Technology transfer in a Malaysian University: UPM’s Experience

Submitted by: UPM
Technology transfer in a Malaysian University: UPM’s experience

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Universiti Putra Malaysia (UPM)

Contents

• General introduction to UPM
• Structure & functions of TTO
• UPM’s success in TT
• Philosophy for success in TT
• IP management
• Modes for TT & opportunities
• Challenges & strategies
UPM Faculties

- Agriculture
- Biotechnology & Biomolecular Sciences
- Computer Science & Information Technology
- Design & Architecture
- Economics & Management
- Educational Studies
- Engineering
- Environmental Studies
- Food Science & Technology
- Forestry
- Human Ecology
- Medicine & Health Sciences
- Modern Languages & Communication
- Science
- Veterinary Medicine
- Total: 16

R&D Institutes

1. Inst. of Bioscience (IBS)
2. Inst. of Advanced Technology (ITMA)
3. Inst. for Mathematical Res. (INSPEM)
4. Inst. of Agri. & Food Policy Studies (IKDPM)
5. Inst. of Trop. Agriculture
6. Inst. of Trop. Forestry & Forest Products (INTROP)
7. Inst. of Social Science Studies (IPSAS)
8. Halal Product Res. Inst. (HPRI)
9. Institute of Gerontology (IG)
University information

Academic staff No. 1,492
Student No. 30,000

Research Funding 2006-2010

<table>
<thead>
<tr>
<th>Projects Nos.</th>
<th>US$</th>
</tr>
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<tbody>
<tr>
<td><strong>Public Funds</strong></td>
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<tr>
<td>ScienceFund</td>
<td>523</td>
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<tr>
<td>Fundamental</td>
<td>608</td>
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<tr>
<td>RUGS</td>
<td>876</td>
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<td>Top Down Nat. Biotech.</td>
<td>25</td>
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<tr>
<td>Technofund</td>
<td>11</td>
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<td>MTDC</td>
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</tr>
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<td>Others</td>
<td>6</td>
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<td><strong>Private Funds</strong></td>
<td></td>
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<tr>
<td>FELDA</td>
<td>28</td>
</tr>
<tr>
<td>MPOB</td>
<td>17</td>
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<tr>
<td>Others MTSF, GABA, Etc.)</td>
<td>45</td>
</tr>
<tr>
<td><strong>Inter. Funds</strong></td>
<td></td>
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<tr>
<td>International</td>
<td>59</td>
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</table>

Total: US$81.1m
Organizational Options for Tech. Transfer Office

VC

DVC Student Affair
DVC Res. & Innovation
DVC Academic Affairs

Research Management Centre (RMC)
Innovation & Commercialisation Centre (ICC)
- TT office

ICC ORGANISATIONAL STRUCTURE - UPM

DVC Research & Innovation

1 April 2006

Director

General Admin
Currently 29 staff

Deputy Director Commercialisation
Deputy Director Promotion /Training
Deputy Director Intellectual Property & Contract research

IT
Legal
**TTO Divisions & functions**

**Commercialisation**
- Planning
  - Business planning
  - Business develop
  - Market research
  - Garage/incubators
  - Issues/Policy
- Commercialisation
  - Entrepreneurship
  - Marketing
  - ‘Spin-off’ Company
  - Commer grant
  - Monitoring project/Co.

**Promotion/Training**
- Promotion/Training
  - Promotion
  - Roadshow
  - Training
  - Public retlation
  - Branding
  - Matchmaking

**IP/Contract Research**
- Intellectual Property
  - Patent
  - Trademark
  - Plant variety
- Com Dev. Research
- Contract Research
- Technology transfer

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**Patent 2009**

**Patents Granted** 53

**318 Patents Pending**

**Filed in foreign countries** 98

- China
- European
- India
- Indonesia
- Japan
- Philippine
- Singapore
- Switzerland
- Thailand
- Taiwan
- United Kingdom
- United States
- Vietnam
STATISTICS ON PATENT FILED (2000~2009)

- **Engineering**: 30%
- **Agriculture**: 2%
- **Biotechnology & Biomolecular Sciences**: 19%
- **Food Sciences**: 18%
- **Science**: 13%
- **Veterinary Medicine**: 6%
- **Design and Architecture**: 1%
- **Computer Science**: 1%
- **Medicine & Health Science**: 10%
- **Other categories**: 25%

9/25/2010

Commercialisation

20 Products/technologies

Gross Sale

>RM28 ($8.57 million)
ZAPPA® PLUS

- Provide vigorous growth to rice seed grown under aerobic & anaerobic systems
- Increases root growth (130%) & shoot growth (62%)
- Increases Paddy Yield between 40 - 57%
- Conserves water usage
- Reduces diseases, & increases seed purity

