Technology Transfer at the National University of Singapore

Lily Chan, PhD
CEO, NUS Enterprise
Tech Transfer in Public Institutions – challenges

Motivations for tech transfer:
- Develop practical applications from results of scientific research
- Promote exchanges between industry and academics and research
- Generate economic benefits to the community
- Generate revenues from licensing and spin-outs

BUT
- Tech transfer is a long-term investment
- Money is required to build an IP portfolio and to build tech transfer competence and contacts
- US experience shows breakeven only after >8 – 10 years
- Tech Clusters take decades to reach critical mass
- Government or other investing entities must invest and sustain investment to realise economic benefits
Singapore Public Institutions with Tech Transfer Activities

- **A*STAR (Agency for Science, Technology & Research)**
  (i) BMRC (BioMedical Research Council)
    - GIS (Genome Institute of Singapore)
    - IMCB (Institute of Molecular and Cell Biology)
  (ii) SERC (Science and Engineering Research Council)
    - DSI (Data Storage Institute)
    - ICES (Institute of Chemical and Engineering Sciences)

- **IHL (Institute of Higher Learning)**
  (i) NUS (National University of Singapore)
  (ii) NTU (Nanyang Technological University)
  (iii) SMU (Singapore Management University)
  (iv) Polytechnics
The NUS way -
NUS: Strategic Thrusts

- Education
- Research
- Enterprise
- Globalisation
Mission

(i) Injecting an enterprise dimension to NUS teaching and research involving students, staff and alumni

(ii) Creating an environment conducive for “would-be” entrepreneurs
# What are the components?

<table>
<thead>
<tr>
<th>Experiential Education</th>
<th>Industry Engagement &amp; Partnerships</th>
<th>Entrepreneurship Support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOC / iLEAD:</strong></td>
<td><strong>ILO</strong></td>
<td><strong>NEC</strong></td>
</tr>
<tr>
<td>Immerse NUS students in</td>
<td>Promote the transfer of</td>
<td>Providing entrepreneurial</td>
</tr>
<tr>
<td>leading entrepreneurial and</td>
<td>University-generated</td>
<td>support by providing the</td>
</tr>
<tr>
<td>academic hubs around the</td>
<td>knowledge and technology</td>
<td>‘software’ (people, knowledge,</td>
</tr>
<tr>
<td>world with the aim of</td>
<td>to industry</td>
<td>nurturing) and ‘hardware’</td>
</tr>
<tr>
<td>nurturing tomorrow’s</td>
<td></td>
<td>(incubator space, network,</td>
</tr>
<tr>
<td>global entrepreneurs.</td>
<td></td>
<td>funding)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• work &amp; study in new</td>
<td>• Protect, manage &amp; commercialise</td>
<td>• Mentoring &amp; nurturing</td>
</tr>
<tr>
<td>environment &amp; culture</td>
<td>IPs</td>
<td>• Incubator &amp; Venture</td>
</tr>
<tr>
<td>• 1st hand insights into</td>
<td>• industry connection &amp;</td>
<td>support</td>
</tr>
<tr>
<td>the mechanisms of a</td>
<td>partnerships</td>
<td>• Networking &amp; outreach</td>
</tr>
<tr>
<td>start-up</td>
<td>• pro-actively engage</td>
<td>• pro-actively develop spin-</td>
</tr>
<tr>
<td></td>
<td>faculty and R&amp;D cluster</td>
<td>-offs</td>
</tr>
<tr>
<td>• study in a prestigious</td>
<td></td>
<td>• Monitor and benchmark</td>
</tr>
<tr>
<td>overseas university</td>
<td></td>
<td>through research on</td>
</tr>
<tr>
<td>• network with renowned</td>
<td></td>
<td>entrepreneurship</td>
</tr>
<tr>
<td>entrepreneurs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Continuing Education - NEX
Experiential Education

- NUS Overseas Colleges (NOC)
- iLead
Experiential Education
NUS Overseas Colleges

NUS College in Silicon Valley, USA
(2002)
Study at Stanford & work in the innovation
“habitat”
≈

NUS College in Bio Valley, USA
(2003)
Study at UPenn & work in the US’ pharma hotbed
≈

NUS College in Shanghai, China
(2004)
Study at Fudan & work in China’s commercial
hub
≈

NUS College in Stockholm, Europe
(2005)
Study at KTH/SSE & work in
Europe’s No.1 IT hub
≈

NUS College in Bangalore, India
(2006)
Study at IISc & work in India’s high-tech hub
iLead (innovative Local Enterprise Achiever Development)

- An opportunity for students to intern at innovative companies and be exposed to the entrepreneurial challenges in Singapore
- Two-week overseas study mission at the end of attachment
- Aims to cultivate entrepreneurial mindset, develop leadership & management skills, gain insight into the working of the business world, and provide opportunities to learn from entrepreneurial leaders
- A pilot intake of up to 20 interns will commence in January 2008.
## What are the components?

### Experiential Education

**NOC / iLEAD:** Immerse NUS students in leading entrepreneurial and academic hubs around the world with the aim of nurturing tomorrow’s global entrepreneurs.

