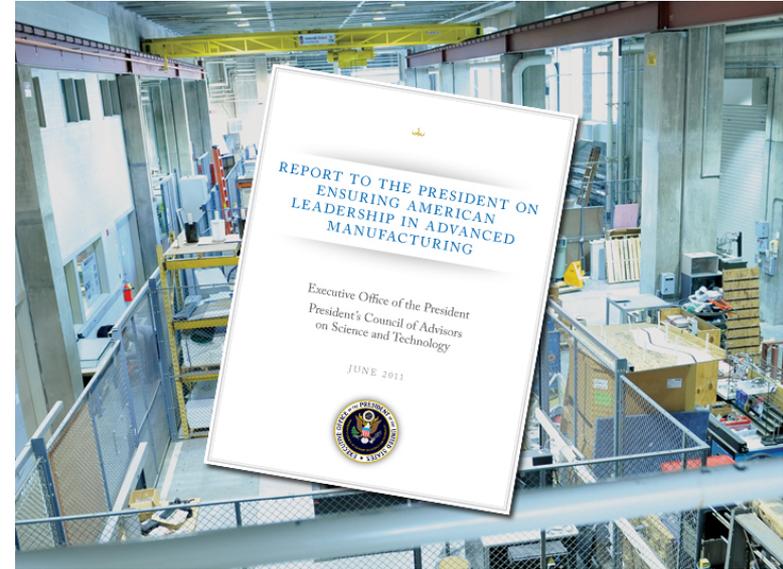
Workshop on Building the National Network for Manufacturing Innovation

