



Molecular Biology & Biotechnology (MB&B)



Kadoorie
Biological
Sciences
Building

School of Biological Sciences
Faculty of Science, The University of Hong Kong

School of Biological Sciences

Faculty of Science, The University of Hong Kong

Molecular Biology & Biotechnology (MB&B)

Missions:

- To expose students to the cutting-edge biotechnologies of the 21st century
- To provide hands-on laboratory trainings and experimental based projects
- To equip students with skills in translation of basic knowledge into modern industrial and medical applications

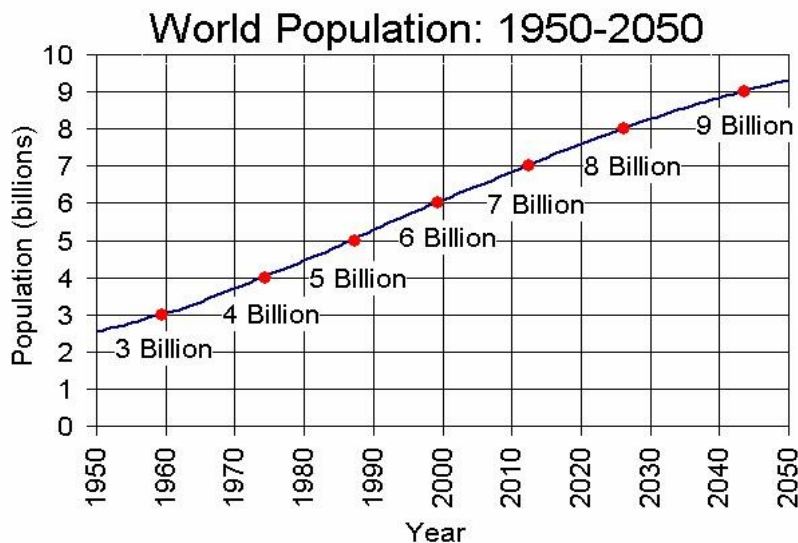
**ASIA'S
GLOBAL
UNIVERSITY**

THE NEXT DECADE
Our vision for 2016-2025

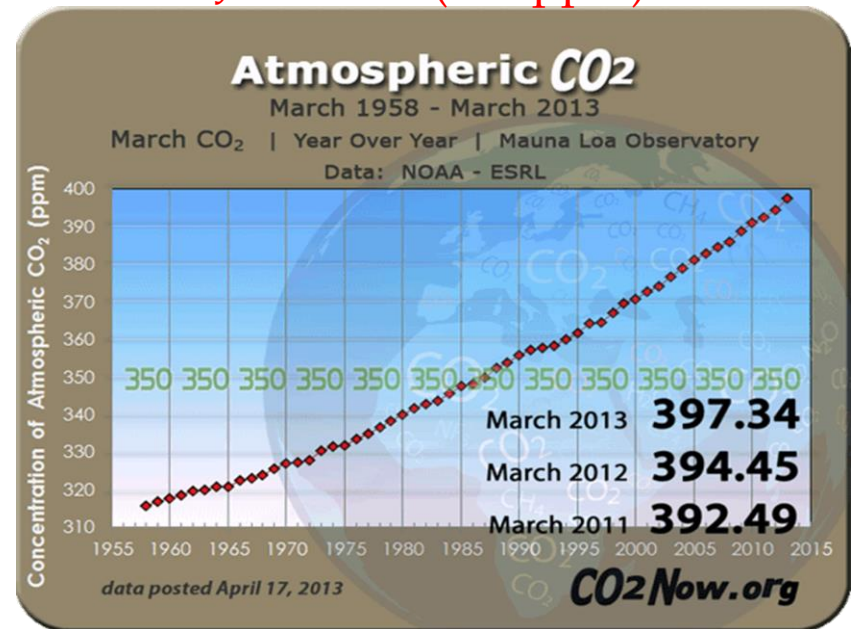
Why Biotechnology is important to human welfare?

- What problems are you facing?

