University of Basel

DEPARTMENT OF PHARMACEUTICAL SCIENCES

MSc Drug Sciences

Next start: Autumn semester 2018
(Applications from February – April 2018 for autumn semester 2018)

MSc Drug Sciences

Why study?

- ✓ **For you:** Introduction to a scientific/research-oriented career field (experience shows approx. 20 % of students with BSc Pharmaceutical Sciences)
- ✓ **High demand:** Basel is leading in the pharmaceutical sector and number 1 in pharmaceutical patent applications;
  jobs for well qualified personnel in the pharmaceutical industry, government agencies, in academic research, in adjacent areas such as the food sector

MSc Drug Sciences

- ✓ Combination of previous MSc Pharmaceutical Sciences and MSc Toxicology
- ✓ Basic education in the discovery, development, efficacy and safety of substances (main focus medicines)
- ✓ Training for a later career in industry, in the federal institutions or in academic research
- ✓ Mediation of high competency for the drug discovery/drug development process as well as for safety aspects related to substances/agents
- ✓ Theoretical basis for the requirements for subsequent registration as toxicologist
- ✓ Mentoring for students, mentor from industry or from authorities
- ✓ Support from industry for implementation of Master‘s Theses

General structure modules: totally 120 ECTS

Module	ECTS
Introduction and basis of human diseases	9
General skills and experimental tools	6
Target identification/validation and discovery of modulators	8
Translating pharmacology and drug safety to humans	12
Clinical drug development: the basis for market approval	9
Practical Training	8
Elective Courses Elective Module for Specialization in Toxicology, comprising 5 ECTS*	14
Master Thesis Project	50
Exam	4

* Required to fulfil the theoretic background for the later registration as toxicologist

Module details – Courses in the first study year (1)

Module / Lectures	CP
1. Introduction and Basis of Human Diseases (8 CP)	
a. Molecular and Pathologic Basis of Disease (V)	3
b. Cancer: Basics, Cause and Therapy (V)	2
c. Genetic Approaches in Biomedical Research (V)	1
d. Case Studies in Drug Sciences (S)	1
e. Drug Sciences (S - former Seminars on Drug Discovery and Development)	1
2. General Skills and Experimental Tools (5 CP)	
a. Molecular Modeling in Drug Design (V)	1
b. Computer Modeling of Adverse Effects (V)	1
c. Biostatistics and Experimental Planning (V)	2
d. Regulatory Aspects for Approval of Therapeutics (V)	1
3. Target Identification/Validation to Discovery of Modulators (8 CP)	
a. Mechanisms of Drug Action (V)	2
b. Target Validation, and Identification of Target Modulators as Exemplified by Novel Immunotherapeutics (V)	1
c. Concepts of Medicinal Chemistry (V)	2
d. Development of Therapeutic Antibodies (V)	1
e. From Novel Targets to Novel Therapeutic Modalities (V)	2
4. Translating Pharmacology and Drug Safety to Humans (12 CP)	
a. Mechanisms of Toxicity (V)	1
b. Early Safety Assessment and Alternatives to Animal Testing, 3Rs (V)	1
c. Pharmacogenomics (V)	1
d. Organ directed Toxicity (V)	1
e. Reproductive Toxicology (V)	1
f. Psychopharmacology and Neurotoxicology (V)	1
g. Immunosafety (V)	1
h. Drug Metabolism and Pharmacokinetics (V)	1
i. Animal Experimentation for Regulatory Purposes (V)	2
j. Safety Assessment for “First-in-Human Clinical Trials” (V)	2

Module details – Courses in the first study year (2)

5. Clinical Drug Development: the Basis for Market Approval (8 CP)		
a. Clinical Toxicology (V)	1	HS
b. Good Clinical Practice (V)	1	HS
c. Special Topics of Clinical Pharmacology (V)	2	HS
d. Industrial Pharmacy (V)	2	HS
e. Drug Delivery and Targeting (V)	2	HS
6. Practical Training (8 CP)		FS
Laboratory Methods in Drug Sciences	8	FS

