

The economics of innovation in the biomedical industry

MGT 403
Spring 2019

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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

18-02 – Dominique Foray

Introduction to the course
The big picture: from innovation to prosperity

25-02 – Dominique Foray

Innovation as an economic discovery process
Today: great stagnation or brilliant revolution?

Section 2 – Principles of microeconomics: inside the toolbox!

4-03 – Alexander Mack

Principles 1 - demand and supply, elasticities, production theory, perfect competition, surplus

11-03 – Alexander Mack

Principles 2 – imperfect competition, monopoly

18-03 – Alexander Mack

Principles 3 – State intervention, public goods

25-03 – Alexander Mack

Principles 4 – Short run and long run production

Section 3 – Current revolution and emerging trends

01-04 - Laurent Dominique Piveteau

From closed to open innovation: the outsourcing of R&D in the US context

08-04 - Dominique Foray

Baumol disease and the new innovation trend in healthcare

15-04 - Dominique Foray

The economics of disruptive innovation

29-04 - Laurent Dominique Piveteau

AO in Switzerland: a model for the future?

06 –05 - Laurent Dominique Piveteau

Towards Uberisation...

Section 4 – Global health

13-05 – Dominique Foray

Neglected disease and access to innovative drugs

20-05 – Dominique Foray

Towards a new geography of innovation?

27-05 - tbd

Conclusions

Course materials (PPt presentations) are posted to:

<http://moodle.epfl.ch>

Grade

Problem sets 1 & 2: out of 6

Teamwork and short presentations in class: out of 6

Final exam: out of 12

Modalities:

Problem sets 1 and 2 (PS 1 and 2) will be posted on March 11th and March 18th respectively. Problem set 1 has to be handed in on March 18th at the beginning of the course, and problem set 2 on March 25th at the beginning of the course.

Teamwork and short presentations in class (section emerging trends).

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

Assignment and Readings

<i>Week</i>	<i>Date</i>	<i>Topic</i>	<i>Assignment</i>
1	18-02	<i>Fundamentals</i>	<i>Readings</i>
2	25-02	<i>Fundamentals</i>	<i>Readings</i>
3	04-03	<i>Microeconomics</i>	<i>Readings</i>
4	11-03	<i>Microeconomics</i>	<i>PS 1 online</i>
5	18-03	<i>Microeconomics</i>	<i>PS1 to be handed in PS2 online</i>
6	25-03	<i>Microeconomics</i>	<i>PS2 to be handed in</i>
7	01-04	<i>Emerging trends</i>	<i>Teamwork</i>
8	08-04	<i>Emerging trends</i>	<i>Readings</i>
9	15-04	<i>Emerging trends</i>	<i>Readings</i>
10	29-04	<i>Emerging trends</i>	<i>Teamwork</i>
11	06-05	<i>Emerging trends</i>	<i>Readings</i>
12	13-05	<i>Global health</i>	<i>Readings</i>
13	20-05	<i>Global health</i>	<i>Teamwork</i>
14	27-05	<i>Conclusions</i>	

References

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

Weeks 1 to 6

A.Dixit, *Microeconomics: A Very Short Introduction*, Oxford University Press, 2014.

Weeks 7 to 11

I.Cockburn, S.Stern and J.Zausner, “Finding the endless frontier: lessons from the life science innovation system for energy”, in Henderson and Newell, *Accelerating energy innovation – insights from multiple sectors*, NBER, Cambridge University Press

I.Cockburn, “The changing structure of the pharmaceutical industry”, *Health Affairs*, vol. 23, 1, 2004

DOI: 10.1377/hlthaff.23.1.10

F.Pamolli, L.Magazzini and M.Riccaboni, “The productivity crisis in pharmaceutical R&D”, *Nature*, vol.10, June 2011

J.Scannell, A.Blanckey, H.Boldon and B.Warrington, “Diagnosing the decline in pharmaceutical R&D efficiency”, *Nature Reviews*, vol.11, March 2012

D.Cutler, “Where are the health care entrepreneurs?”, *Issues in Science and Technology*, <http://issues.org/27-1/cutler/>

Weeks 11 to 13

Barder, O., *Making markets for vaccines – ideas to action*, CGD Brief

<http://www.cgdev.org/vaccine>

Conti A.M., Gaulé, P. and Foray, D., “Academic licensing: a European study”, CEMI Working paper, 2007-001

<http://cdm-it.epfl.ch/repec/cmi-wpaper/cemi-workingpaper-2007-001.pdf>

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

www.cgdev.org/files/2842_file_CGDbrief_pharmaceutical.pdf

Lanjouw, J., *Beyond TRIPS: a new global patent regime*, CGD brief

www.iprsonline.org/ictsd/docs/cgdbrief003.pdf

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

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>