Stanford India Biodesign Fellowship
What is Biodesign?

It’s all about Innovating Medical Devices

It’s NOT about
- Developing new drugs
- Pharmaceutical product
- Genetic research
- Biological or clinical research
Why India?

Rising Healthcare Spending

- Per Capita (USD)
- Healthcare Spending (Billions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Per Capita</th>
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<tr>
<td>2004</td>
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<td>2005</td>
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Why India?

The Promise

Abundant Talent: 250,000 Engineers, 20,000 Doctors annually

Growing appetite for disruptive cost effective innovations

Increasing Multi-Disciplinary Collaborations and Interactions
Supporters

Department of Biotechnology
Ministry of Science and Technology
Jan
Understand
Stanford
June
July
Live Project
Dec
AIIMS
Learning

Human Physiology

Prototyping & Product Realization

Intellectual Property & Regulatory Lectures

Biodesign Class
<table>
<thead>
<tr>
<th>Companies</th>
<th>Conferences</th>
<th>Organizations</th>
<th>People</th>
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<tr>
<td>bioimagene</td>
<td>TiEcon 2010</td>
<td>Bill &amp; Melinda Gates Foundation</td>
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<td>INTUITIVE SURGICAL</td>
<td>EPPIC</td>
<td>Entrepreneurial Design for Extreme Affordability</td>
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<td>SYNERGY</td>
<td>PROJECT H DESIGN</td>
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<td>NEW LEAF VENTURE PARTNERS</td>
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Biodesign Process

Identify
- Needs Finding
- Needs Filtering

Invent
- Concept Generation
- Prototyping

Implement
- Development Strategy
- Business Plan
Community Medicine Immersion
### Need Filters

- **Immobolising joints**
  - C-spine
  - Spine stabilization from paramedic to ED setting
- **sterile barrier**
  - Between provider's hands and patients
  - Advancing the catheter
  - Suture in order to reduce difficulty in manipulating the equipment
- **Blood diagnostics**
  - ABG levels
  - Reduce amounts of blood required
  - Discomfort to neonates with EKG leads
  - Diagnose traumatic arthotomies
  - Visualize the airway while doing intubation
  - ET tube in neonates
  - Correct positioning of ET tube
- **Ventilation**
  - Effective sealing of airway
  - Break and remove excess chest fluids
- **Intuitive Screening**
  - Transfer patients requiring successfully
  - Obtain arterial access
  - Reduce pain while injecting high volumes of fluid
  - Ensure accurate placement of PICC line
  - Imaging exposure to radiation on child
  - Heavy coat
  - MRI transport
  - Use U/S to visualize veins
  - Multiple pricks for arterial/venous
- **An easier way to monitor**
  - Flow of IV fluids
  - Formation of clots in the ECMO tubing
  - Appropriate dosing
  - Manage acid reflux
  - SIRS data numbers
  - Diagnose meningitis
  - Local anesthesia
  - X-rays on agitated patients
  - Regular disinfection of leads
  - Measure end tidal CO2
  - Laryngoscope
  - Wound cleaning
  - Oxygen mask
  - Gastroschisis
  - Transfer of information
  - Patient hard of hearing
  - Warming - hypothermic patient
  - Monitoring
  - Wound care
  - Labeling of meds
  - Septic arthritis
- **Setup/System**
  - Entering data into charts
  - Bilirubin therapy - Mask
  - Examine ears
  - Ultra sound machine
- **Patient transfer**
  - Unused sterile material wasted
  - Management of boxes
  - Movement of X-ray machine
  - Eyes hurting due to phototherapy
  - When ambulance moves in, it wastes precious time

<table>
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<th>456</th>
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<tbody>
<tr>
<td>Intuitive Screening</td>
<td>Impact, Market, Feasible outcome</td>
<td>Physician Feedback + Research</td>
<td>Team Priority</td>
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</table>
Brainstorm
Concept Development

Hearing Screening

electrodes

Base Station
Prototype
Implement

Financial Modeling
Funds Forecasting
Research Strategy
Marketing Strategy
Clinical/Regulatory Strategy
Ethical Considerations
Management Planning
Business/Project Plan
What’s next?

Launch project (perhaps…)

Launch your career as an innovator!
Enabling Medical Technology Innovation

Photo Courtesy: National Geographic, Jamkhed, Maharashtra State, India
Who may apply?

- Engineering
- Design
- Medical
- Business

...but not limited to!
Web site

http://biodesign.stanford.edu/bdn/india/

Contact us:

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Questions?