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**Rank top out of 16 others products!**

**BTS (MT/ha) Tahun 1st (35-47 Bulan)**

AJIB

Trials done by RISDA

<table>
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<tr>
<th>Fertilizer Types</th>
<th>BTS (MT/ha)</th>
<th>Control</th>
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<td>9</td>
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<td>T10</td>
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<td>8</td>
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<tr>
<td>T5</td>
<td>11</td>
<td>8.20</td>
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<tr>
<td>T11</td>
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<td>8.46</td>
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<td>9</td>
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<td>MEAN</td>
<td>8.81</td>
<td>7.50</td>
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<td>7.68</td>
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<td>7.94</td>
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<td>T16</td>
<td>9.58</td>
<td>8.46</td>
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<tr>
<td>T8</td>
<td>9.86</td>
<td>8.72</td>
</tr>
<tr>
<td>T12</td>
<td>9.14</td>
<td>8.68</td>
</tr>
</tbody>
</table>

21% increase
FAST TARGET™
G.S: RM 400,000

StellarLac™
OS: RM 200,000

Fiber Duplexer Module
OS: RM 150,000

Stone Mastic
OS: RM 120,000

MRT Latexometer™
S: > RM 30,000

5 UPM JV /
spin off Co.

Cattle Brooding
Co: Putra Al-Mawashi Livestock (M) S.B
A.P. Dr. Wahid Haron

CNG Composite Tanks
Co: Advanced Composite Eng S.B.
-P.Dr. Fakhru’l Razi
-Dr. Mohd. Amran

High Quality Orchid
Co: Orchid Life S.B (OLSB)
-P.Dr. Maziah Mahmood

Satiri Superdwarf
Co: Satiri S.B.
A.P. Dr. Mohd Said Saad

Edu-Enzyme Assay
Co: Xeno Lab S.B.
A.P. Dr. Mohd Yunus Shukor

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How do we do it in UPM?

Good understanding of our clients!
Researcher’s role

- Supervisor
- Meetings
- Seminars
- Stressed
- Research
- Consultancy
- Services
- Commercialization!

No experience in commercialization or entrepreneurship
Training researchers on all aspects of commercialization including IP protection

Awareness

- Still only focus on publishing papers
- Importance of commercialization?
- Contribution to nation building?
- Income they can generate for themselves & team!

IP & TT is a new culture in Univ.

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**Awareness campaigns**

**Top management**

- Vice Chancellor
- Deputy Vice Chancellors
- Registrar
- Bursar
- Deans
- Deputy Deans

Involve the total enterprise!

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**Awareness campaigns**

- All academic staff
- Road show to all faculties & Institutes

Get a feedback

Motivation!

Role of TMO to synergise with researchers

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Training – Technology Transfer

- Selected academic staff
- Have a patent or potential candidates
- At Univ. & PRIs

Building core of knowledgeable group

Explain Business Philosophy

In Business

IF
You don’t
INNOVATE
&
COMMERCIALISE
You will
EVAPORATE

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KASS Int. Sdn Bhd
To support business & industry

• Manufacturers need a continuing flow of new products
• Co. need new products for growth
• Product life cycles are getting shorter all the time

Industries need new technologies

❖ Private sector still keep looking for technologies from advance countries
❖ We have world class scientist & innovations
❖ We need to be proactive in promoting our innovations

Engine for future growth
Rich in Biodiversity

- Our natural resources
  - several commodities
  - byproducts
  - medicinal value
- Some being patented by foreigners in other countries

Loss to the nation

Globalization

Have to compete with the rest of the world!

Cannot be complacent or else we will be dependent on other forever!
Wealth Creation & Nation Building

Univ. Innovation Model

- Massachusetts Institute of Technology (MIT) best model for innovation:
  - MIT’s charter directs Institute to **Wealth Creation**
  - Over **100 technology licenses**/ year
  - About **20 companies** founded/ year
  - > **4000 companies** founded overall
  - Involvement in annual sales **$230B**
  - Created **1,100,000 jobs**
Past main research output

- Journal papers
- Presentations at seminars – national & international meetings
- Human resource development
  - MSc, PhD

Additional research output

More

- Patents
- Lab scale technologies
- Marketable products (prototype)

Develop IP & technology transfer culture

Paradigm shift required
TTO must have the expertise

Have the right expertise!

Policy making & procedures

- Introduce policy, draw up strategies & guidelines for TT
- Provide incentives
- Make it easy for academic staff to commercialize technologies

Synergize with research staff & private sector to commercialize technologies
Incentives for researchers!

- RM5,000 for filing patent
- RM10,000 on receiving patent certificate
- RM500 on disclosure

Incentives for researchers!