9th June 2020 (417 ppm)



Source: U.S. Census Bureau, International Data Base, June 2009 Update.

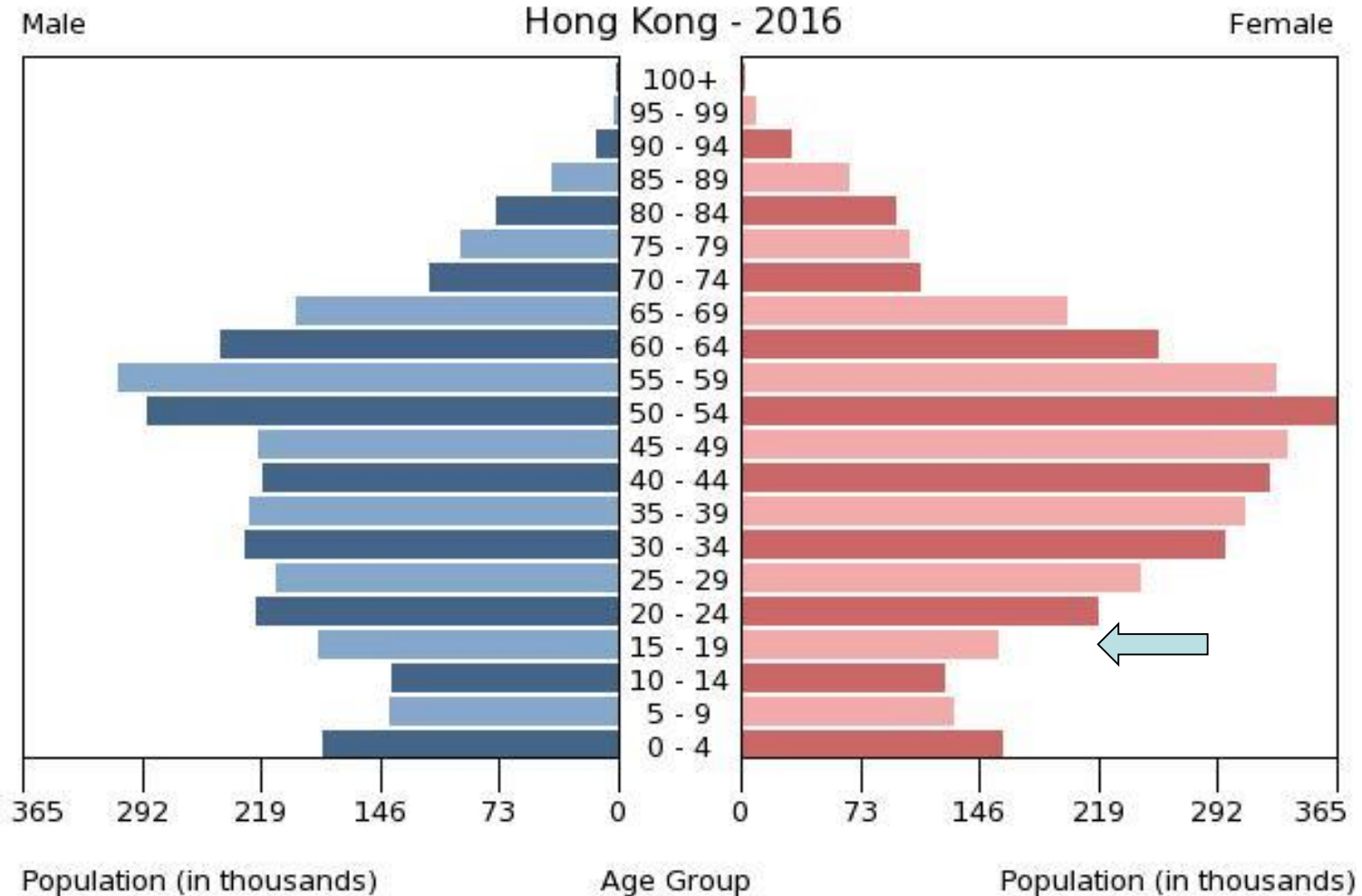


Food supply

Global Warming

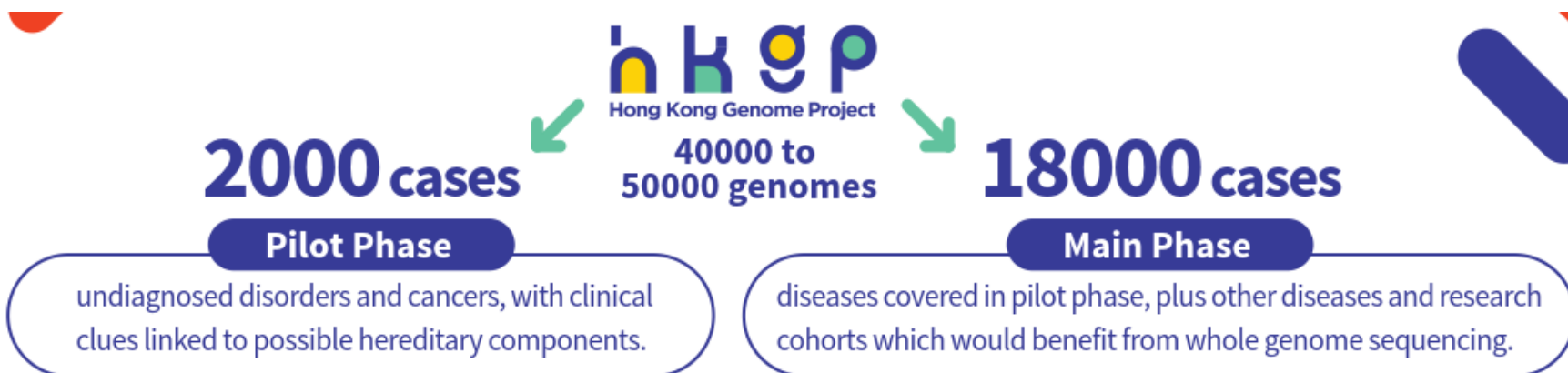
<http://www.co2.earth>

Why Biotechnology is important to human welfare?



Aging: Healthcare Biotechnology

\$1.2 billion-budget Hong Kong Genome Project



HKGP will serve as a catalyst and anchor for showcasing the clinical benefits, piloting related new policy measures, building up talent pool and testing clinical protocols.

2

Enhancing clinical services on genetics and genomics

To provide more standardised clinical services on genetics and genomics in our public healthcare system to benefit more patients.

