Institutional strategies for Horizon 2020?

Halle-Wittenberg, 23.06.2016

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KU Leuven?

### Comprehensive university

<table>
<thead>
<tr>
<th>Field</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Health</td>
<td>Medical Technologies</td>
</tr>
<tr>
<td>Energy, Matter, Materials</td>
<td>Nature Unlimited</td>
</tr>
<tr>
<td>Arts, Religion, Culture</td>
<td>Economy, Law, Society</td>
</tr>
<tr>
<td></td>
<td>Human Behaviour</td>
</tr>
<tr>
<td></td>
<td>Bio-sciences &amp; Environment</td>
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<tr>
<td></td>
<td>Manufacturing &amp; ICT</td>
</tr>
</tbody>
</table>

### Global THE ranking

“KU Leuven is Europe’s most innovative university”

Reuters, June 14, 2016

<table>
<thead>
<tr>
<th>2015</th>
<th># (% international)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>56,659 (17%)</td>
</tr>
<tr>
<td>Academic staff</td>
<td>1,946 (8%)</td>
</tr>
<tr>
<td>Research staff</td>
<td>8,316 (37%)</td>
</tr>
<tr>
<td>PhD degrees</td>
<td>796 (40%)</td>
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</tbody>
</table>

| Total operating revenue 2014 | 933 M€ |
| Research expenses 2014       | 426 M€  |
| Industry collaboration       | 24%    |
| International funds          | 9%     |
| FP7:                         | 551 projects       |
| Horizon 2020:                | 148 projects       |
| License income 2015          | 100 M€            |
|                            | 264 M€            |
|                            | 86 M€             |
“Europe’s most innovative university”

1. KU Leuven
2. Imperial College
3. Cambridge
4. EPFL
5. TU Munich
6. Erlangen Nuremberg
7. TU Delft
8. Oxford
9. LMU Munich
10. Zurich

Parameters:
- Patent volume & success
- Patent citations
- Collaborations with industry (publications, citations, share)

http://www.reuters.com/article/us-innovative-stories-europe-idUSKCN0Z00CT
KU Leuven’s mission?

To be (at) the heart of the knowledge triangle

- Recruit the best researchers
- Perform the best science
- Educate the best students, scientists & entrepreneurs
- Create value & transfer knowledge
- Collaborate with society & industry
Ambition & ‘performance’ in Europe

Performing excellent science

Training the best young researchers

Collaborating with end-users, creating value

So far (2007-2015), we are managing:

- 90 ERC grants
- 193 MSC actions (incl. 94 ITN’s)
- 562 FP7 + 148 H2020 projects in total

# 6 in HEI ranking for # FP contracts
Collaboration with Germany (I)

Entities with >10 KUL-DE FP7+H2020 collaborations

- FRAUNHOFER
- MAX PLANCK
- RWTH AACHEN
- JWG FRANKFURT AM MAIN
- TU MUNICH
- LMU MUNICH
- KIT
- MH HANNOVER
- UNIVERSITAET STUTTGART
- CHARITE BERLIN
- TU DARMSTADT
- ALU FREIBURG
- EKU TUEBINGEN
- RKU HEIDELBERG

Collaborations FP7+H2020 / country

- DE; 928
- UK; 760
- FR; 585
- IT; 591
- NL; 501
- BE; 355
- CH; 237
- SE; 218
- AT; 199
- other; 1429
Collaboration with Germany (II)

On average 1.5 German partners collaborate on research projects with KU Leuven.
Strategies for Horizon 2020 *

1. Leveraging internal funds (competition)
2. Favoring intersectoral collaboration
3. Engaging ‘special forces’
4. Creating critical mass
5. Establishing ‘dynamic’ support

(*) for success in society at large
1. Internal funds as leverage (I)

KU Leuven research expenses in 2015: **455 M€**

20% internal

80% external
Budget breakdown 5 Flemish univs

Operational Subsidies

- KULeuven: 37%
- UGent: 33%
- UAntwerpen: 14%
- VUBrussel: 12%
- UHasselt: 4%

Parameters:
- 55% Education
- 45% Science (capacity)
  (paying for salaries of permanent staff)

Policy area: Education and Training

Special Research Fund BOF

- KULeuven: 43%
- UGent: 32%
- UAntwerpen: 10%
- VUBrussel: 9%
- UHasselt: 3%

Parameters:
- ‘Excellence’ in Science (output-driven)
  - PhD degrees
  - Publications / Citations
  - Internationalisation and diversity

