The anatomy of bio-entrepreneurship and its status in Denmark

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Lecture overview

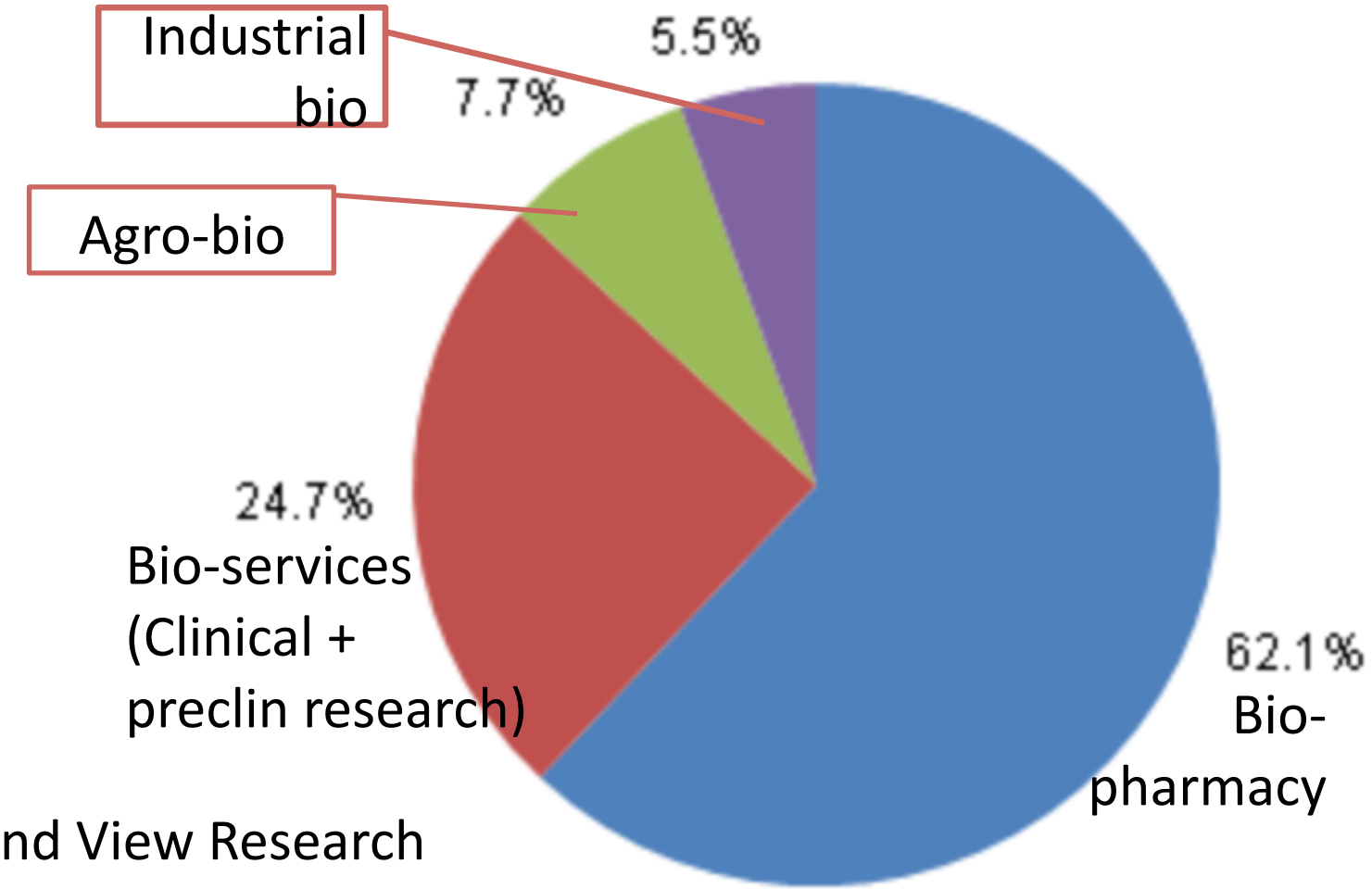
- Some challenges of definition and delimitation
- Overall structure of biobusiness
  - Main segments
  - Value chains
  - Geography
- The biotech firm
- Drivers of growth: The role of venture capital and other parts of bio-innovation systems
- Current status of Danish Biotech
- BBIP- The BioBusinmess and Innovation Platform: A short introduction

