Master's programme in Drug Discovery and Safety

Specialization Drug Discovery and Target Finding

Study programme

General description

In the specialization Drug Discovery and Target Finding (Molecular Pharmacology) you will investigate where and how the biological active molecule of a drug works within the human body. The research focuses on ligand-receptors interactions, signal transduction events, and novel concepts like ligand-independent signaling, biased signaling and receptor dimerization. You will learn concepts of molecular biology and pharmacology and use innovative imaging and biophysical approaches.

Programme components

The Master's programme in Drug Discovery and Safety is a two-year programme starting in September. The specialization Drug Discovery and Target Finding contains the following components (EC):

- Compulsory courses (36)
- Major research project (42)
- Literature thesis and colloquium (12)
- Ethics and academic skills (6)
- Elective: minor research project; traineeship abroad/company; optional courses (24)

Course overview

Period	Month	Course (EC)	Category
1	Sep – Oct	Chemical biology (6)	Compulsory course
		ADME processes and toxic side effects (6)	Compulsory course
		Principles of pharmacochemistry (6)	Introductory course*
2	Nov – Dec	High-throughput screening (6)	Compulsory course
		Signal transduction in health and disease (6)	Compulsory course
		Drug induced stress and cellular response (6)	Optional course
3	Jan	Drug action (6)	Compulsory course
4	Feb – Mar	Computational design and synthesis of drugs (6)	Compulsory course
5	Apr – May		
6	Jun		

More information: www.vu.nl/dds

This overview can be subjected to alterations.
Every part of the programme, including the choice of optional courses, has to be discussed and agreed upon with the Master's coordinator and approved by the examination board.

Master's coordinator: **Dr. Marco Siderius**
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*Compulsory course only for students without prior background in pharmaceutical sciences

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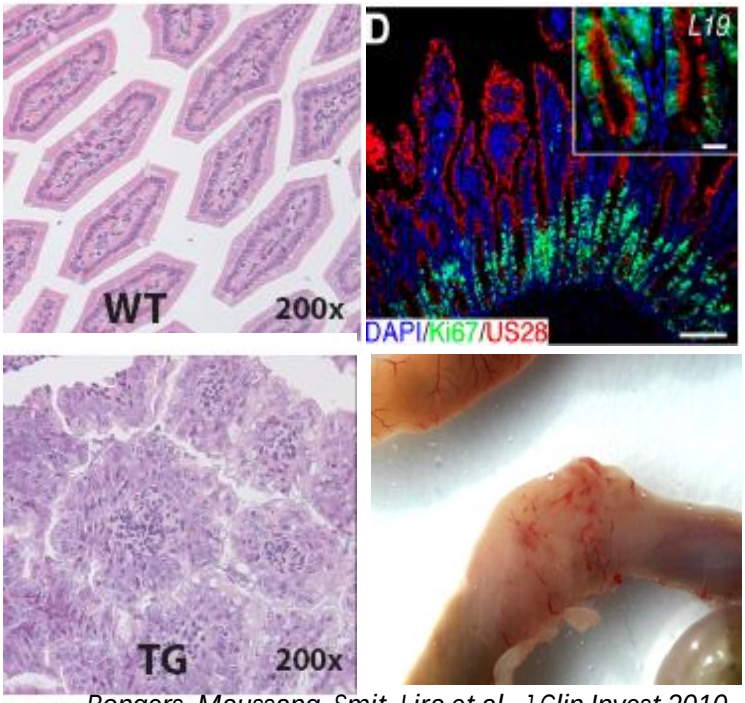
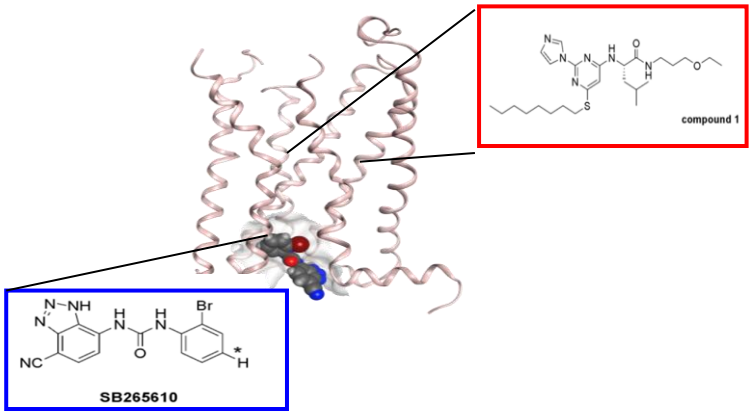
Research topics

Human and viral chemokine receptors as novel targets for therapeutic intervention of cancer

The cloning of the human genome resulted in the identification of many new drug targets, including new G-protein coupled receptors (GCPRs), histamine (H4) and chemokine (CXCR7) receptors. In the 'Receptor Structure Function' research group, we examine the role of these novel receptors in inflammation and cancer using *in vitro* (cell-based signaling assays) and *in vivo* (xenograft mouse) model systems. Moreover, genomes of herpes viruses contain genes encoding GPCRs, which show homology to chemokine receptors. Interestingly, these viral chemokine receptors display oncogenic properties and induce tumor formation *in vivo*. These viral receptors may therefore play a role in cancer after viral infection and can be considered as novel drug targets.



Bongers, Maussang, Smit, Lira et al. J Clin Invest 2010

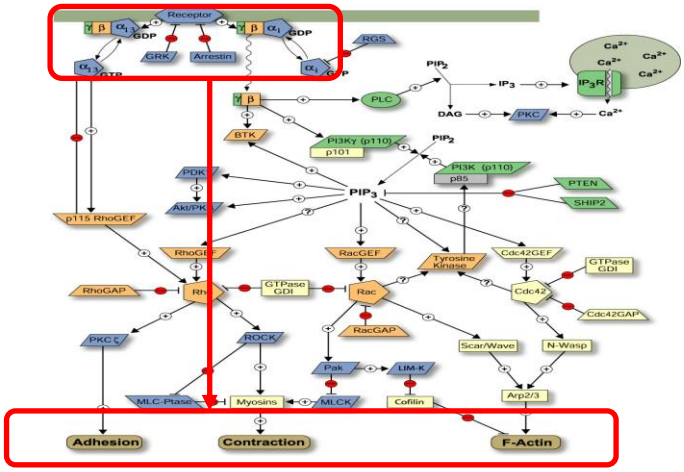


Novel concepts in drug discovery

Our molecular receptor pharmacologists study ligand (drug) interactions with receptors, signal transduction events, and novel concepts like biased signaling, ligand-independent signaling and receptor dimerization. We utilize molecular biology, pharmacology, innovative imaging and biophysical approaches. These studies aim on elucidating the role of receptors in health and disease and ultimately to validate their potential as future targets for pharmaceutical intervention.

Network-based drug discovery to find new targets

In order to completely understand the key role of GPCRs in pathological signaling, we use a systems biology approach to map key signaling events and components. We investigate the role of (viral) GPCRs in pathology (cancer, inflammatory disease) using genome and proteome wide analyses. These studies unveil the intricate organization and interplay of signaling pathways involved. Besides identification of new drug targets, this approach will direct *in vivo* studies to examine and modulate the clinically relevant GPCR-induced signaling pathways.



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