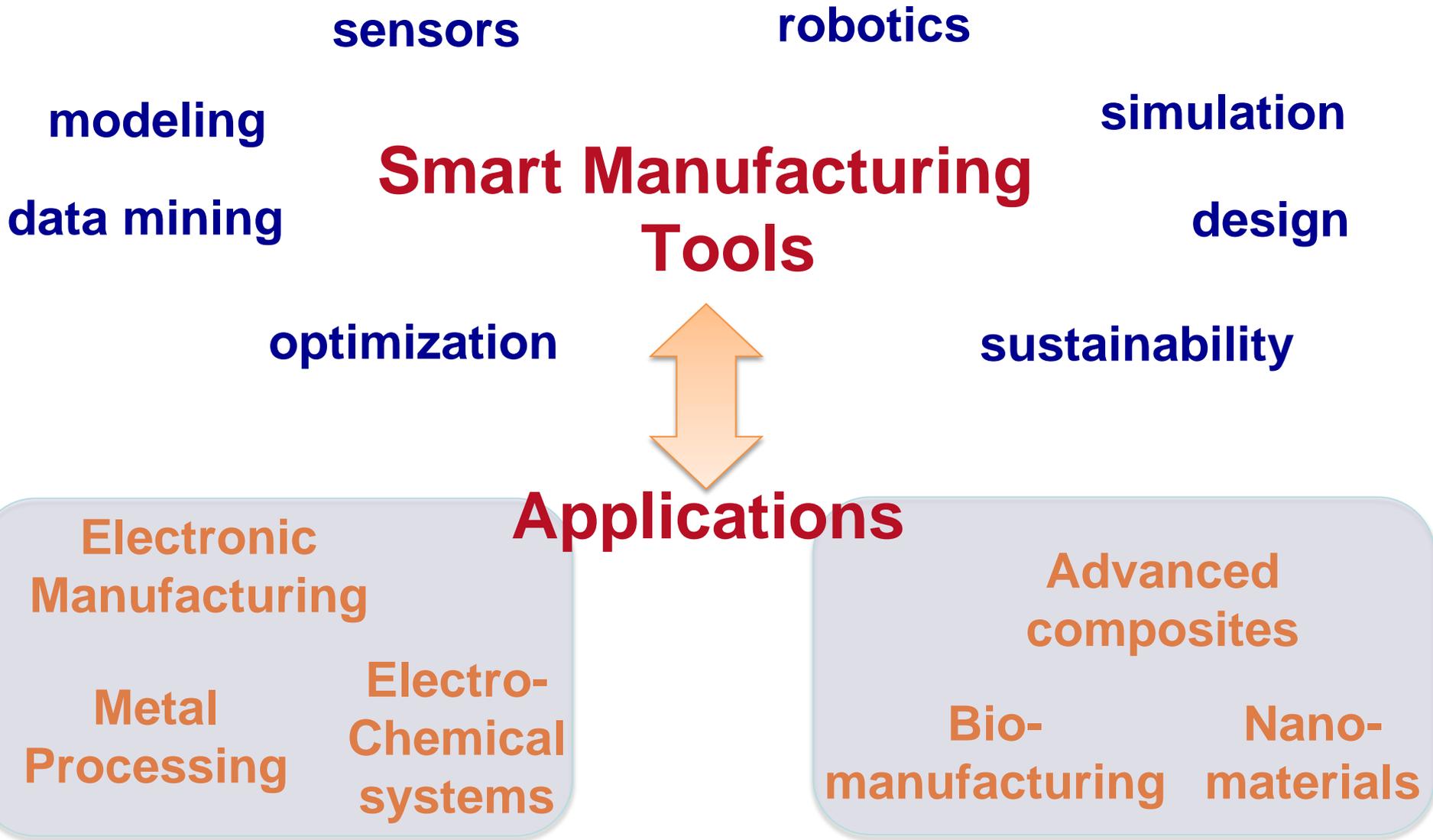
Designing for Impact

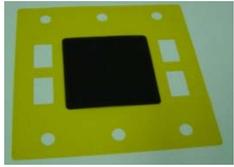


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concept



prototype



production



continuing
innovation