Global Biotechnology market 2013

Value: US$ 270. bn

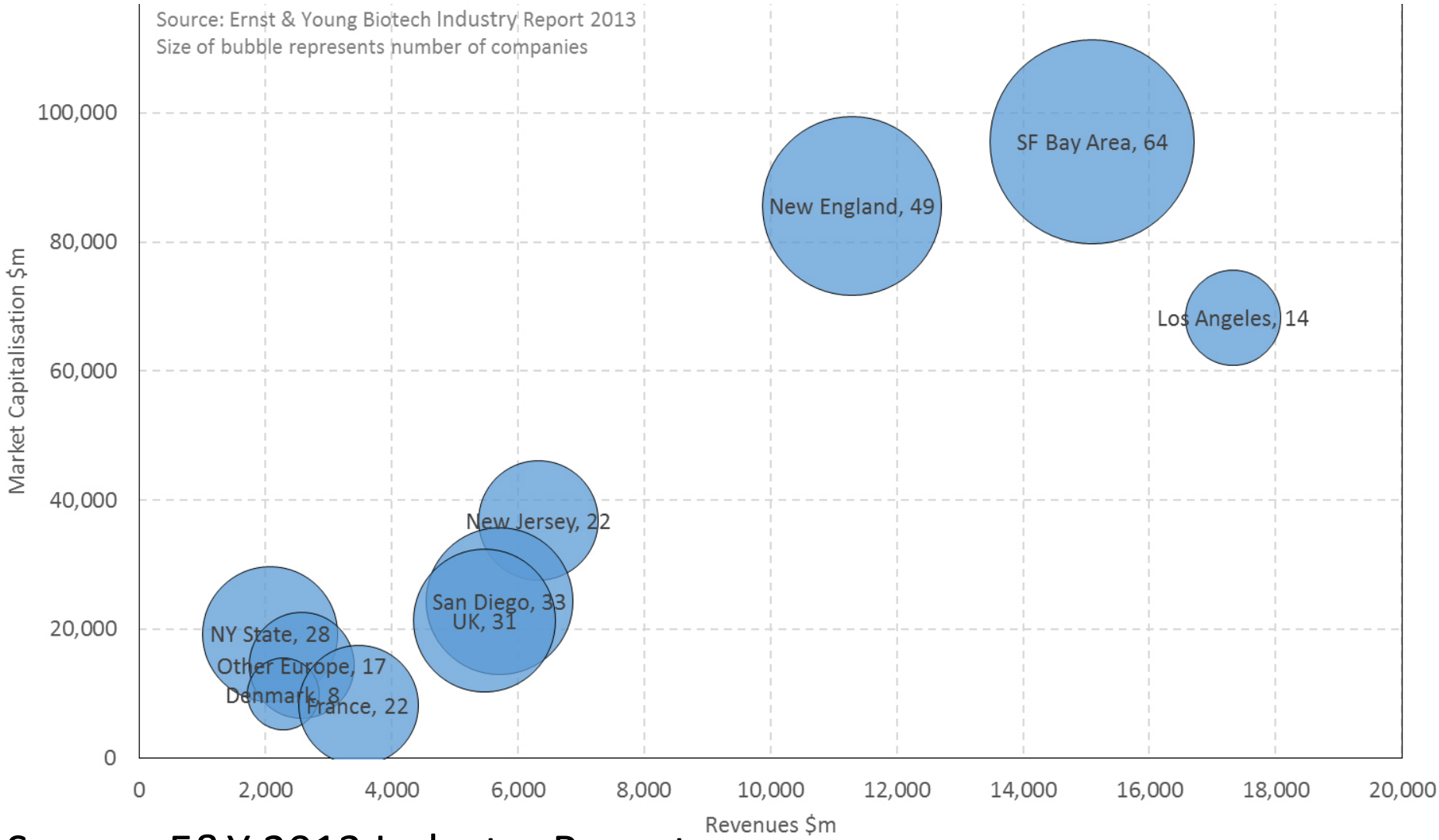
Expected CAGR to 2020: 12.3%.

Biotech applications by revenue 2013



Source: Grand View Research

Top 10 Biotech regions by Market Cap and revenues 2012



Source: E&Y 2013 Industry Report

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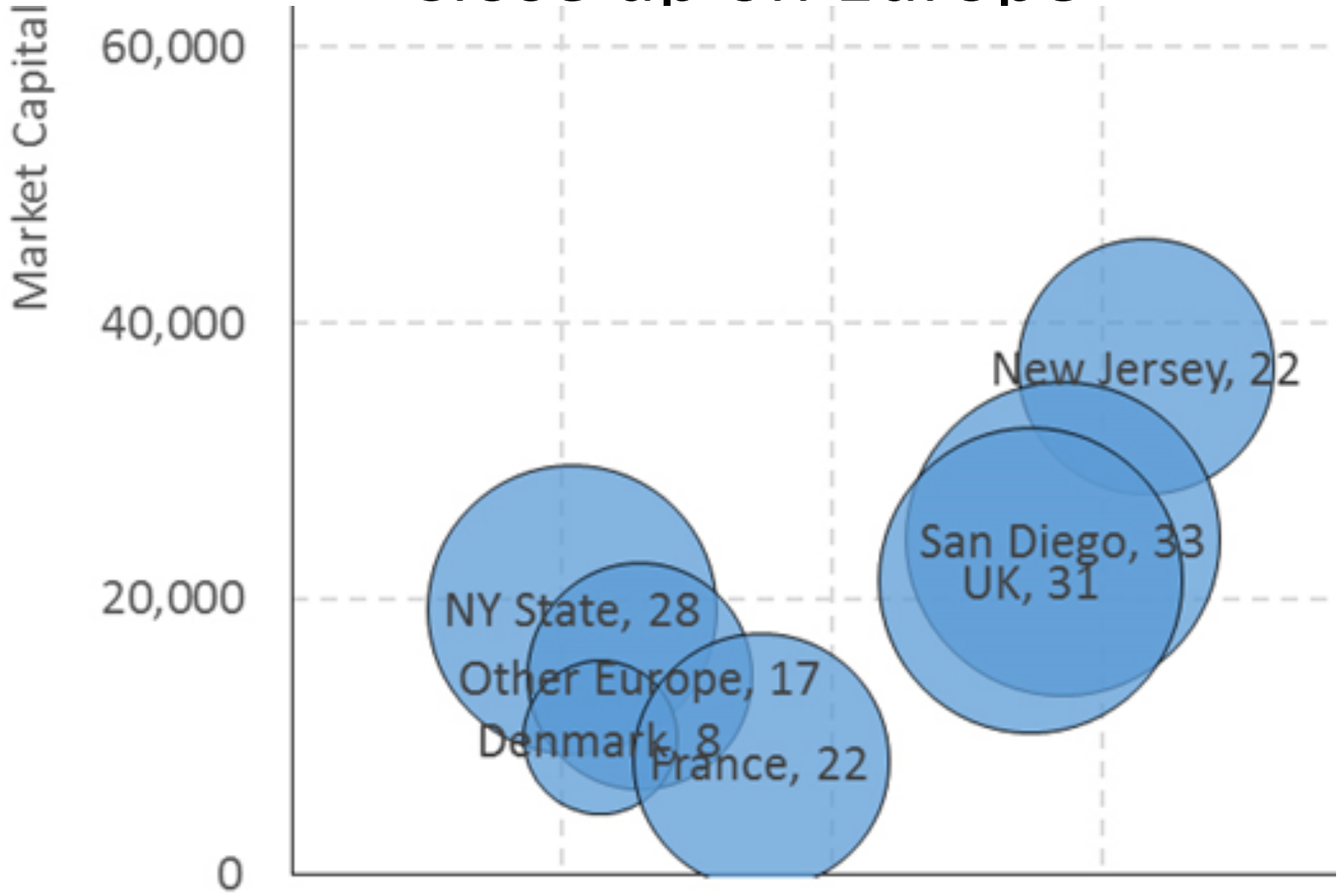
Close up on Europe



