

# Potential Medicine from Norwegian Deep-Sea Materials

Isolation and Characterization of Secondary Metabolites from Norwegian Deep-Sea Materials: Enhancing Knowledge for Sustainable Research and Pharmacological Insights



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## Background and motivation

Natural molecules like plant-derived alkaloids, flavonoids, and terpenoids also serve as the basis for many medicines. Understanding these molecules helps scientists discover new drugs, enhance agricultural practices, and develop sustainable environmental solutions. Nature's vast chemical diversity offers endless potential for innovation in fields ranging from healthcare to biotechnology.

## Project description

Marine organisms play a crucial role in the development of pharmaceuticals and functional foods, offering bioactive compounds with therapeutic benefits. Some important drugs derived from marine sources include anticancer agents like cytarabine and trabectedin. However, research on the chemical components and their pharmacological effects from Norwegian deep-sea materials remains very limited to date. In this project, we will study secondary metabolites and their pharmacological effects from Norwegian marine organisms.

## Main questions

- What are the chemical constituents of Norwegian deep-sea materials?
- What are the bioactivities and pharmacological effects?

## Marine sustainability

My research on the metabolomics and natural product chemistry of Norwegian deep-sea organisms aims to uncover novel bioactive compounds with pharmaceutical potential while adhering to sustainability targets. By employing environmentally responsible extraction methods and focusing on underutilized species, I strive to minimize ecological impact and promote the conservation of marine biodiversity. This approach not only supports the discovery of new therapeutic agents but also aligns with sustainable practices that ensure the long-term health of Norway's rich marine ecosystems.

## Planned activities

I have collaborated with the Centre for Deep Sea Research at UiB to collect 'sustainable' marine samples such as sponges and starfish. I am studying secondary metabolites from these organisms. The pharmacological effects will be evaluated in collaboration with the Department of Clinical Science at UiB. The results will be published in SCIE academic journals and presented at conferences, alongside our academic and industrial partners. Additionally, this project will help train, mentor, and supervise one master's student in our group.

## Supervisory team

Supervisor: Assoc Prof. Monica Jordheim, Head of group Bioresources and Pharmaceutical Chemistry, Department of Chemistry, UiB.

Co-supervisor: Prof. Torgils Fossen, Department of Chemistry, UiB.

Prof. Lars Herfindal, Department of Clinical Science, UiB.

Prof. Ida Helene Steen, Centre for Deep Sea Research, Department of Biological Sciences, UiB

## Aims

- Metabolomic profiling: Identifying and quantifying metabolites in Norwegian marine organisms to understand their biochemical roles.
- Extraction and isolation: Using solvent extraction and chromatography to isolate bioactive compounds for analysis.
- Analytical and structure elucidation: Employing NMR, and mass spectrometry to determine the chemical structure of marine metabolites.
- Pharmacological effects: Screening marine compounds for therapeutic potential, including anti-inflammation, antimicrobial and anticancer properties.

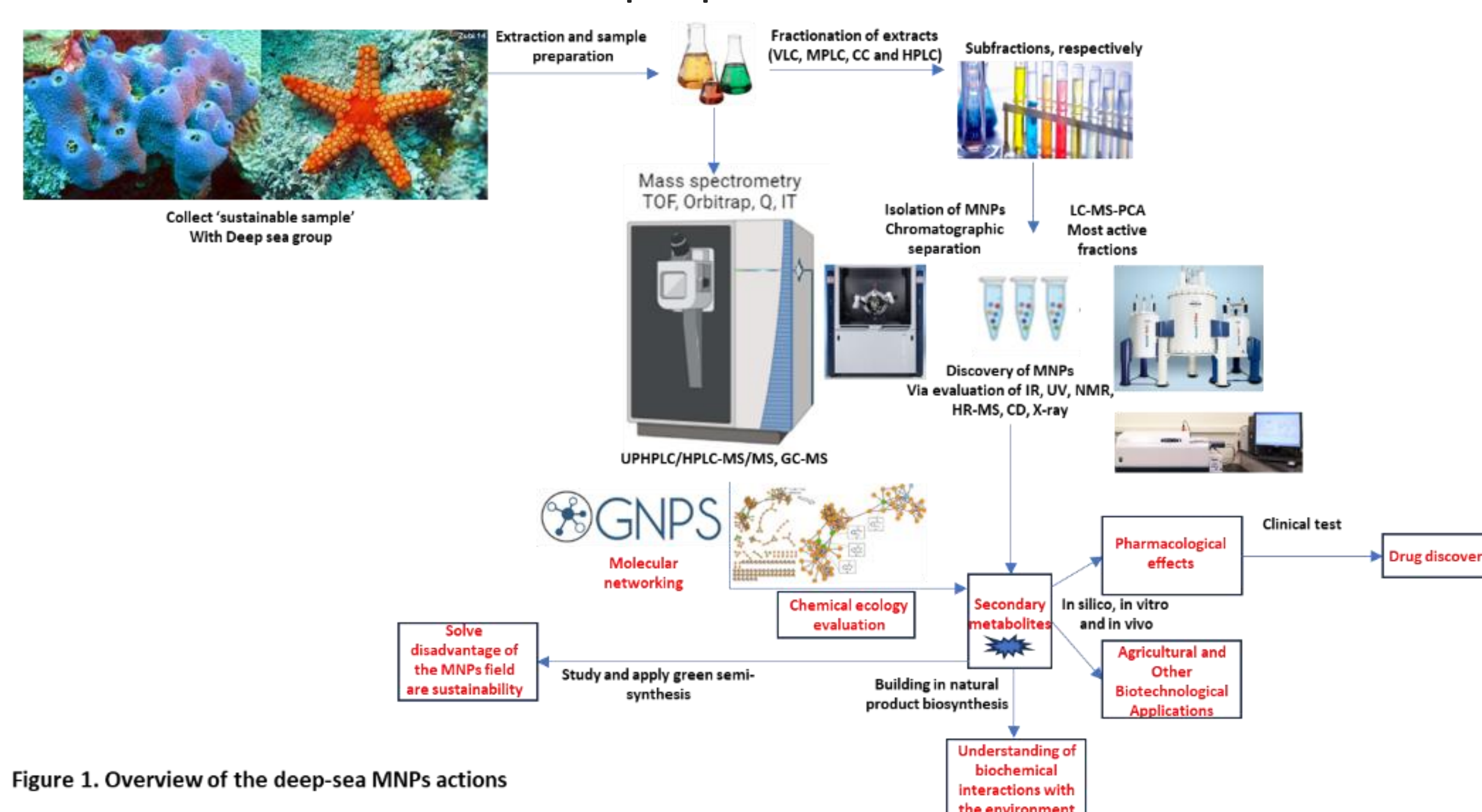


Figure 1. Overview of the deep-sea MNPs actions



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