Policy area: Economy, Science and Innovation

Industrial Research Fund IOF

- KULeuven: 47%
- UGent: 31%
- UAntwerpen: 9%
- VUBrussel: 9%
- UHasselt: 4%

Parameters:
- ‘Excellence’ in Innovation (output-driven)
  - Patents, spin-offs
  - Industrial contracts
  - European R&I projects

Policy area: Economy, Science and Innovation
1. Internal funds as leverage (II)

KU Leuven research expenses in 2015: 455 M€

20% internal leverage 80% external

Bottom-up, no thematic allocation

Competition, international peer-review plus independent research council

Categories of funding:
- C1: basic research
- C2: socio-econ impact on long-term
- C3: short-term socio-econ impact

40% national
9% international (EU)
24% private sector
7% other
2. Favoring intersectoral collaboration

Successful Technology Transfer Office
KU Leuven Research & Development (LRD) founded in 1972

- > 110 spin-offs
- ± 200 invention disclosures / year (586 active patent families)
- > 1,700 new agreements for contract & collaborative research / year
- 2015 license income: 100 M€

Examples:

3/4 professors have contracts through LRD

lrd@kuleuven.be – http://lrd.kuleuven.be
Leveraging investments in spin-offs

Investments in spin-offs 2005-2014

KU Leuven: 9,069,968 Euro
GFF: 16,196,024 Euro
derden: 760,410,680 Euro

GFF = Gemma Frisia VC Fund – “derden” = third parties
3. ‘Special forces’: knowledge brokers

37 IOF knowledge brokers bridge research results with end-users

KPI’s include EU project participation
4. Creating critical mass: networks

“CELSA” alliance
BME
Charles
CVUT
ELTE
Ljubljana
KU Leuven
Semmelweis
Vision2020: the Horizon network

The Horizon Network

Vision2020 Health Helix

Therapeutic innovation in the EU: An opportunity to strengthen R&D&I competitiveness

Contacts: Dr. Frauke Christ, Chair of the Vision2020 Health Helix:
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Mr. Abdul Rahim, Director of Vision2020:
abdul@2020visionnetwork.eu

End of Oct. 2016: Health partnership event in Ljubljana
4. Critical mass: multi-campus university

Regional cooperation of KU Leuven campus and university colleges
Driver of regional innovation, local collaboration with companies
5. EU research support team

- **Research Coordination Office (DOC)**: idea→proposal, stimulate-inform-support
- **Tech. Transfer Office (LRD)**: proposal→project, advice-support, project→post-project, support-monitor-report
- **Finance dep.**:
  - Decentral project developers
  - Central & decentral project managers
5. Support: strategic use of incentives

- **Leverages**: internal funds + assessments
- **Vouchers**: preparatory funding + travel grants
- **Salary top-ups**: ERC
- **Seal of Excellence**: runners-up funding
- **Empowerment (& autonomy)**: overheads
5. **Dynamic support? adapt or perish...**

e.g. SSH: lower participation & success rate ⇒ optimise support

*Graphs showing participation rates and success rates for different fields.*

*BMS: biomedical sciences; HSS: humanities & social sciences; SET: science, engineering & technology (KU Leuven Science Groups)*
Strategies for innovation (conclusion)

1. Leveraging internal funds (competition)
2. Favoring intersectoral collaboration
3. Engaging ‘special forces’
4. Creating critical mass
5. Establishing ‘dynamic’ support
Horizon2020 > Heaven27 ? Budget!

€1 investment in LERU universities → €6 return

EC is expecting too much in project’s lifetime…

<table>
<thead>
<tr>
<th>TRL’s</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASIC PRINCIPLES OBSERVED</td>
<td>TECHNOLOGY CONCEPT FORMULATED</td>
<td>EXPERIMENTAL PROOF OF CONCEPT</td>
<td>TECHNOLOGY VALIDATION IN LAB</td>
<td>TECH VALIDATED IN RELEVANT ENVIRONMENT</td>
<td>DEMONSTRATION IN RELEVANT ENVIRONMENT</td>
<td>DEMONSTRATION IN OPERATIONAL ENVIRONMENT</td>
<td>SYSTEM COMPLETE AND QUALIFIED</td>
<td>SUCCESSFUL MISSION OPERATION</td>
<td></td>
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Impact the EC expects

‘Impact’ the EC gets

How it could work

Research

Track to innovation

Innovation

gap…

BOTTOM-UP !  TRULY OPEN COMPETITION !  SMALL SCALE !
Good luck !
FINALS

Belgium 2  Germany 1