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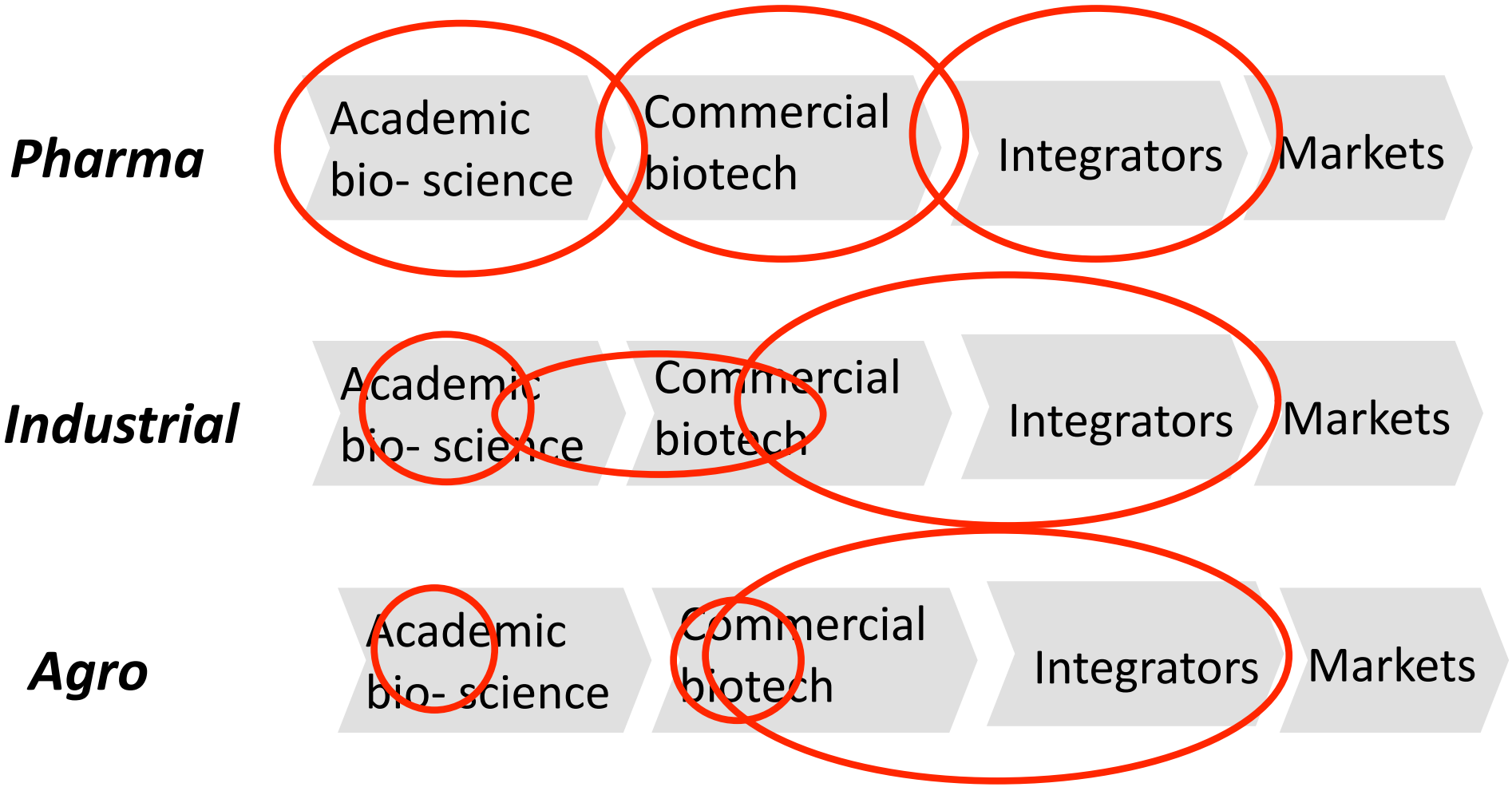
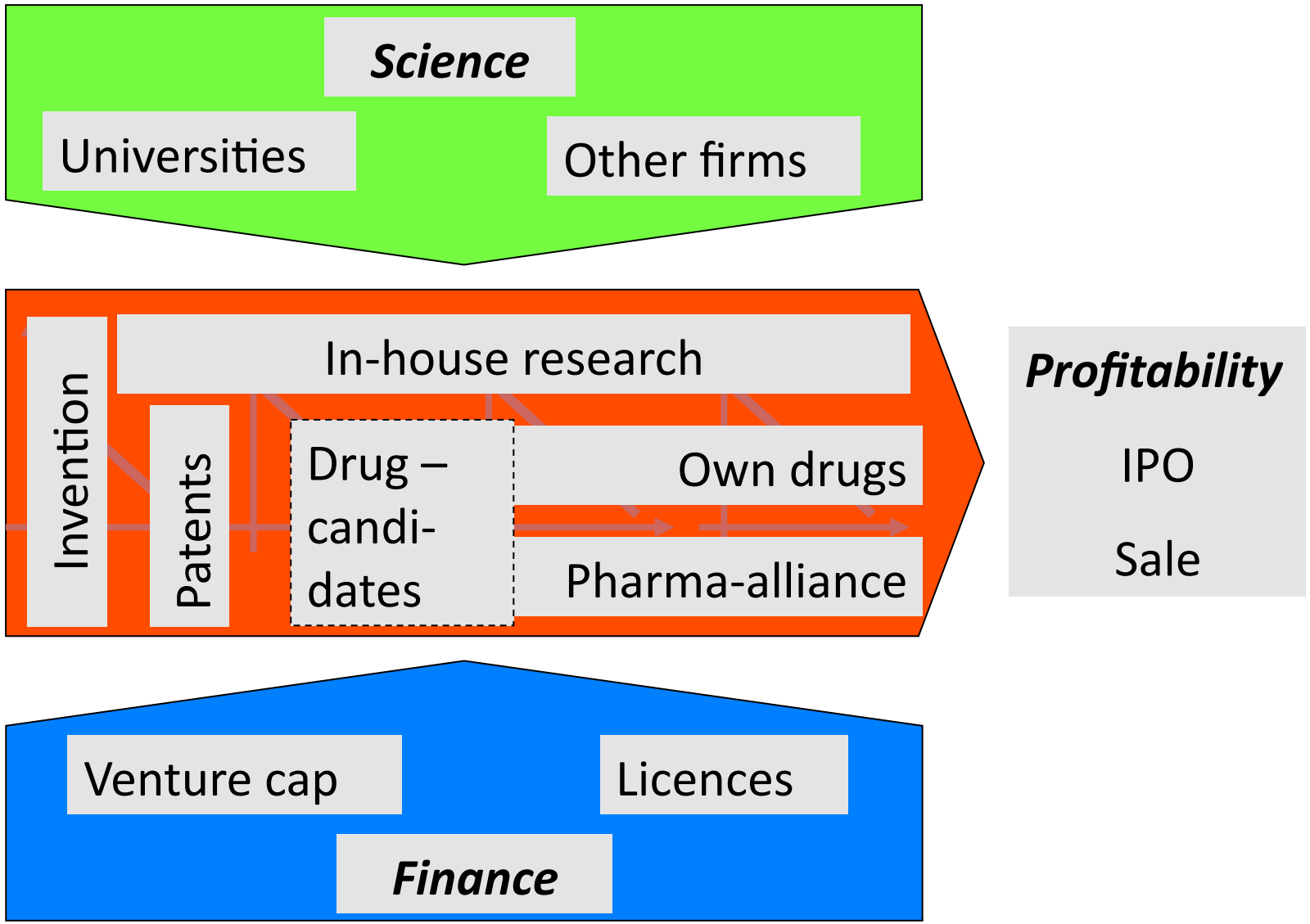
The value chains of bio business