- work & study in new environment & culture
- 1st hand insights into the mechanisms of a start-up
- study in a prestigious overseas university
- network with renowned entrepreneurs

### Industry Engagement & Partnerships

**ILO**

Promote the transfer of University-generated knowledge and technology to industry

- Protect, manage & commercialise IPs
- industry connection & partnerships
- pro-actively engage faculty and R&D cluster

### Entrepreneurship Support

**NEC**

Providing entrepreneurial support by providing the ‘software’ (people, knowledge, nurturing) and ‘hardware’ (incubator space, network, funding)

- Mentoring & nurturing
- Incubator & Venture support
- Networking & outreach
- pro-actively develop spin-offs
- Monitor and benchmark through research on entrepreneurship

### Continuing Education - NEX
**Industrial Engagement and Partnership**

**Industry Liaison Office**

**Industry Relations**
- Work closely with faculties, and schools and familiar with research projects, expertise, and facilities
- Main contact for Industry
- Network with Industry to identify research collaborations
- Negotiate research collaborative agreements

**IP Management**

- Evaluate
- Commercialising
- Exploit
- Protect

**CREATING IP**
Industry Engagement and Partnership
Industry Liaison Office

IP Management & Licensing

• Receives more than 100 invention disclosures yearly from NUS staff and students
• Since 1992:
  - 1,069 invention disclosures received
  - 1,546 patents filed, of which 385 patents granted
  - 169 licenses executed

Industry Relations

• Negotiates more than 100 agreements yearly
• Concluded more than 700 industry collaboration research projects from 2000
What are the components?

**Experiential Education**

**NOC / iLEAD:**
Immerse NUS students in leading entrepreneurial and academic hubs around the world with the aim of nurturing tomorrow’s global entrepreneurs.

- work & study in new environment & culture
- 1st hand insights into the mechanisms of a start-up
- study in a prestigious overseas university
- network with renowned entrepreneurs

**Industry Engagement & Partnerships**

**ILO**
Promote the transfer of University-generated knowledge and technology to industry

- Protect, manage & commercialise IPs
- industry connection & partnerships
- pro-actively engage faculty and R&D cluster

**Entrepreneurship Support**

**NEC**
Providing entrepreneurial support by providing the ‘software’ (people, knowledge, nurturing) and ‘hardware’ (incubator space, network, funding)

- Mentoring & nurturing
- Incubator & Venture support
- Networking & outreach
- pro-actively develop spin-offs
- Monitor and benchmark through research on entrepreneurship

**Continuing Education - NEX**
Entrepreneurship Support

NUS Entrepreneurship Centre (NEC)
Providing Entrepreneurship Support

To nurture the spirit of entrepreneurship & innovation among the NUS community, and to advance knowledge of technology venturing practice through education, research & outreach.
## Entrepreneurship Promotion Framework

<table>
<thead>
<tr>
<th>Target Groups</th>
<th>Entire NUS Community of Students, Professors &amp; Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Those interested in learning activities (Students taking Entrepreneurship courses, workshops)</td>
<td>New Start-Ups by NUS Students, Professors &amp; Alumni</td>
</tr>
<tr>
<td>Existing NUS Start-Ups, Pre-external Funding</td>
<td>Autonomous Spin-offs</td>
</tr>
</tbody>
</table>

### Key Nurturing Role

- Create awareness & Evangelize interest
- Support Pursuit of interest
- Catalyze & Incubate Start Up
- Mentor & Graduate Spin-offs
- Research Collaboration & Consulting

### Activities

- Techno-Venture Forum
- Experience-based Learning Programs (e.g. Internship)
- R&D collaboration, tech licensing
- Introductory Course on Entrepreneurship
- NOC, iLead
- StartUp@Singapore
- Technop. Minor Program
- Workshops for Professors on IP, Venture format, etc.
- Mentorship Program
- Incubators
- Research on Spin-offs
- Fund Support Program: ETDF –FUSE, SEEDS, MDA
- Continuing Education

---

NUS Enterprise
8 October 2007
MOZAT is a mobile solutions provider, dedicated to developing mobile communications solutions that mobilize the future for business organizations and professionals.

- Founded in 2003 by 2 PhD students
- Funded by NVSF and EDB SEEDs
- Microsoft Enterprise Mobile Partner
- 2004 APICTA (Asia Pacific ICT Awards) winner
NUS-Funded Start-Up

MXR (MiXed Reality) provides interactive learning to all levels of education, by specializing in emerging, cutting-edge technology.

- Founded in 2002 by 2 NUS researchers
- Funded by FUSE
- Have global partners
- Founders conferred the title of ““Lifetime Fellow” into the ranks of the Education session of World Technology Network, World Technology Award 2004 sponsored by Microsoft, NASDAQ, TIME and CNN
BioMers Pte Ltd is a medical device company with an initial focus on the orthodontic treatment market.

- Incorporated in 2005
- Funded by Fuse
- The company’s first products are patent pending translucent brackets and arch wires for orthodontic market.
- Patents filed in the United States, Canada, Europe (EPO) and Singapore.
- Worldwide exclusive licensing rights to these patents from the National University of Singapore.