Module details – Courses in the first study year (3)

7. Elective subjects (total 15 CP[1])		HS/FS
The following are for specialist toxicology training (recognized for certification as professional toxicologist in accordance with the Swiss Register of Toxicologists http://www.swisstox.ch/swisstox-de/register/reglement.php)		
a. Chemical Risk Assessment (V)	1	FS
b. Specific Toxic Agents (V)	1	HS
c. Environmental Toxicology: Compounds, mechanisms, bioaccumulation, effects (V)	1	FS
d. Environmental Toxicology: Effects on organisms and populations (V)	1	FS
e. Food Toxicology and Risk Assessment (V)	1	FS
Further elective subjects (recommended lectures from the Department of Pharmaceutical Sciences):		
f. Bioactive Compounds in Nutritional Plants (V)	1	HS
g. Clinical Chemistry (V)	1	HS
h. Evaluation of Compound Properties (V) - cancelled for spring semester 2018	1	FS19
i. Information Retrieval (P)	1	HS
j. International Workshop or Conference (Learning contract)	1	(HS/FS)
k. Modern Cancer Therapy (V)	1	FS
l. Natural Toxins, and Toxin Producing Organisms (V)	1	HS
m. NMR in Drug Discovery (V)	1	HS
n. Scientific Writing (S)	3	FS
o. Analytics in the Pharmaceutical Industry - offered first-time spring semester 2018	1	FS

Legend:

CP	ECTS credit points
P	Practical course
S	Seminar
V	Vorlesung (lecture)

[1] Of the 15 CPs in the elective subject, at least 11 must be obtained within the faculty (Pharmacological Sciences lectures). Maximum 4 CPs can be acquired outside the faculty, through self-administration activities towards the University (max. 1 CP) or in tutorial activities (requires a study contract through MOnA).

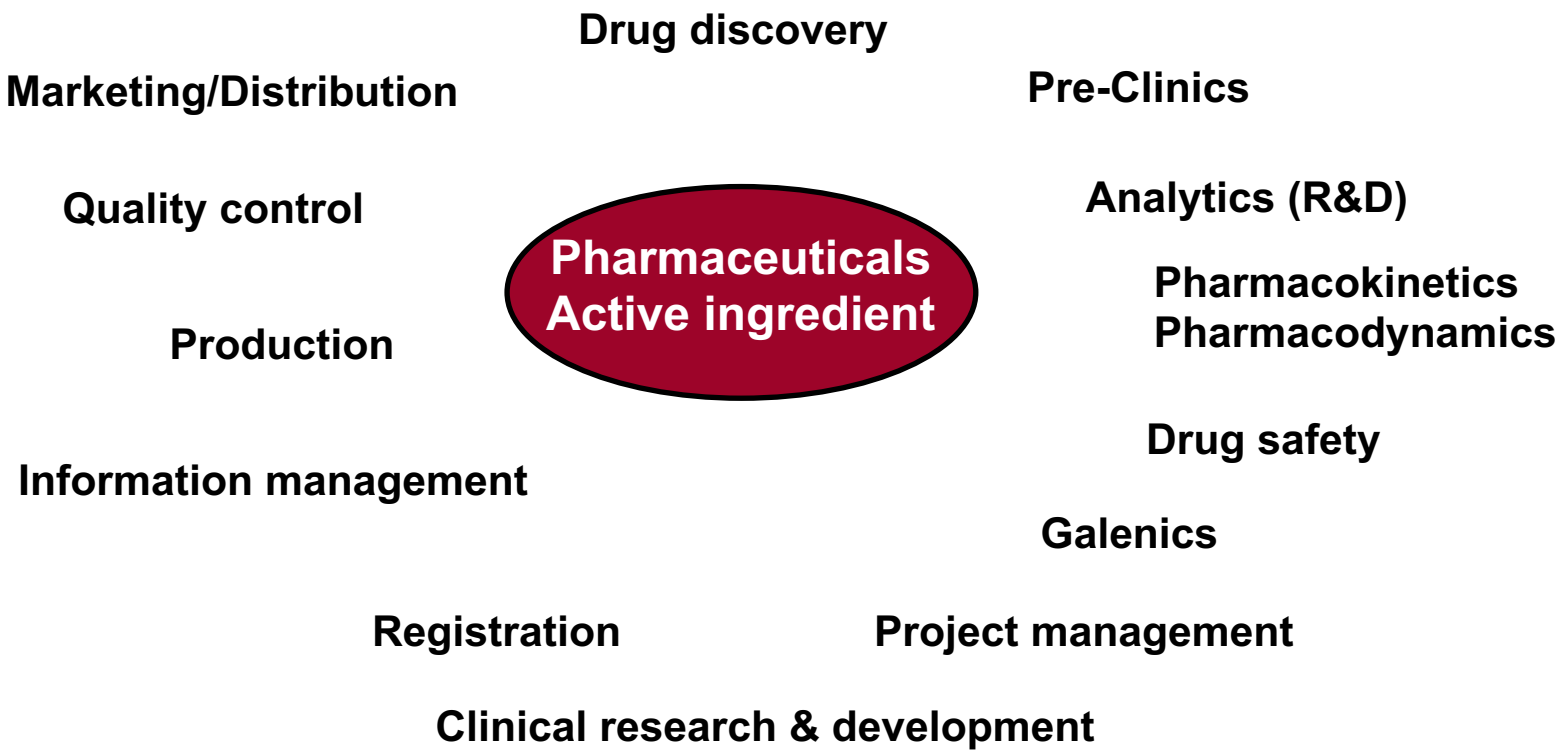
Module details – Courses in the second study year

