

## Medicinal Chemistry (J000405)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)  
Credits 7.0 Study time 210 h Contact hrs 45.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	Dutch	Gent	lecture	45.0 h
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Lecturers in academic year 2020-2021

Van Calenbergh, Serge	FW01	lecturer-in-charge
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Offered in the following programmes in 2020-2021

	crdts	offering
<a href="#">Bachelor of Science in Pharmaceutical Sciences</a>	7	A

Teaching languages

Dutch

Keywords

Medicinal chemistry, drugs, molecular mode of action, structure-activity relation.

Position of the course

A number of important diseases (e.g., depression) is characterized by a disrupted communication between certain messengers and specific receptors. Many drugs aim at repairing this disturbed communication. For other diseases, whose cause is not immediately related to such disturbed communication (e.g., asthma), interference with messenger systems may also alleviate the symptoms. This course mainly addresses small molecule drugs that interfere with specific neurotransmitter and hormonal systems or nucleic acids. Although many of these medicines are also addressed in other courses (pharmacology, pharmacotherapy), in this course they are discussed from a chemical point of view and classified according to their molecular mode of action, i.e. based on the macromolecular targets they interact with.

Contents

In this course the pharmacological mode of action of a drug is interpreted in relation to its chemical structure.

In the first part each chapter deals with a specific neurotransmitter system (conformational aspects, biosynthesis and metabolism, different receptor (sub)types) and the drugs that interact with that system (classified by target). Where appropriate, the connection between the structure of the drug and its pharmacological activity is demonstrated.

Chapters:

Acetylcholine and cholinergic receptors

Noradrenaline and adrenergic receptors

Histamine and histaminergic receptors

Dopamine and dopaminergic receptors

Serotonine and serotonergic receptors

Amino acid neurotransmitters

The second part focuses on drugs that interfere with hormones, neurohormones and nucleic acids.

Chapters:

Enkephalins, endorphins and opiate receptors

The arachidonic acid metabolism and inflammation

Intracellular receptors

Nucleic acids and cell division

Peptide hormones and neurohormones

Antiviral agents

Initial competences

You can download the list of prerequisites on <https://oasis.ugent.be/oasis-web/curriculum/voorkennisvancursus?cursuscode=J000405&taal=en>. Having successfully completed courses in Organic chemistry, Physiology and pathophysiology of body systems, and Introduction to pharmaceutical and medicinal chemistry, or having otherwise acquired the corresponding competences.

#### Final competences

- 1 To integrate skills in and knowledge of organic chemistry, biochemistry and physiology.
- 2 To correlate the chemical structure of typical drugs with their pharmacological properties.
- 3 To logically explain the effects and possible side-effects of drugs.
- 4 To critically approach the relationship between a disorder and the most popular drugs.
- 5 To argue the mode of action of non-discussed drugs or future drugs.
- 6 To have a sound grasp of the mode of action of drugs on a molecular level.
- 7 To explain the mode of action of drugs to patients in layman's terms.
- 8 To discuss the content of a scientific medicinal chemistry-related publication in plain language.
- 9 To illustrate the main steps in drug development before it is marketed.

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

Access to this course unit via an exam contract is unrestricted

#### Teaching methods

Lecture

#### Extra information on the teaching methods

Because of COVID19 alternative teaching methods may be rolled out if necessary.

#### Learning materials and price

An elaborate syllabus (two parts, Dutch) (Price: +/- € 40).  
Powerpoint slides projected during lectures are available through Minerva.

#### References

- Recommended book: An Introduction to Medicinal Chemistry (4th Edition) - Graham L. Patrick
- Gecommentarieerd Geneesmiddelenrepertorium, Belgisch Centrum voor Farmacotherapeutische Informatie.

#### Course content-related study coaching

Students have several opportunities to ask the lecturer questions, both individually as in group: after classes or by appointment.

#### Evaluation methods

end-of-term evaluation

#### Examination methods in case of periodic evaluation during the first examination period

Written examination, oral examination

#### Examination methods in case of periodic evaluation during the second examination period

Written examination, oral examination

#### Examination methods in case of permanent evaluation

#### Possibilities of retake in case of permanent evaluation

not applicable

#### Extra information on the examination methods

Theory: oral exam (approx. 15 minutes) with sufficient time for an extensive written preparation.

The evaluation of this course may potentially be switched to an exclusively written exam depending on the public health status related to COVID-19 and the associated measures.

Any changes to the form of evaluation will be published well in advance on UFORA.

#### Calculation of the examination mark

Final evaluation (examination mark): theory 100%