

LERU STudent REseArch Mobility Programme (STREAM) Project proposal

Host University: Leiden University

Main Research Field (drop-down list): 13.3 Chemistry

Chemistry, Biology, Medicine, Life science, Drug delivery, Chemical Biology

Research project title:

In vivo cell fusion using a synthetic model system

Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
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Possible duration in months:

Minimum: 3 months

Maximum 2 semesters

Suitable for students in: Bachelor level Master level

Prerequisites:

- Minimum GPA 3.2 out of 4
- BSc degree in Chemical Biology, Chemistry, Biology or in a closely related field.

Description:

Fusion of lipid bilayers, or membranes, is a ubiquitous process. It occurs in the cells of our body during cargo exchange by membrane vesicles and during viral infection, but also in industrial processes such as yeast production. While many proteins like SNAREs have been identified that play crucial roles in membrane fusion, the molecular mechanism of fusion remains unclear. This fascinating process is unexpectedly complex and we aim at elucidating the details of this process using my biomimetic model system which has all the characteristics of natural membrane fusion; targeted docking, followed by lipid and content mixing in the absence of leakage. Our model system is composed of a complementary pair of lipidated peptides able to form a heterodimeric coiled coil motif at the membrane interface similar to natural SNARE subunits. The different steps of membrane fusion will be studied using biophysical and

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biochemical techniques with a special focus on peptide-peptide and peptide-lipid interactions. Furthermore, in-vitro membrane fusion between liposomes and live cells will be studied using optimized biomimetic model systems.

Faculty: Science

Faculty Department: [Leiden Institute of Chemistry](#)

Deadline for nomination to reach host university:

1 April or else 1 October.

Notification of admission given by the end of:

Approximately 6 weeks after receipt of the application.

Additional information:

Number of placements available: max. 2 per semester, at least 3 months, preferably longer. Start date is negotiable.

Contact person:

Ms. Usha Mohunlol - Student and Educational Affairs - Coordinator LERU STREAM

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