Module / Lectures	CP
Master thesis (50 CP)	
Master thesis (incl. preparation of written report)*	50
Master examination (4 CP)	
Master examination (incl. preparation)**	4
1. Introduction and Basis of Human Diseases (1 CP)	
e. Drug Sciences (S).....	1
2. General Skills and Experimental Tools (1 CP)	
e. Research Projects in Drug Sciences (S) ..... (to be attended during Master's Thesis in 3rd or 4th semester)	1

* A master work contract must be completed before beginning the master thesis (http://philnat.unibas.ch/dokumente/masterstudium)

** Application for oral thesis examination must be submitted on the completed form (http://philnat.unibas.ch/dokumente/masterstudium) at the latest when the thesis report is submitted.

Fields of activities



Job requirements:

- **Interdisciplinary teams**
  - Solid and broad training (project management, logistics, registration, marketing etc.)
  - Specialization by post-graduate studies or PhD (R&D, Analytics, special galenics, clinical trials etc.)
- **Dynamic environment**
  - Flexibility
  - Training
- **Examples of former/current students**
  Meet current students at the Master‘s info evening of the University of Basel
  (March 2018, cp. http://www.unibas.ch/en/Studies/Dates-Events/Information-Events.html)

Success Story:

- **Polyneuron Pharmaceuticals AG**

Development of glycomimetics in the treatment of autoimmune diseases

Spin-off of the University of Basel wins Venture Kick Finals

The team of Polyneuron Pharmaceuticals: Dr. Pascal Hänggi (Chief Scientific Officer), Dr. Ruben Herrendorff (Mitgründer und CEO) and Dominik Jedlinski (Picture: Venture Kick)

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MSc Drug Sciences: do you have further questions?

- **Director of studies, Prof. A. Odermatt** (alex.odermatt@unibas.ch)

- **Study coordination Department of Pharmaceutical Sciences, Roger Stutz** (studienkoordination-pharma@unibas.ch)

http://pharma.unibas.ch/teaching/msc-drug-sciences/

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Good-bye in autumn 2018…