Scan me for more details

about the Strategic Service Framework for Genetic and Genomic Services of the Hospital Authority

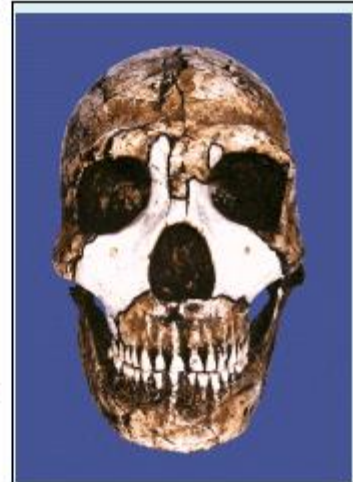


Big Data & Genomic Medicine

How Can We Use This Information?

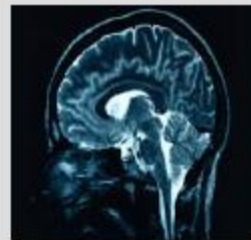


Better understanding of human disease



Insight into human origins

Personalized medicine & Pharmacogenetics



Greater insight into cognitive function



Identifying genetic susceptibility to disease

<http://www.youtube.com/watch?v=22LY9R0SUdk>

MBB Curriculum (Major)

Year 1/2

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

OR

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

OR

BIOL2409 Biotechnology Industry and Entrepreneurship (6)

