Group	**:**	Laboratory of Organic Chemistry / NanoChemical Biology group
Project	**:**	**Synthetic Peptides that Boost Plant Regeneration**
Supervisors	**:**	Jasper van de Sande and Bauke Albada

<u>Key-words</u>: *Peptide Hormones, Sulfated Peptides, Solid-Phase Library Synthesis, Peptide Purification*

<u>Introduction</u>: Peptides are naturally occurring biomolecules that often display prominent roles in organism. In plants, peptide hormones have been found to regulate gene expression which cause changes in a variety of processes, including cell proliferation and plant regeneration. By boosting regeneration with synthetic peptides, life-cycle of plants can be shortened followed by increase in productivity. However, many plant species are recalcitrant, and require a key technology to reach efficient plant regeneration. Several peptide hormones are found to induce cell proliferation, differentiation and shoot regeneration in several *Arabidopsis* plant species. Therefore, we aim to synthesize peptides that can enhance the regeneration of protoplasts into plantlets for recalcitrant plant species or cultivars.

<u>Goal</u>: find an ultimate regenerator peptide that boost the regeneration for a wide variety of plant species.
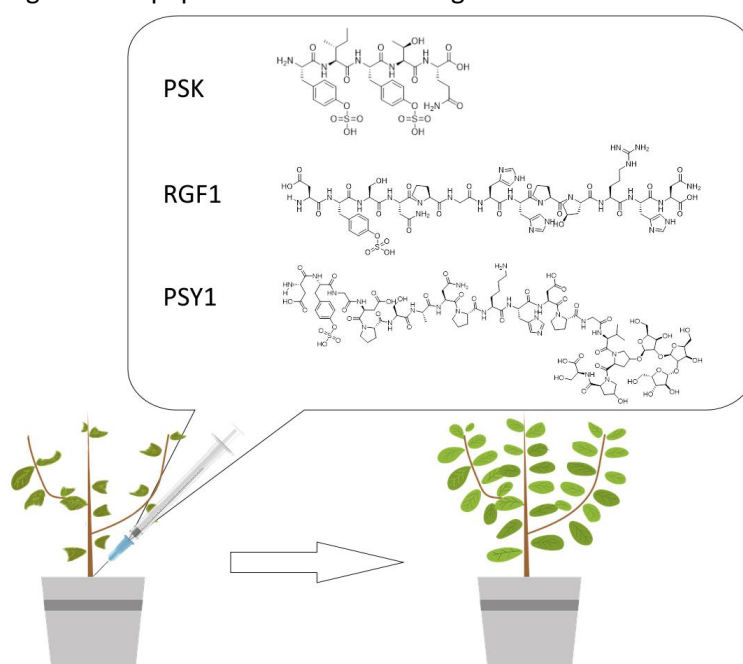

Figure 1. Graphic Illustration of Plant Peptide Hormones used as regenerators for plants, stimulating proliferation, expansion and growth. Peptide libraries are based on scaffolds of Phytosulfokine (PSK), Root meristem Growth Factor (RGF), and Plant peptide containing sulfated tyrosine 1 (PSY1).

<u>Topics to be studied</u>

- Synthesis of peptide libraries based on in silico studies and scaffolds of known peptide hormones
- Glycosylation of amino acids and subsequently peptide coupling
- Peptide synthesis with sulfated tyrosine residues

<u>Techniques to be used</u>
Organic Synthesis (amino acid modification, carbohydrate synthesis, coupling reactions), Solid-Phase Peptide Synthesis, Peptide Synthesizer, Analytical and preparative-HPLC, Mass Spectrometry, (1H, 13C, 2D) NMR.

<u>Information</u>
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