The drug discovery biotech firm: The basics



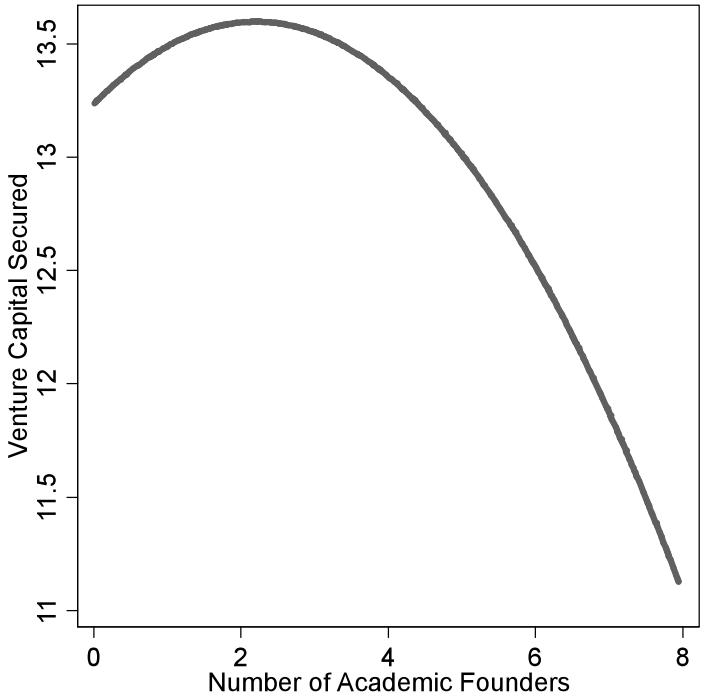
The role of founder's prior affiliation

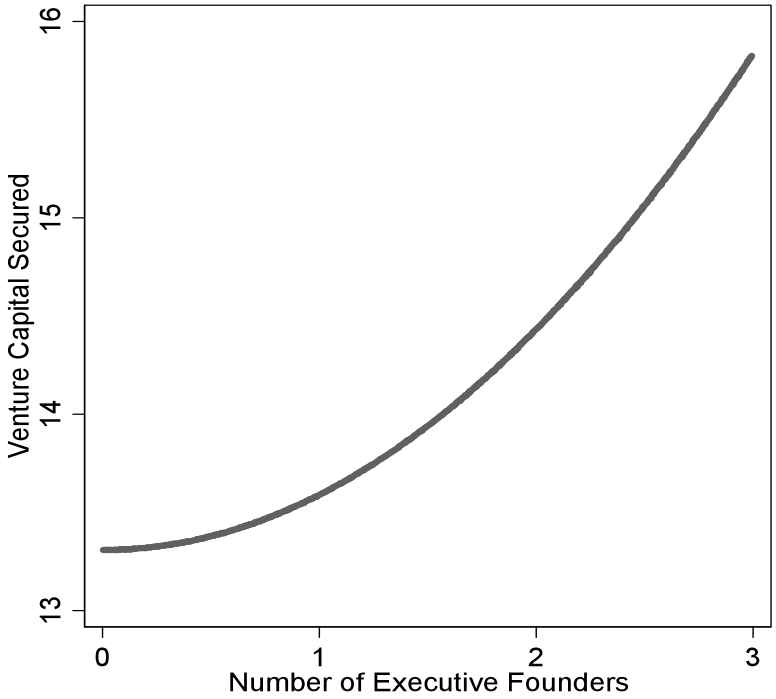
volume of VC financing achieved in first round VC-financing = f

