The economics of innovation in the biomedical industry
MGT 403
Spring 2018

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Lecturer EPFL
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Debiotech and Lecturer EPFL

Class time
Monday – 16:15 – 19:00
MEB331

Objectives

To use ‘simple’ microeconomic principles to understand key issues in biomedical research and innovation (price formation in different types of market structures, central role of intellectual property rights, nature of competition, role of public policy, etc.).

To gain competences and knowledge in:

a) the economic aspects of R&D, innovation and competition in the pharma/biomedical industry
b) the nature of the so-called R&D productivity crisis and its impact on the organization and sustainability of the industry structures in this sector
c) the institutional and economic characteristics of successful biomedical innovation systems
d) the political decision making process to promote efficiency of therapeutic products from research to patients with a particular emphasis on the North-South issue.
e) The emerging trends in the organization of R&D and innovation in the biomedical sector
Calendar and outline

Section 1 – Microeconomics of biomedical innovation - fundamentals
19-02 – Dominique Foray - Innovation as an economic discovery process
26-02 – Dominique Foray – The value of innovation and how to capture it?

Section 2 – Principles of microeconomics: inside the toolbox!
5-03 – Alexander Mack - Principles 1 – demand and supply, elasticities, production theory, perfect competition, surplus
12-03 – Alexander Mack – Principles 2 – imperfect competition, monopoly
19-03 – Alexander Mack – Principles 3 – State intervention, public goods
26-03 – Alexander Mack – Principles 4 – Short run and long run production

Section 3 – Current revolution and emerging trends
09-04 - Laurent Dominique Piveteau - From closed to open innovation: the outsourcing of R&D in the US context
16-04 – Dominique Foray – Productivity crisis and a new revolution?
23-04 – Laurent Dominique Piveteau - AO in Switzerland : a model for the future?
30 -04 – Laurent Dominique Piveteau - Towards Uberisation…

Section 4 – Social innovation, global health
07-05 – Dominique Foray – Social innovation 1) neglected disease and 2) the role of AI in healthcare
14-05 – Dominique Foray – Access to innovation. Towards a new geography of innovation?
28-05 –Teamwork presentations

Course materials (PPT presentations) are posted to:
http://moodle.epfl.ch
**Grade**

Problem sets 1 & 2: out of 6  
Team work: out of 6  
Final exam: out of 12

**Modalities:**

Problem sets 1 and 2 (PS 1 and 2) will be posted on March 12\textsuperscript{th} and March 19\textsuperscript{th} respectively. Problem set 1 has to be handed in on March 19\textsuperscript{th} at the beginning of the course, and problem set 2 on March 26\textsuperscript{th} at the beginning of the course.

Teamworks will start on April 9\textsuperscript{th}. Each team will devote about 3 hours during the course to prepare a short presentation (max 5 slides) on a topic proposed by the professors. The work will be presented to the classroom during the final session.

The final exam covers the whole course. It will consist in both quantitative and qualitative questions.
## Assignment and Readings

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<td><strong>Innovation as an economic discovery procedure</strong></td>
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<td>26-02</td>
<td><strong>Main issues: value and appropriation</strong></td>
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<td>16-04</td>
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<td>28-05</td>
<td><strong>Team work presentation</strong></td>
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References

*Students are encouraged to read these documents as a complement to some of the lectures.*

**Weeks 1 to 6**


A. Atkinson, *Why life science innovation is politically ‘purple’ and how partisans get it wrong?*, ITIF, February 2016

A. Jaffe, *Economic analysis of research spillovers* (Parts 1 to 4)  

**Weeks 7 to 10**


I. Cockburn, “The changing structure of the pharmaceutical industry”, *Health Affairs*, vol. 23, 1, 2004  
DOI: 10.1377/hlthaff.23.1.10


**Week 11 to 13**

Barder, O., *Making markets for vaccines – ideas to action*, CGD Brief  
[http://www.cgdev.org/vaccine](http://www.cgdev.org/vaccine)


D. Cutler, “Where are the health care entrepreneurs?”, *Issues in Science and Technology*,  


Lanjouw, J. and Jack W., Trading up: how much should poor countries pay to support pharmaceutical innovation?, CGD brief

Lanjouw, J., Beyond TRIPS: a new global patent regime, CGD brief
www.iprsonline.org/icts/docs/cgdbrief003.pdf

Moon, S., “Powerful ideas for global access to medicines”, *the New England Journal of Medicine*, 2017

Moran, M., “A Breakthrough in R&D for Neglected Diseases: New Ways to Get the Drugs We Need”. *PLoS Med*

Munoz V., P. Gaulé, F. Visentin and D. Foray, “Can medical products be developed on a non profit basis?” *Science and Public Policy*, 2014

Sampat, B., “Research locally, diffuse globally? American Universities, patents and gobal public health”, *Journal of International Affairs*, vol.64, 1, 2010

Stiglitz, J., “Scrooge and intellectual property rights”, BMJ,
http://bmj.com/cgi/content/full/333/7582/1279

TRIPS wikipedia page
http://en.wikipedia.org/wiki/TRIPS

The Economist, *Push and pull: should the G8 promise buy vaccines that have yet to be invented?*
http://www.economist.com/node/5655331