Drug discovery from nature using advanced bioanalytical chemistry

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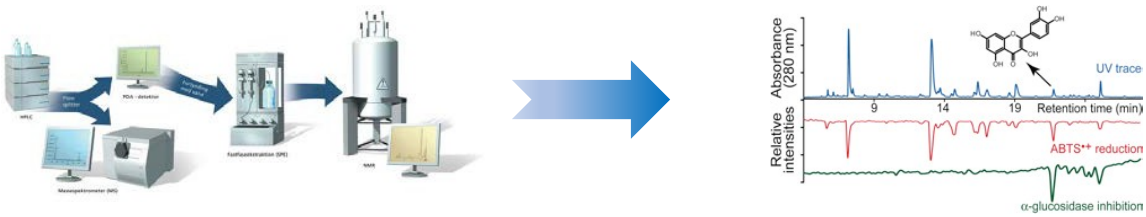
High-resolution biochromatography coupled with HPLC-PDA-HRMS-SPE-NMR for identification of antimicrobials, anticancer and/or T2D drugs from natural sources

Copenhagen Small-Molecule NMR Center houses state-of-the-art NMR equipment for hyphenated HPLC-PDA-HRMS-SPE-NMR experiments (left-hand figure below) – and we are leading experts in high-resolution biochromatography coupled with HPLC-PDA-HRMS-SPE-NMR (left-hand figure below)

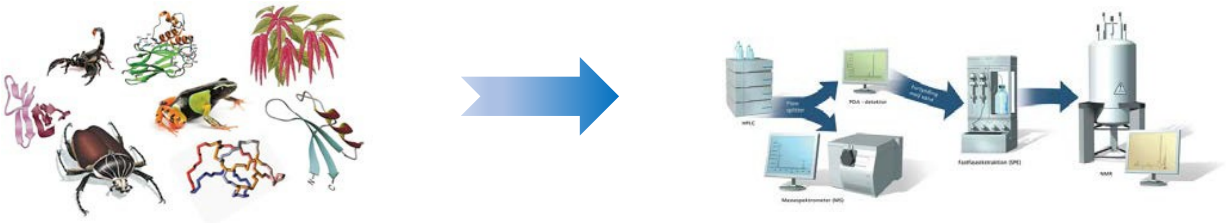


A typical project will involve:

- ✓ Collection of plants, seaweed, fungi, etc - followed by extraction of bioactive metabolites
- ✓ High-resolution biochromatography and HPLC-PDA-HRMS-SPE-NMR analysis
- ✓ Structure elucidation and pharmacological characterization of active molecules
- ✓ Collaborative project with stay at collaborators at University of South Australia Adelaide possible

Peptidomics – new bioactive peptides from nature

Peptides are recognized as important drug leads, and plants and animals have developed a variety of different peptides as toxins and signaling molecules. Peptidomics is a new discipline that aims at exploring the chemical and pharmacological properties of the peptidome.

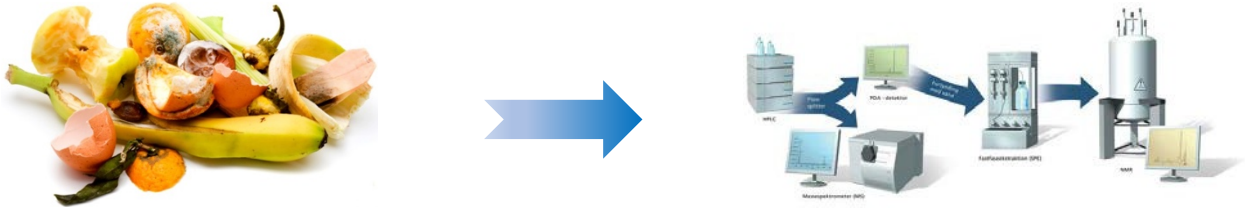


A typical project will involve:

- ✓ Collection of plants, fungi, insects, etc - followed by development of protein and peptide extraction methods, protein hydrolyzation, and screening for bioactive peptides against cancer cells, bacteria and fungi, efflux pumps (to combat cancer or microbial resistance), and T2D targets
- ✓ High-resolution biochromatography and HPLC-PDA-HRMS-SPE-NMR analysis
- ✓ Collaborative project with stay at NOFIMA in Oslo possible

Green and sustainable drug productione

Food byproducts are either directly or as growth media for endophytic fungi a source for green and sustainable production of new drugs. In this project we will use the above-mentioned bioanalytical techniques as well as ligand fishing and multivariate analysis to identify 'green' anticancer, antimicrobial and/or T2D drug leads based on sustainable sources as food side streams and fungal cultures hereof.



A typical project will involve:

- ✓ Collection of food waste products and/or side streams from the food industry
- ✓ Extraction of small-molecules and/or peptides from food waste or fungal cultures grown on food waste
- ✓ High-resolution biochromatography, ligand fishing and HPLC-PDA-HRMS-SPE-NMR analysis
- ✓ Isolation and structure elucidation of bioactive metabolites.