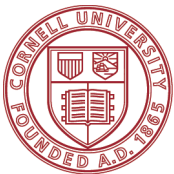


# Bringing Clinical Medicine into Biomedical Engineering

## ***HHMI Med-into-Grad Initiative***

Program director: William Olbricht, Ph.D.  
wlo1@cornell.edu

Co-director: Peter Doerschuk, Ph.D., M.D.  
pd83@cornell.edu



Cornell University  
Department of  
Biomedical Engineering

HHMI  
HOWARD HUGHES MEDICAL INSTITUTE

## Biomedical Engineering at Cornell

- *Department founded in 2002*
- *14 “core” faculty*
- *51 “field’ faculty*
- *Weill Hall opened in 2008*



- Biomedical Engineering
- Weill Institute for Cell and Molecular Biology
- Biological Statistics and Computational Biology

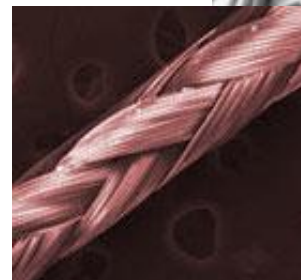
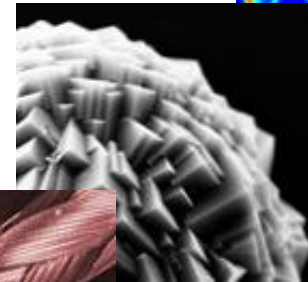
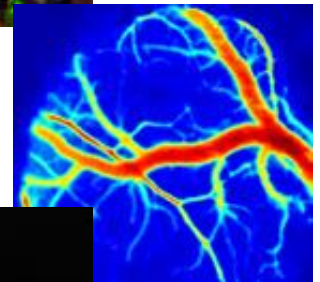
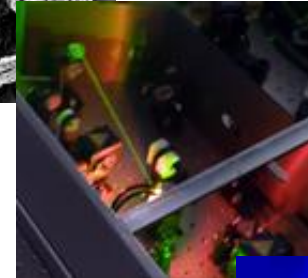
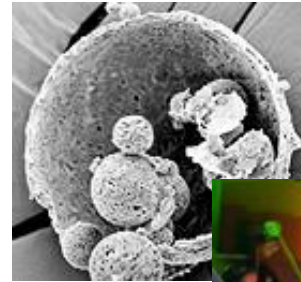
Biomaterials and Drug Delivery

Biomedical Mechanics

Biomedical Imaging

Micro- and Nano-biotechnology

Molecular, Cellular, and Tissue Engineering



# Bringing Clinical Medicine into Biomedical Engineering

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## 1. Core Concepts in Disease – a new course for first-year graduate students

Most diseases emerge from a relatively small number of causes

- infection
- inflammation
- ischemia
- neoplasia
- protein misfolding
- metabolic dysregulation

# Bringing Clinical Medicine into Biomedical Engineering

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1. Underlying biology of the disease pathway
  2. Clinical management of diseases implicated in the pathway
  3. Technology that expedites therapy

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## 2. Summer Immersion Term – first-year graduate students

- A 7-week clinical immersion
- Clinical faculty mentors
- Clinical shadowing
- Clinical research mini-project
- NIH T35 + HHMI

*Medicine, surgery, neurosurgery,  
pediatrics, urology, radiology,  
orthopedic surgery*



Weill Cornell Medical College

 **NewYork-Presbyterian**  
The University Hospital of Columbia and Cornell

# Bringing Clinical Medicine into Biomedical Engineering

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## 2. Summer Immersion Term – first-year graduate students



# Bringing Clinical Medicine into Biomedical Engineering

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## 3. HHMI Med-into-Grad Scholars

- One-year fellowships to promote and sustain clinical research collaborations
- HHMI Scholars will be co-mentored by BME and Weill clinical faculty
- Competition based on F32-style proposal
- Quality of proposed research and co-mentoring plan
- Four scholars selected for the 2010-11 academic year
- Stipend, tuition, and travel support

# Bringing Clinical Medicine into Biomedical Engineering

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## 3. HHMI Med-into-Grad Scholars

Changes in cerebral microcirculation in polycythemia vera (BME and medicine)

Metastatic tumor cell migration in response to the physicochemical microenvironment (BME and Pathology)

Adhesion of circulating prostate tumor cells (BME and Medicine, Urology)

Time-resolved three-dimensional contrast-enhanced MR angiography of peripheral arteries (BME and radiology)

## Bringing Clinical Medicine into Biomedical Engineering

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1. *Core Concepts in Disease* – a new course for first-year graduate students
2. *Summer Immersion Term* – a clinical
3. *HHMI Med-into-Grad Scholars* – sustaining clinical collaborations

Biomedical engineers prepared for careers at the interface of engineering and medicine