MBB Curriculum

Year 2/3/4

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

BIOL3401	Molecular biology (6)
BIOL3402	Cell biology and cell technology (6)
BIOL4411	Plant and food biotechnology (6)
BIOL4415	Healthcare biotechnology (6)

Disciplinary Electives (24 credits)

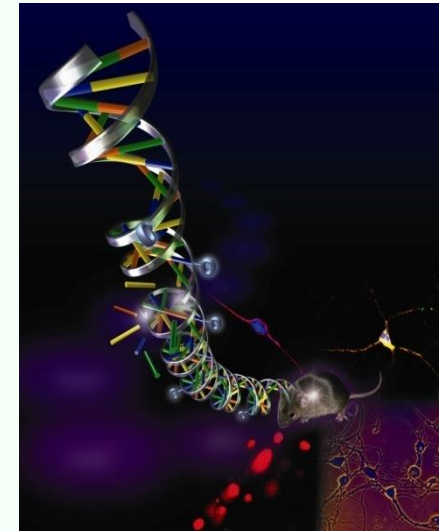
At least 24 credits selected from the following courses:

BIOL3403	Immunology (6)
BIOL3404	Protein structure and function (6)
BIOL3406	Reproduction and reproductive biotechnology (6)
BIOL3408	Genetics (6)
BIOL3508	Microbial physiology and biotechnology (6)
BIOL4409	General virology (6)
BIOL4416	Stem cells and regenerative biology (6)
BIOL4417	'Omics' and systems biology (6)
ENVS4110	Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993	Directed studies in Molecular biology & biotechnology (6)
BIOL4963	Molecular biology & biotechnology internship (6)
BIOL4993	Molecular biology & biotechnology project (12)



MBB Curriculum (Intensive Major)

Year 1/2

(96 → 144 credits)

Introductory level courses (66 credits) (42 for ordinary major)		
Disciplinary Core Courses: Science Foundation Courses (12 credits)		
SCNC1111	Scientific method and reasoning (6)	
SCNC1112	Fundamentals of modern science (6)	
Disciplinary Core Courses (42 credits)		(24 for ordinary major) + 3 courses
BIOL1110	From molecules to cells (6)	
BIOL2102	Biostatistics (6)	
BIOL2103	Biological sciences laboratory course (6)	
BIOL2409	Biotechnology Industry and Entrepreneurship (6)	Quota 40, students major in MBB has priority
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600, but not both.
or	BIOC2600	Basic biochemistry (6) Take either BIOL2220 or BIOC2600, but not both.
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
Disciplinary Electives (12 credits)		(6 for ordinary major) + 1 course
Biol 2408	Green earth-plants and mankind (6)	
BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306, but not both.
BIOL1309	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306, but not both.
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	

MBB Curriculum (Intensive Major)

Year 3/4

2	Advance level courses (66 credits)	(48 for ordinary major)	
	Disciplinary Core Courses (30 credits)	(24 for ordinary major)	+ 1 course
	BIOL3401	Molecular biology (6)	
	BIOL3402	Cell biology and cell technology (6)	
	BIOL4411	Plant and food biotechnology (6)	
	BIOL4415	Healthcare biotechnology (6)	
	BIOL4417	"Omics" and system biology (6)	
	Disciplinary elective (36 credits)	(24 for ordinary major)	+ 2 courses
	BIOL3205	Human physiology (6)	
	BIOL3403	Immunology (6)	
	BIOL3404	Protein structure and function (6)	
	BIOL3406	Reproduction & reproductive biotechnology (6)	
	BIOL3408	Genetics (6)	
	BIOL3508	Microbial physiology and biotechnology (6)	
	BIOL4409	General virology (6)	
	BIOL4416	Stem cells and regenerative biology (6)	
	ENVS3202	Plant physiology and climate change (6)	
	ENVS4110	Environmental remediation (6)	
3	Capstone requirement (12 credits)		
	BIOL4993	Molecular biology & biotechnology project (12)	Need GPA > or = 3.0 FYP

HKU Faculty of Science obtains Royal Society of Biology accreditation for two Majors

28 Jan 2018

The 6901 Bachelor of Science Programme, offered by the Faculty of Science of the University of Hong Kong (HKU), has been conferred accreditation of its Ecology & Biodiversity and Molecular Biology & Biotechnology Majors by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

The Ecology & Biodiversity Major is the first programme of its type accredited by RSB in Asia.