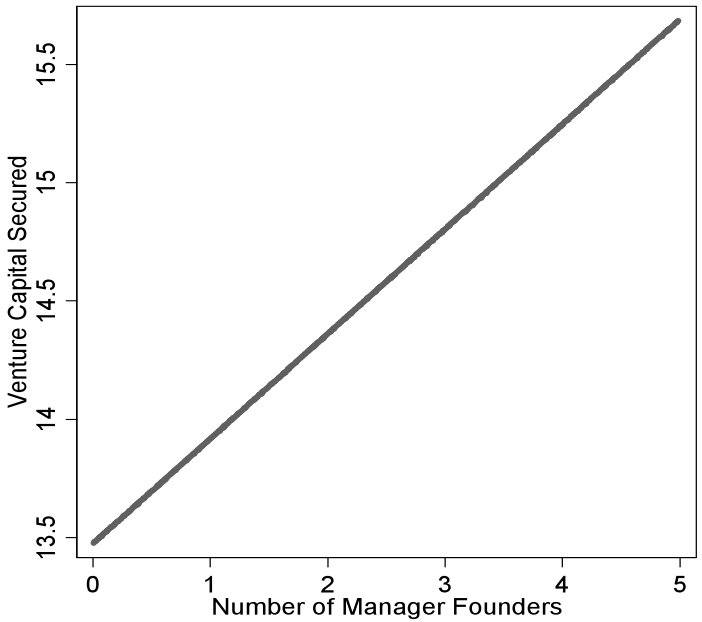
Number of founders by types of prior affiliation:

- Academics
- Managers
- Executives

Source: Reichstein & Valentin:







Same breakdown of founders differentially affect also ***long-term performance*** of biotech firms

(Feldman, Reichstein, Valentin, forthc.)

Danish biotech – some historical highlights

- Breweries, Carlsberg (fermentation, since 1870s)
- Dairy, meat and food processing (microbiology, process technology, since 1870s)
- Food ingredients, Chr. Hansen (since 1870s)
- Insulin: Novo and Nordisk Gentofte (1920s)
- Merged 1990: Novo Nordisk

Recent history

Novo and Nordisk Gentofte merged early 1990s

- Spin-out: Novozymes 2001
- Managerial talent migrated into first wave of bio start-ups around 1990

Talent transfer into the bio boom of 1998-2001

Current wave of bio-start ups to a larger extent builds on university spin-outs draw. Combined with financial/managerial expertise through board representation

Institutional factors: Foundations

- Denmark's major pharmaceutical firms are owned by foundations (Novo, Lundbeck, LEO Pharma)
- Control is made effective by differentiated shares, preventing takeovers
- Differentiated shares are legal in only a few countries. E.g. not Sweden which up to 1995 had a strong domestic phar'al industry, fully matching that of Denmark. Disappeared over a decade.
- Foundations, in addition to preventing takeovers/dismantling of Danish pharma:
    - Give major donations to Danish basic and strategic academic life science
    - Through their venture branches the foundations provide equity to Danish (and internat'al) biotech start-ups

Additional institutional factors, productive

- Strong academic life science. By publications productivity and citation among the top five nations in the world
- The role of the government sponsored “Growth fund” in the 1999-boom

… counterproductive

- High production cost (partly a tax push effect) ➔ inadequate attraction of foreign investment/establishments
- Taxation on the whole unfavourable for entrepreneurship

Synthesis: main drivers behind the success of Danish bio-entrepreneurship

- First early wave (1990) : Availability of managerial talent from pharma
- Second wave (2000): same + venture capital. These two form a powerful interaction
- Third wave 2008 onwards. Experienced venture cap. facilitates a strategic shift towards lean start-ups.

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Department of Systems Biology

MSc in Bioentrepreneurship

A two year master's program

Advanced bio-science + **Skills in bio-based business** = **MSc in Bioentrepre-neurship /CM(bio)**