- RM500 for Industrial design (Submission)
- RM1,500 after Registered
- RM2,000 for copyright (software)
- RM2,000 trademark for commercialised product
- Provide equity in joint venture company
Disclosure/ Evaluation of technologies

Meeting every 2 weeks

Meetings: i) Learn technology
ii) Approve/reject patent/copyright/TS
iii) Fine tune
iv) Add financial aspects

Match making with business partner

Meetings with entrepreneur & researcher until deal is finalised – MoA
i) License deal
ii) IP assignment
iii) Application for grants “Technofund”
iv) Formation of spin-off Co.

>5-10 meetings – a slow process
Commercialisation/Negotiation/Match Making Process

- Researcher presentation to ICC
- Client presentation to ICC
- Several rounds of meeting with client & researcher until deal is final
- Researcher presentation to potential client & ICC
- Receive client offer – meeting with researcher
- Final Univ. approval

Final approval 1) Management 2) Board

IP Protection: Appropriate Strategies & Options
Intellectual Property
Hidden treasurers!

Engine for future growth

Era of I Economy

Confidentiality

- Panel members sign a non-disclosure agreement (NDA)
- Documents only distributed during meeting
- Members cannot removed documents from meeting room
- Documents are kept in a safety cabinet

No circulating of documents!
IP Management

Patent before participation in exhibitions/seminars & publishing

Protect the technology!

IP Management

Non disclosure agreement :-

- Students
- Evaluators

New guidelines!
Modes for Technology Transfer

- Royalty 2-10%
- Formation of spin-off company
- Technical R&D support Consultancy
- Selling
- Licensing
- Patent/Tech.
Equity in Spin-Off Company

- Assist in getting funds for spin-off company
- No financial contribution
- Contribution of expertise

Equity in Company

Sell or License ↔ Consultancy

- 5-10% University Holdings
- 10-40% Researcher/Technical director/Advisor
- 40-70% Entrepreneur

Negotiable
Equity for researchers

- Benchmark of success with researcher’s involvement
- Security for entrepreneur
- Sense of belonging for researcher – thus commitment

Equity for researchers

- Constant renewing of technology – forefront in market
- Assurance of quality control of product in the market
Distribution of Income

Distribution of income generated from commercialisation

- Researcher/Inventor 75%
- University 25%

Opportunities for Funds

- Collaboration with industry
- Patent Tech Transfer
  - Further product development
  - Product development
    - New benefit
    - Safe
  - CRDF 1
  - CRDF 2-4
- BioTech Corp
- Garage fund
- Techno fund
- Commercial Production
- Market Development
- Product Sales
- Product Market Opportunities
- Feasibility study
CHALLENGES

Private sector’s perception

Private sector skeptical of local Technologies
Work smart to win them

Convince the industry
World class expertise & technologies

Win - Win situation = smart partnership

Importance of a right partner

- Finding the right collaboration/business partner is an important process
- Wrong partner can make life miserable
- Sometimes it worked so well that partners ended up getting married
Going global

- Work with global partners
- Local market small & non sustainable

New culture & shy scientists

- The TT/ commercialization/ business is a new culture in University
- Scientists not aggressive in marketing themselves & their products
Slow

- Approval from various levels
  - Legal
  - Management

For private sector – time is money

Unclear policies

- Unpredictable changes
- New leaders – different vision

Private sector – loses trust with the institution
Patent difficult to evaluate

Patent – non-tangible asset, evaluation is difficult

E.g.
- 1st offer RM200,000
- Final offer RM 4 million
  - + 20% equity to researcher
  - + 5% equity to UPM
  - + Consultancy

Right expertise to negotiate

Challenges

- Disclosure of critical technology knowledge can induce misconduct
- Research is a long term commitment – return on investment is extended

Scientist very found of telling everything to everybody!
Challenges on joint ownership

- IP ownership – joint research programs
- Depending on the contribution
  - Negotiate for full ownership
  - If joint 50:50 (if possible assigned to Univ. for commercialisation)

Sign non disclosure agreement (NDA)

Branding

- Promote the institution as the inventor – increases credibility & reliability
- Create impact on customers
- Improve chance of getting venture capital
- Differentiate you from your competition
Nurturing clients

- Lab scale to market takes time to materialise (pilot scale)
- Close monitoring on progress
- Provide assistance when necessary
- Use of incubators & other facilities
- Assistance in seeking funds
- Provide guidance from expertise available on campus/institution

Strategies for Successful Commercialization

- Identify selected technologies for up-scaling
- Promotion & marketing activities
- Links with industries
- Evaluate possible investors
- Protection of IP rights
- Legal support e.g. ownership of IP & documentation