Enhancement of the two Majors will be reflected in the

curriculum starting from September 2018, and the intake of cohort 2018-19 will be able to apply for the accredited options of these two Majors.



The Majors of Ecology & Biodiversity and Molecular Biology & Biotechnology at HKU School of Biological Sciences have obtained accreditation from the Royal Society of Biology (RSB), UK.

Graduates from accredited programmes will receive one year of guest membership of the Royal Society of Biology at Associate level.

May progress to Chartered Biologist (CBiol) in UK

Experiential Learning

- Exchange study programmes in overseas universities in the UK, USA, Canada, Australia and Europe



- Internship (Biological Sciences Internship)
 1. Local and foreign universities
 2. Departments and statutory bodies of the HKSAR
 3. Local biotechnology companies



- Research projects
 1. Final Year Project (FYP) : Publications
 2. Directed Studies in Biological Sciences
 3. Summer Research Fellowship (SRF)
 4. Overseas Research Fellowship (ORF)



Final Year Project

(12 credits) (cGPA 3.0 or above)

Intensive write-up of a topic based on laboratory research

Need a supervisor and required to work in his/her lab

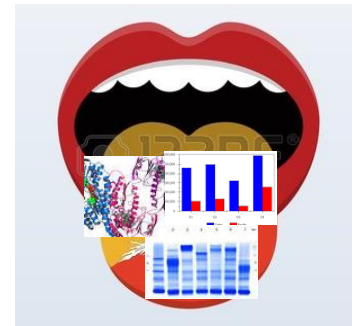
Come up with conclusions based on lab work and other published results

News about SBS seminars:
SBS web → News & Events

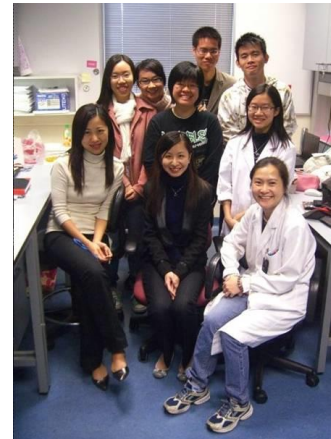
Assessments

FYP:

1. Written report 9000-12000 words (by April)
2. Oral presentation 15- 20 min (in early May)
3. Attending 2 postgrad or guest seminars at SBS (during the semesters)