Ecosystem of manufacturing research



Safe and Sustainable
Healthcare Infrastructure

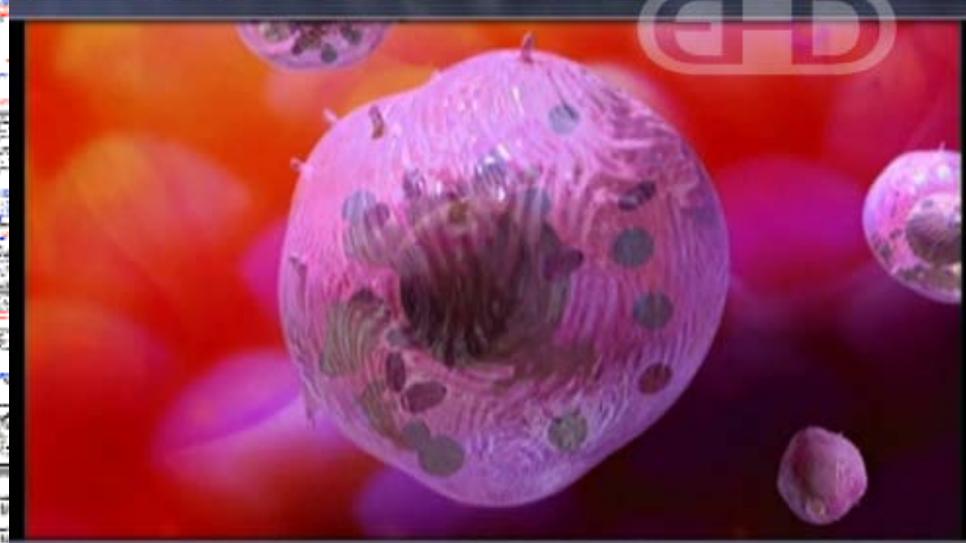
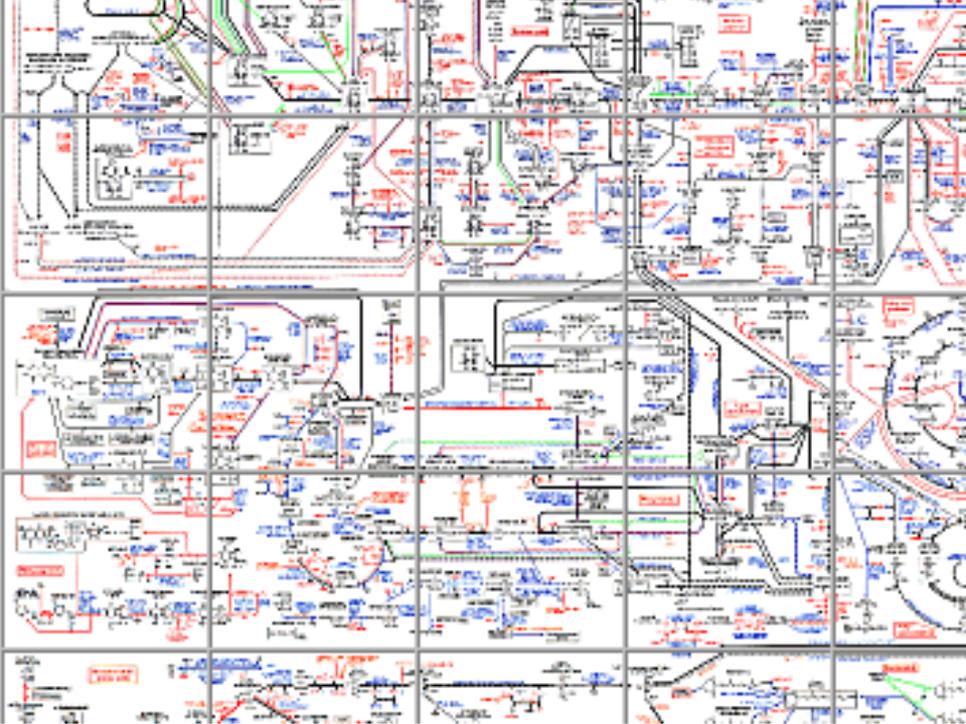
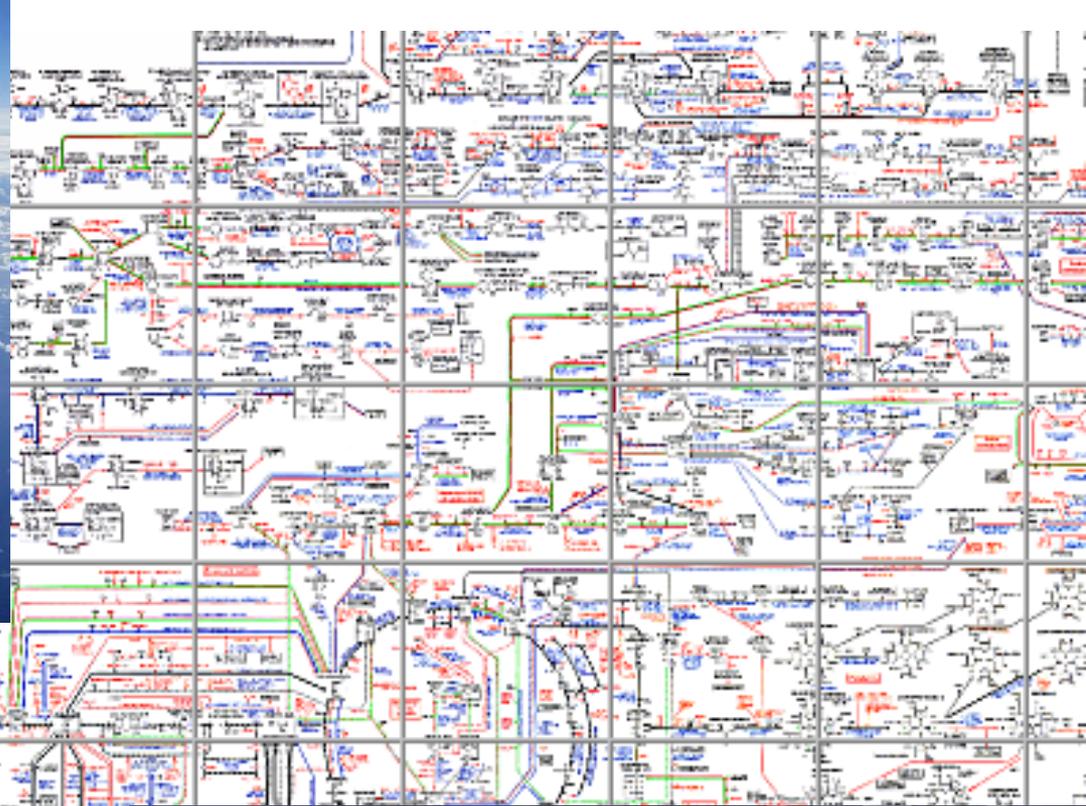