The BBIP master program in Brief

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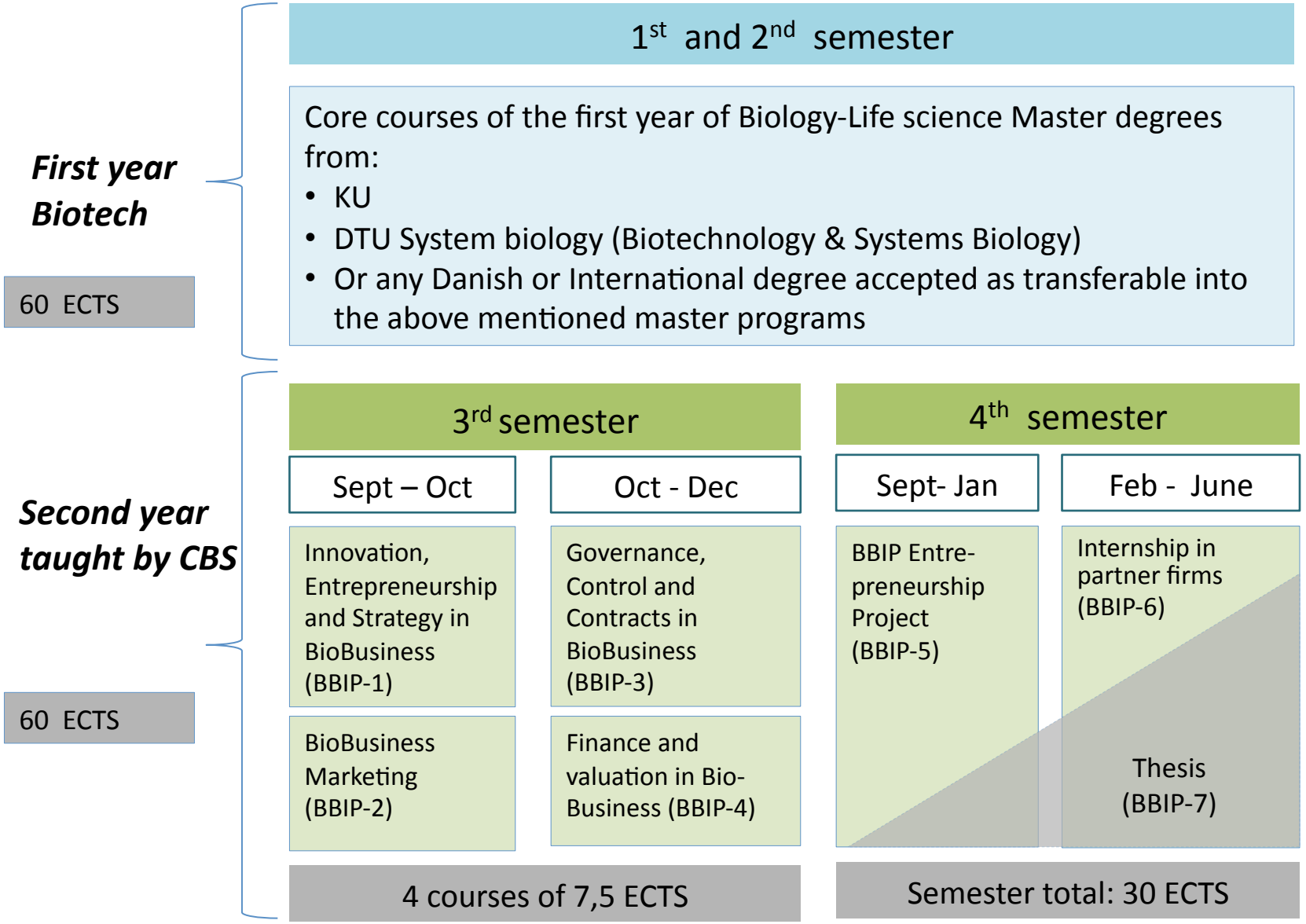
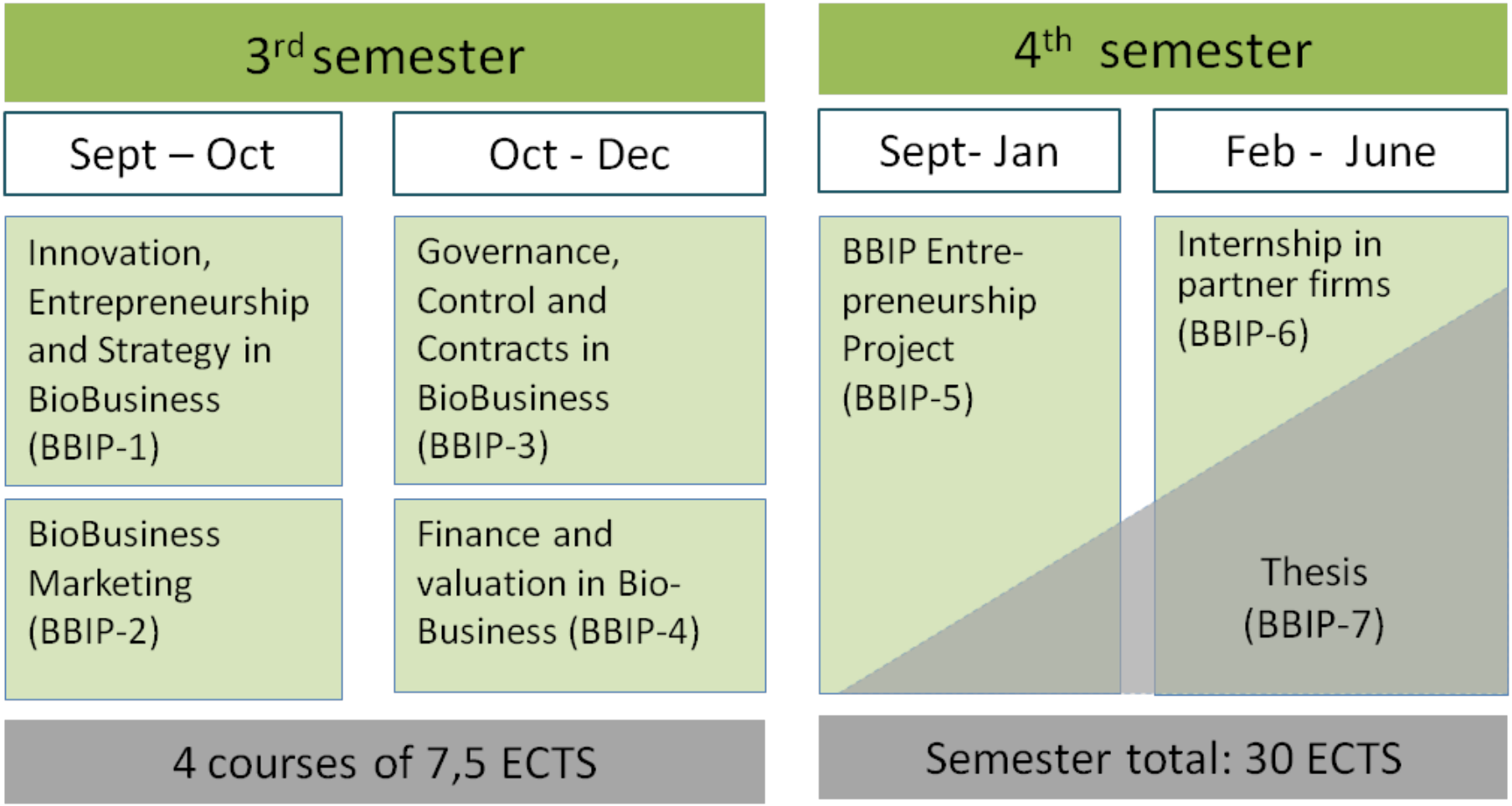
- A two year, full time MSc Programme in bio-entrepreneurship.
- Offered by CBS, jointly with University of Copenhagen and DTU
- Strong collaboration with leading life science firms in the region.
- Industry is looking for new hybrid of science-business managers
- Entry requires a bachelor in bio-science.
- If you have a MSc or PhD in bioscience you can do BBIP in one year