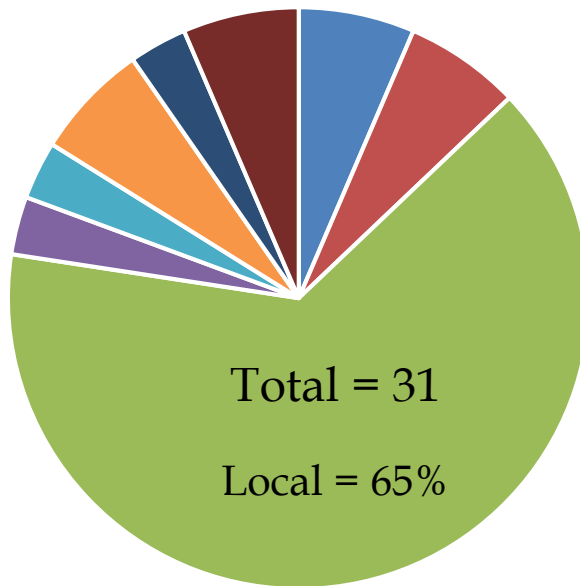


Laboratories



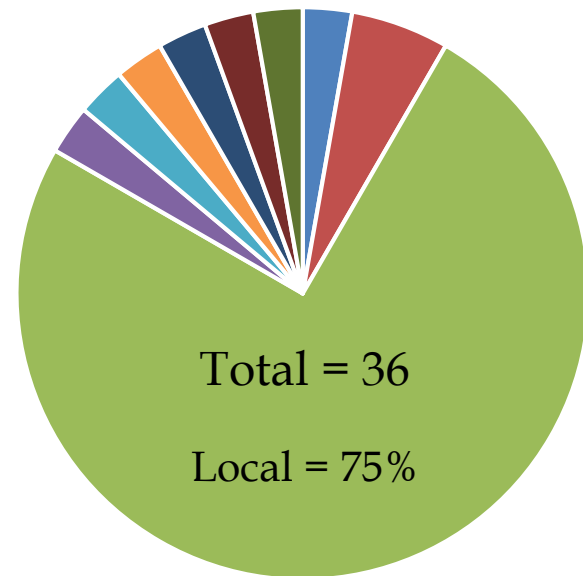
Nationality of MBB graduates

2016



■ Bangladesh ■ China ■ HK ■ India
■ Korea ■ Macau ■ Malaysia ■ USA

2017



■ Bangladesh ■ China ■ HK
■ India ■ Indonesia ■ Japan
■ Kazakhstan ■ Philippines ■ U.K.

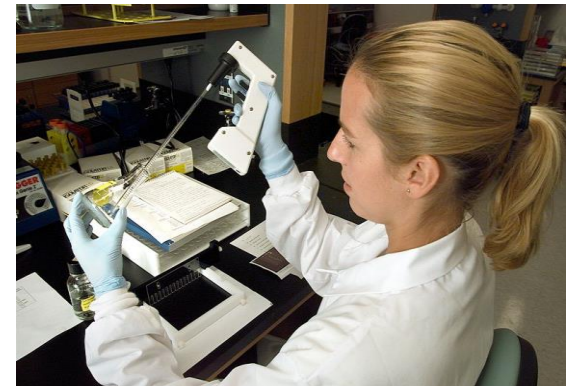
The Job Market

There are plenty of positions available in the job market, and they are not restricted to biotechnology companies, but also many other types of organizations, both in the public and private sector.

HKSAR Government

1. Department of Health
2. The Agriculture, Fisheries and Conservation Department
3. Environmental Protection Department
4. Food and Environmental Hygiene Department
5. Hospital Authority
6. Secondary and tertiary educational institutions

32 graduates in 2019



- **Commerce, industry and community/personal/social services**
 1. Biotechnology companies (e.g. CK Life Science International Inc.)
 2. Health products companies (e.g. Vita Green Health Products Company Ltd.)
 3. Pharmaceutical industries (e.g. Novartis Pharmaceuticals Ltd.)
 4. Private medical laboratories (e.g. PathLab Medical Laboratories Ltd.)
 5. Research institutes (e.g. Genome Centre, HKU)