Safe Food Processing
and Packaging



Safe and Pure
Biopharmaceuticals

- **Hospital-acquired infections are the 4th/5th leading cause of death in the U.S.**
 - ✦ WHO → we are headed back to the early 20th Century where routine infections were lethal
- **Nearly 50 million cases of food poisoning annually in the U.S. alone.**
 - ✦ Economic impact of \$7B annually and 1/4 of all freshwater use
 - ✦ Annual energy waste equivalent to ca. one month of petroleum use
- **Current manufacturing processes for therapeutic proteins do not scale**
 - ✦ Affordability of healthcare/treatment
 - ✦ Biomanufacturing and ensuring U.S. competitiveness



Biology is Complex

Heparin extensively used as an anticoagulant drug critical in modern medicine in the treatment of DVT, in kidney dialysis, open heart and other surgeries. Market \$7-10 B/yr. Approx. 700 million hogs slaughtered annually to supply 100 tons of heparin per year.



FDA Asks for \$275 Million To Aid
in Drug Inspections

THE WALL STREET JOURNAL.

The FDA and safety—beyond the heparin crisis

nature

Researchers pursue artificial heparin

The Philadelphia Inquirer

China: N.J. plant may be at fault in
heparin crisis

DAILY NEWS

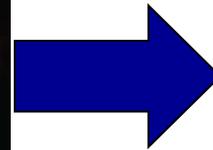
Report Confirms Source of
Contaminated Heparin

The Washington Post

Concerns flare again over use of heparin

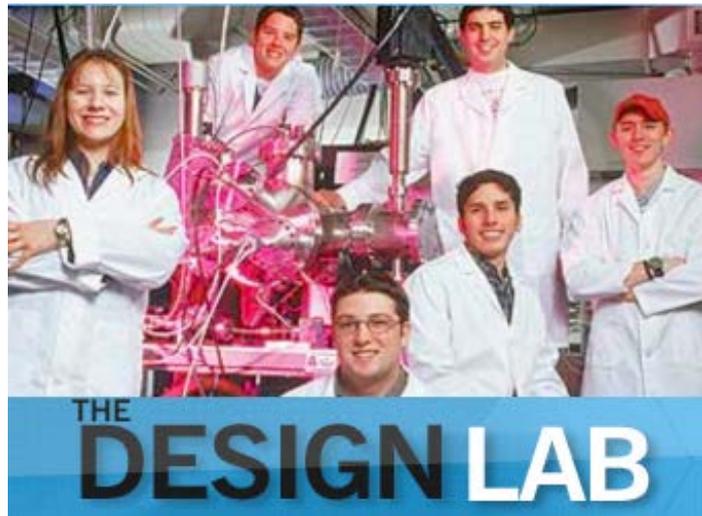
The Seattle Times





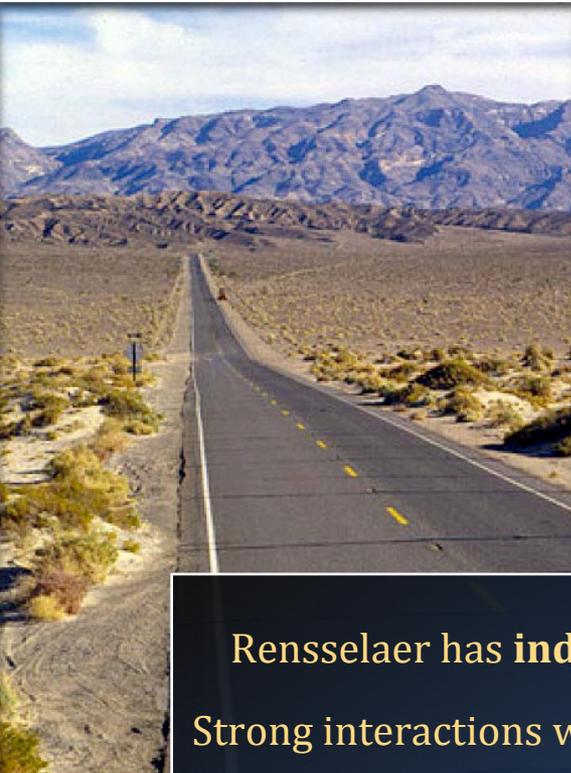
- Bring heparin manufacturing into the 21st Century
- Establish heparin as a major focus of biomanufacturing in the U.S., Europe, and Japan
- Major funded project at Rensselaer from NIH and industrial partners
- FDA interested in de-listing pig heparin upon development of bioengineered version being a generic

Advanced Manufacturing Laboratory

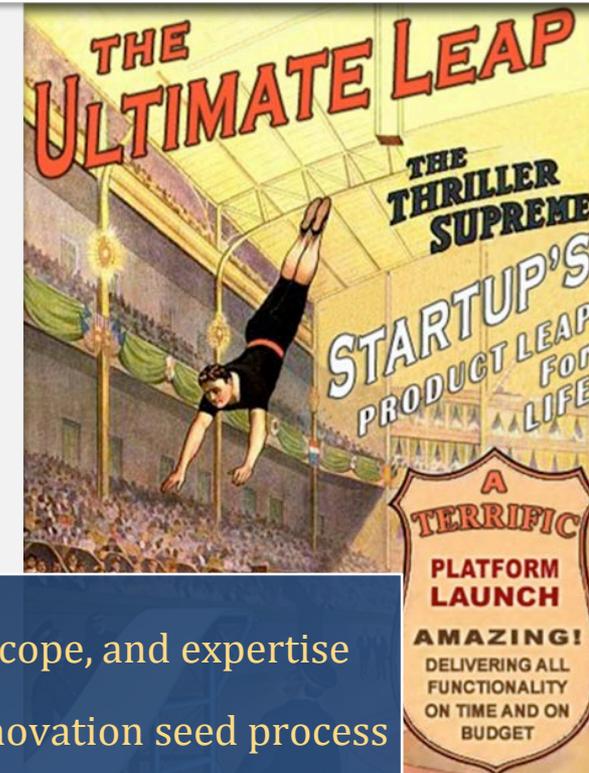


The O.T. Swanson Multidisciplinary Design Laboratory

A fundamental innovation gap exists between academic research and commercial adoption



- Prevents effective and efficient translation of basic and applied research into competitive commercial products
- Restricts innovation that drives new ideas and collaboration
- Limits value added benefits that occur through translating university research



Rensselaer has **industry partners who** are diverse in size, scope, and expertise
Strong interactions with **venture capital groups** assist the innovation seed process



