Project CAPSID
of the Slovakia-Austria Cooperation Programme

EUROPEAN UNION

Interreg
Slovakia-Austria
European Regional Development Fund

Seminar Speaker Series

in the framework of Interreg V-A project CAPSID

presents

Dr. Joachim Goedhart

University of Amsterdam, NL

Imaging G-protein signaling with genetically encoded fluorescent probes

15. 04. 2021 at **14:00**

Online virtual talk via Zoom

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BIOMEDICÍNSKE CENTRUM SLOVENSKÁ AKADÉMIA VIED

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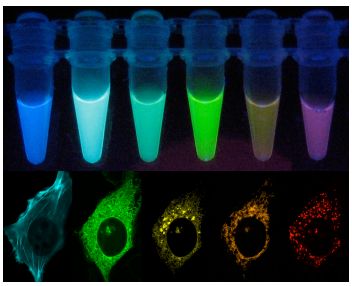
Dr. Ir. Joachim Goedhart

University of Amsterdam, Netherlands

Molecular Cytology



RESEARCH INTEREST

All living creatures are composed of small (< 1 mm) entities, known as cells. During their life, cells undergo changes such as growth, differentiation and movement. These changes are steered by molecules in the extracellular environment. The translation of extracellular, chemical information into a cellular state change is a process known as signal transduction. Signal transduction is mediated by a diverse set of signaling molecules located inside the cell, i.e. enzymes, second messengers, lipids, scaffolds and transcription factors. **It is increasingly recognised that spatial and temporal aspects of molecular interactions and activity are key for correct cellular responses.**

„Our research aims at understanding the spatial and temporal aspects of molecular activities that drive cellular processes.“

ANNOTATION

We focus on signaling events initiated by a **class of seven-transmembrane spanning receptors, the G-protein coupled receptor (GPCR) family.** To examine the molecular events that occur during signal transduction, we engineer and employ genetically encoded fluorescent biosensors. These versatile tools enable quantitative, functional imaging of molecular interactions, protein activities or second messenger concentration in single living cells. The functional imaging studies will improve our understanding of how cells respond to their environment. **Several classes of optical probes are used**, e.g., FRET biosensors, relocation-based probes and intensity-based probes that use circular permuted fluorescent proteins. I will discuss the engineering and application of fluorescent proteins and biosensors in the context of GPCR and G-protein signalling in single cells.

REFERENCES

[1] Goedhart J. **Nature**. (2018) 554(7690):31. Dispense with redundant P values.

[2] Goedhart J, et al. **Nature Commun.** (2012) 3:751. Structure-guided evolution of cyan fluorescent proteins towards a quantum yield of 93%.

[3] Kremers GJ, **Goedhart J**, et al. **Biochemistry**. (2006) 45(21):6570-80. Cyan and yellow super fluorescent proteins with improved brightness, protein folding, and FRET Förster radius.

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