Educational Institutions -

- * - The Chinese University of Hong Kong

Community, Social and Personal Services -

- * - BGI Hong Kong
- * - Tech Dragon Limited
- Organization's name not reported

Commerce and Industry -

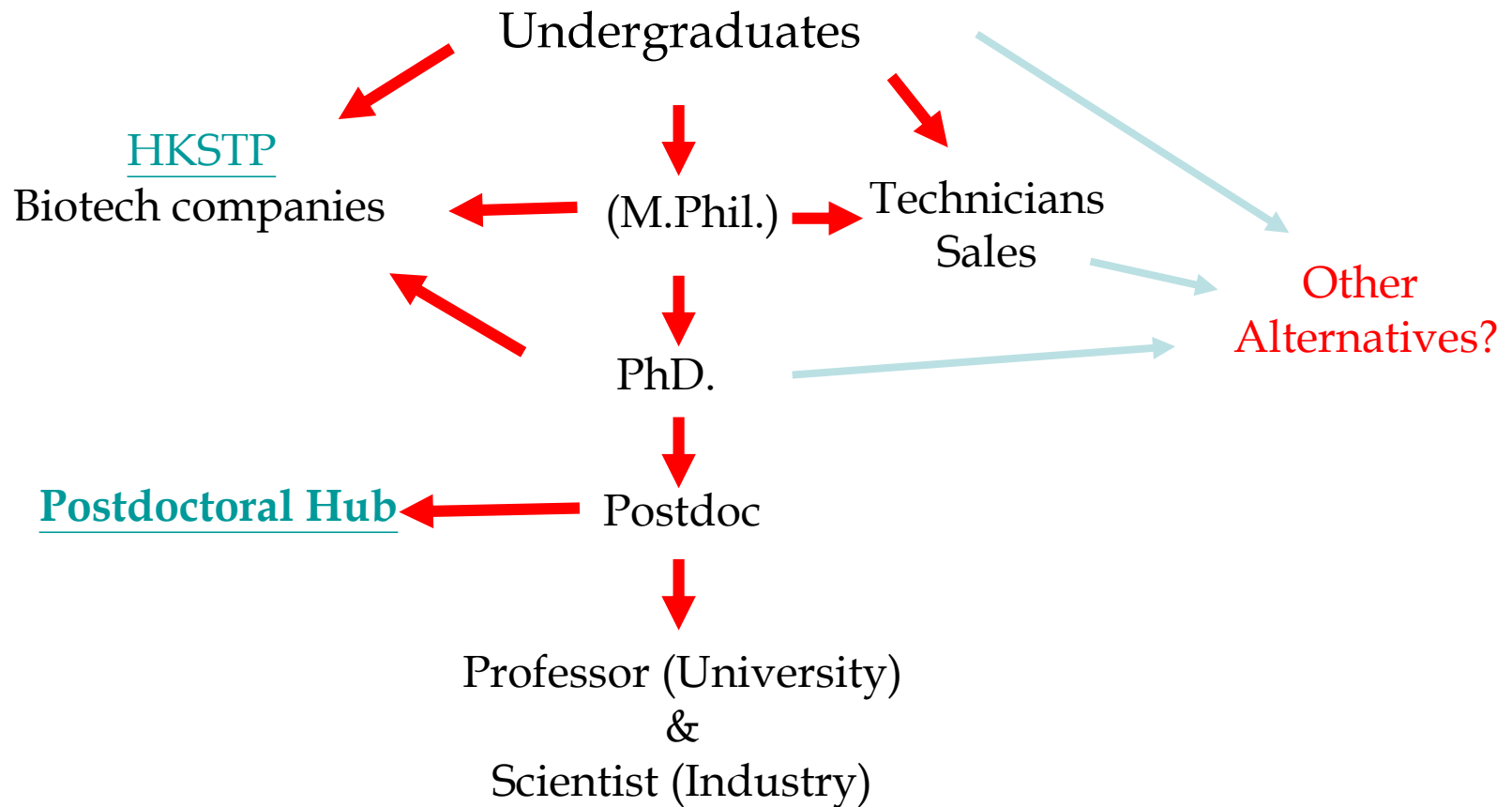
- * - Action X-Ray & Medical Diagnostic Centre
- * - GlaxoSmithKline Limited
- * - Jean Marie Pharmacal Company Limited
- John Swire & Sons (H.K.) Ltd
- * - Johnson & Johnson (Hong Kong) Ltd
- * - St Jude Medical (HK) Ltd
- Tricor Services Limited