A new two-year master program in Bioentrepreneurship

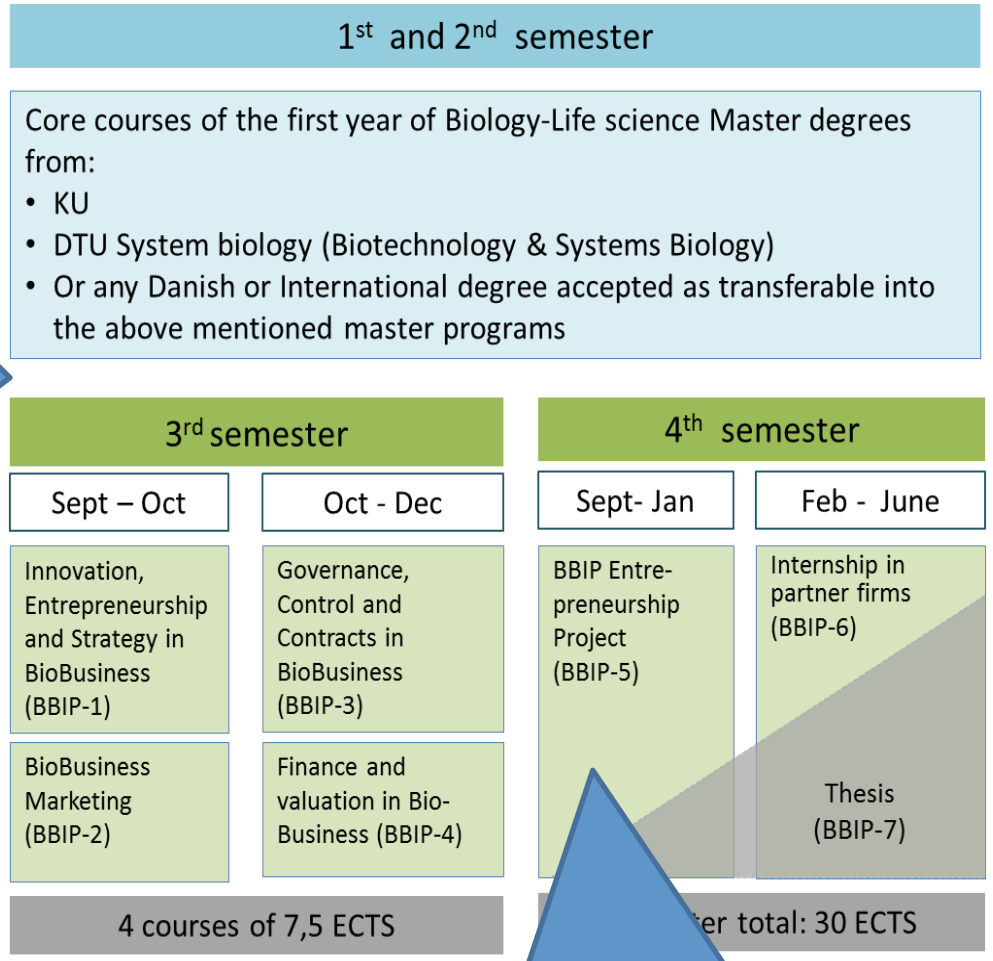


BBIP Second Year



Different entries into BBIP

3. Finalize your MSc or PhD in life science. Enter directly into BBIP's second year. First year's credits transferred.



4. The entrepreneurship course as a single elective

BBIP Entrepreneurship Project elective course, (7,5 ECTS)

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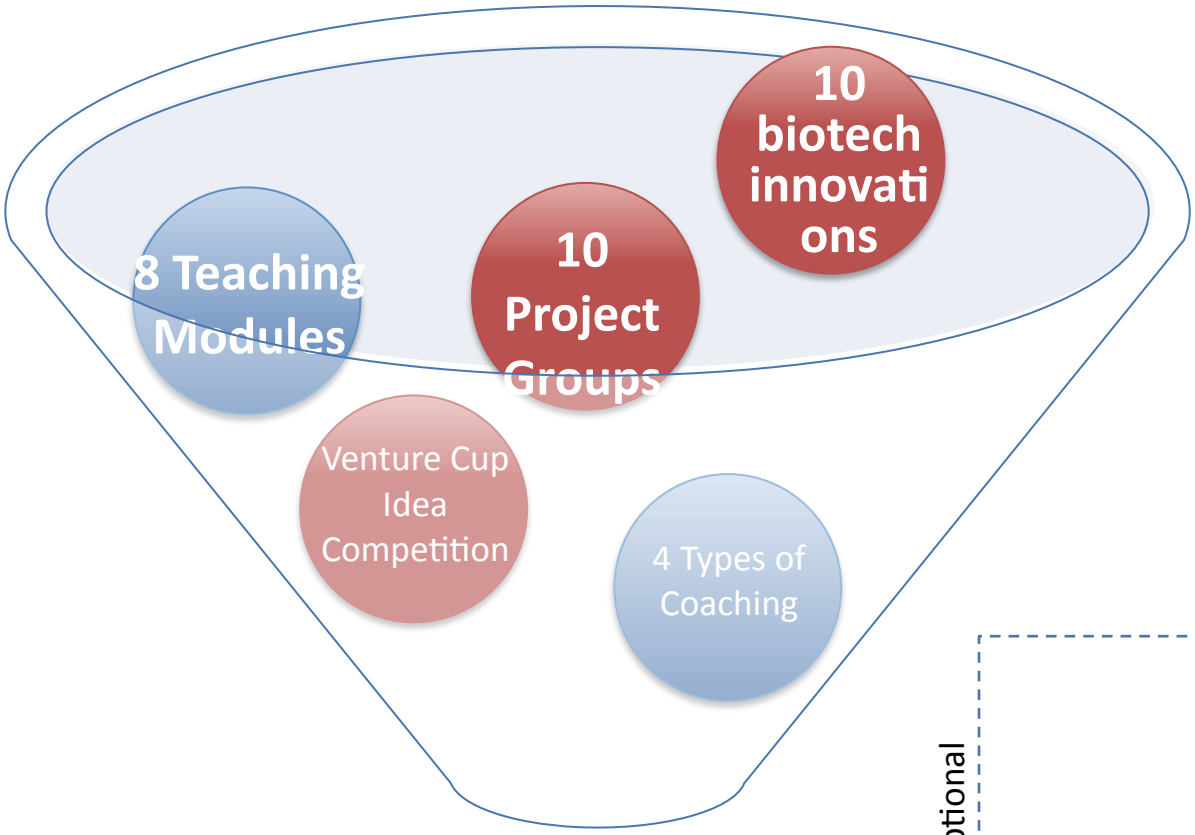