*** Related to Biotechnology/Biosciences**

Commerce and Industry -

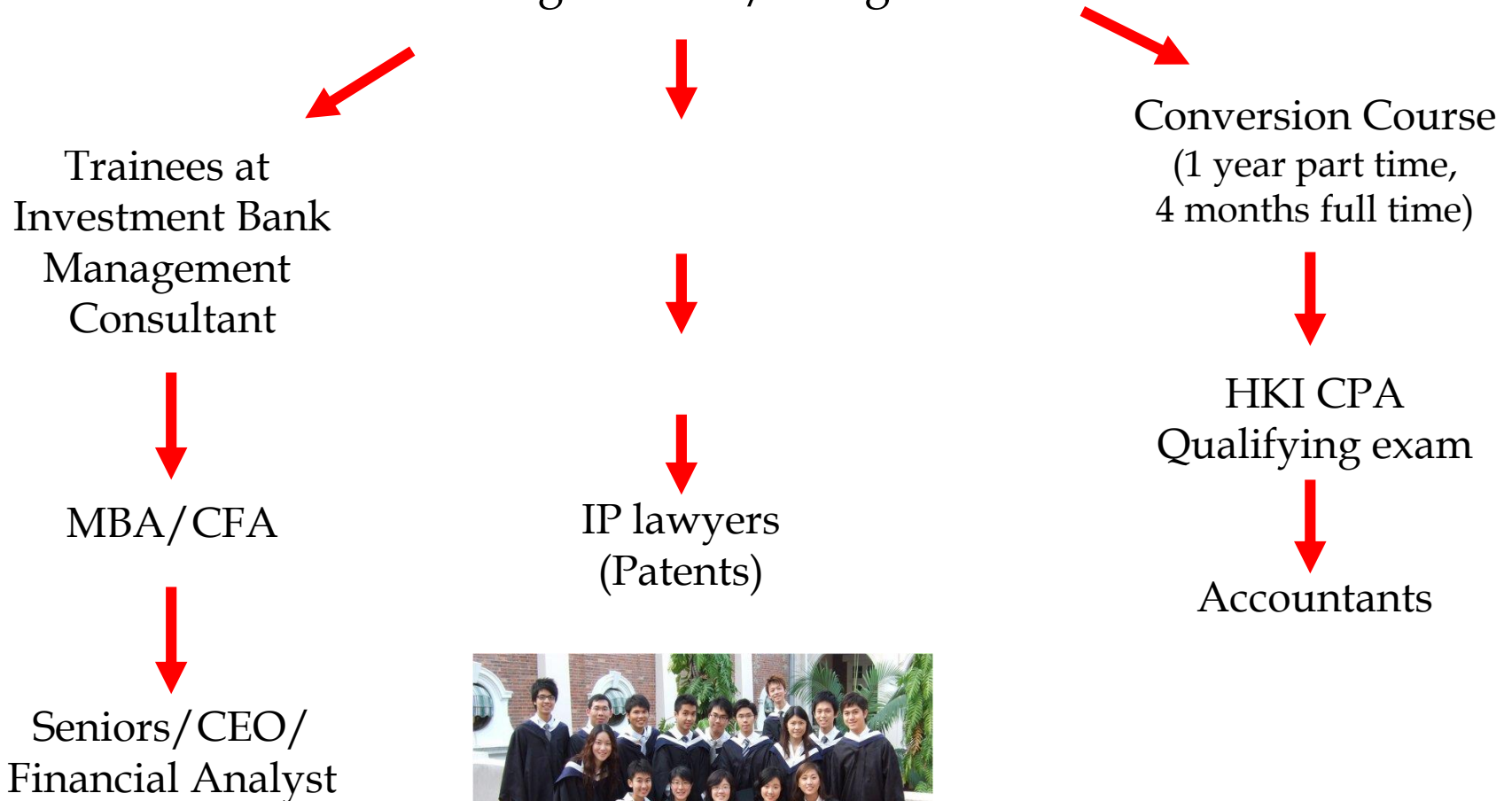
- * - ACGP
- AIA Group Limited
- Buying Hong Kong Limited
- * - CJ CheilJedang
- Edelman
- * - HealthCare Diagnostics Limited
- * - LF Asia
- * - Optimal Medical Laboratory Limited
- * - Pfizer Corporation Hong Kong Limited
- * - St. Jude Medical, Inc.
- Organization's name not reported

Career development of science students



Alternatives for MBB Graduates

Undergraduates/Postgraduates



Major & Minor options

- Major/Double Major in MBB
- Intensive major in MBB
- Minor in MBB
- Minor in other science subject
- Minor in other Faculties (Business, Social Sciences, Arts, Engineering, etc).