Enrollment into this course also as a elective by students doing their master in bio-lifescience programs or at CBS.

optional

Venture-Cup Business Plan Competition

Oral exams

BBIP-internal Business Plan Competition

Business Plan

Internships

- Students will have an **internship for three months** (from Feb-May) in one of the leading life science firms of the region.
- During the internship students are **mentored** both by the host company and by BBIP professors.

Scholarships

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- Students with a finalized master, or a PhD degree, can **apply for scholarships** from BBIP.

- Application process is when you have been **enrolled** in the program.

Career Prospects

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- As a bioentrepreneur you are prepared for:
  - **Starting up your own company** and

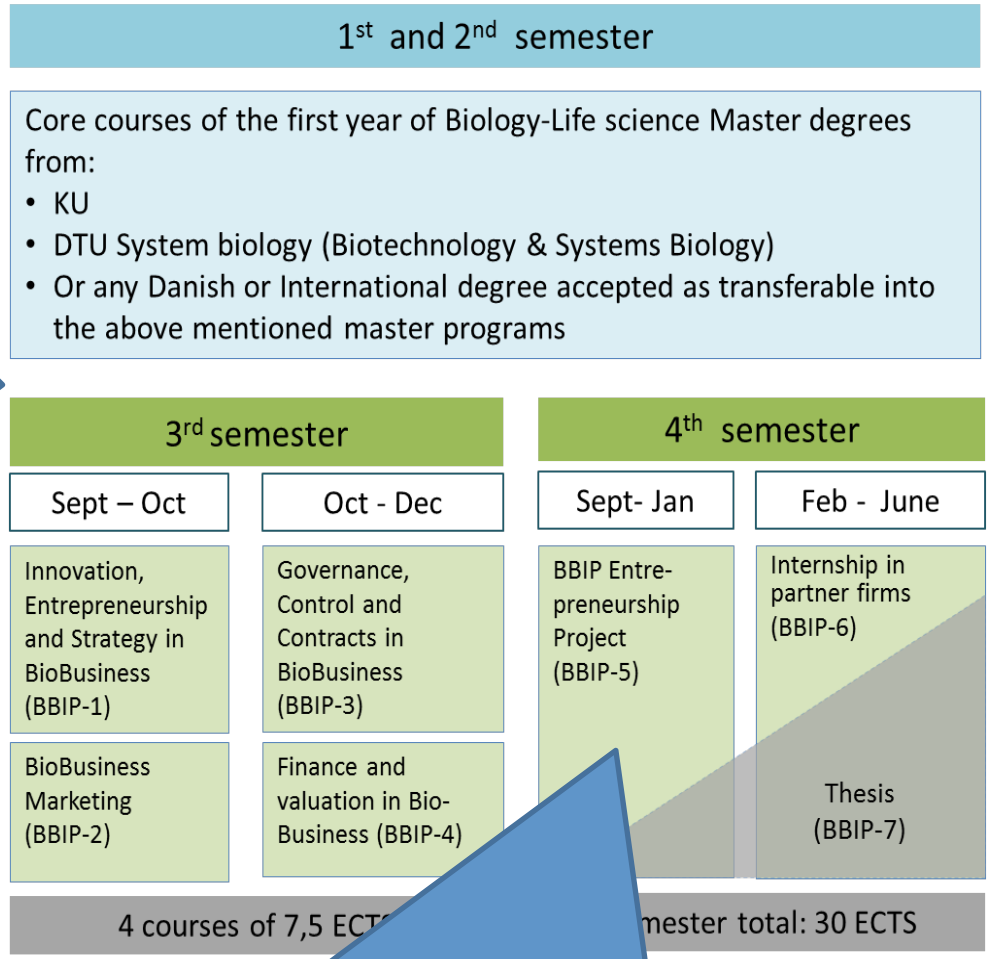
A number of tasks in Danish and international firms including:

- **Market analysis and planning**
- Valuation and finance
- **Management of biotech companies**
- Innovation and IPR
- **Business development**

Application deadlines

For students with Danish bio-bachelor degrees: April 1

For students with non-Danish bio-bachelor degrees: March 1



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4. The entrepreneurship course as a single elective: May , exact date TBA

Entry Requirements

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- The general entry requirements is an **academic bachelor degree** in bio/life science.
- The language requirement is **English at level B**
- Make sure to include the following documentation when applying:
  - Motivational essay
  - CV
  - Bachelor and Master transcripts
  - Relevant recommendations

Admission directly into the second year, (doing the master program in one year at CBS)

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• If you have completed at least one year from a bio /life science master degree you may **transfer your credits to start directly into BBIP 2nd year**.

•Examples of Danish master program where 60 ECTS qualify:

- biology
- biotechnology
- systems biology
- sustainable biotechnology
- molecular biology
- molecular medicine
- biochemistry

- biomedicine
- technical biomedicine
- chemistry and technology
- human biology
- medicine and technology
- nanotechnology
- pharmacy

5 ECT out of you 60 ECT must be in introductory IPR

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IPR courses in the CPH region:

KU:

- Advanced Biotechnology and Intellectual Property Rights
- Intellectual Property Rights and Innovation in Pharmaceutical Sciences
- The present course in IPR

DTU:

- Value creation in pharma- and biotechnology

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Further information

Visit our website: **www.cbs.dk/bbip**

Contact program coordinator Katla Sturludottir (bbip@cbs.dk)

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