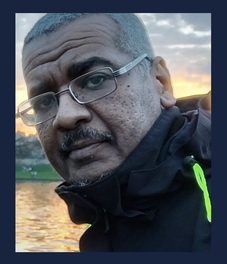
Marine aspects of human health

Possible marine environment impacts on human kidney disease



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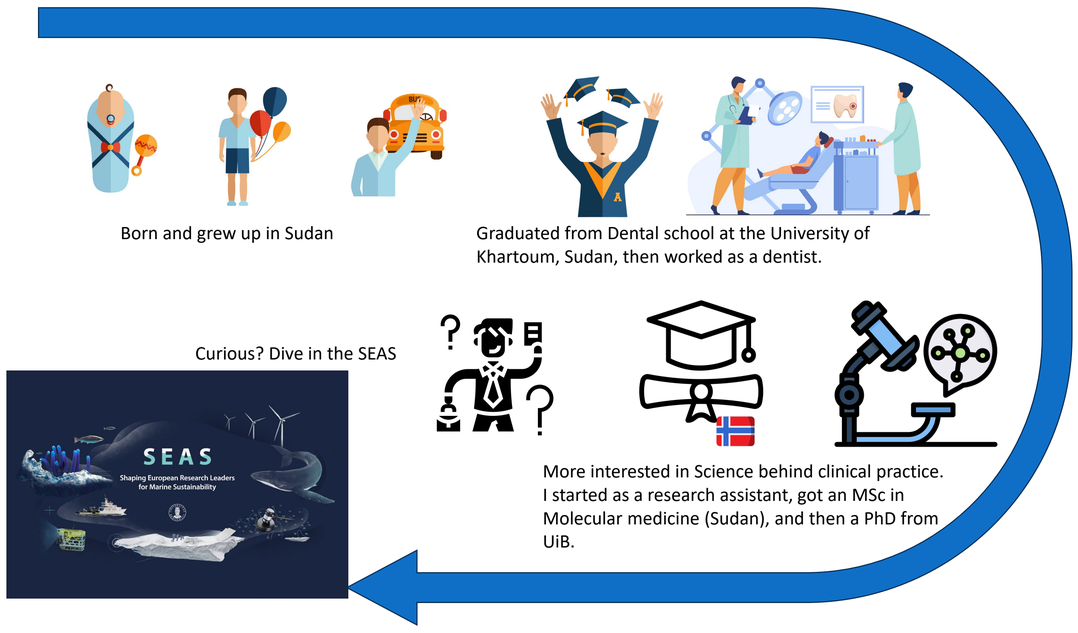
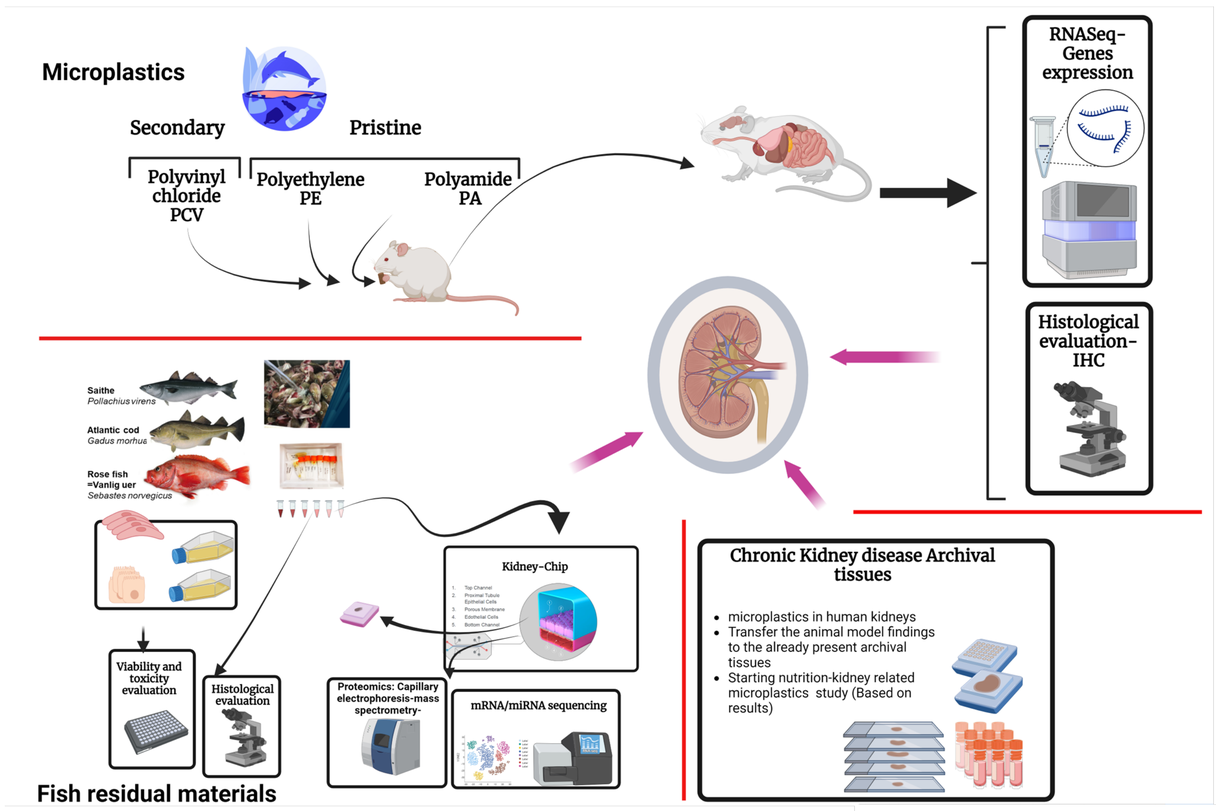
Background and motivation



Project description

My focus is to investigate marine environmental aspects of chronic kidney diseases.

We started by looking at the effect of fish residual material on kidney diseases fish residual material on human kidney disease, based on previous animal study models. Evaluation of the inflammatory response and different patterns of protein expressions. This is a step along further validation, towards clinical utilization of promising residual marine by-products to achieve sustainability. This part of the project is delayed due to a shortage of residual fish material and difficulties at the hosting lab for this type of experiment. We started recently considering another important aspect, which is the effect of microplastics on kidney health utilizing an animal model, fed standardized microplastics. The project was established at Jutta's Dierkes group at UiB. This recent project has a long-term aim to establish the exact impact of microplastics on the human kidney.



Main questions

- Do fish residual material have a positive effect on kidney cells? Can this be a base for a therapeutic approach?
- Does animal exposure to microplastics, through marine product consumption, impact gene expression (mRNA abundances) in the kidney.?

We might refine those, based on results based on feasibility and science rapid evolution.

Marine sustainability

- The main sustainable development tackled throughout this project is the UN SDG 3. “Ensure healthy lives and promote well-being for all at all ages”
- Others indirectly related to the project, or its anticipated outputs are highlighted in the figure

Aims/milestones

- Establishing a start-point for a microplastic study as relevant to kidney health.
- Starting a platform looking for utilization of marine byproducts to promote human health aspects.
- Scientific exposure to different research milieus who can contribute to the discipline’s development.
- Self-development to fulfil the SEAS main targets.

Activities and pilot results

- Outland stay at Jagiellonian University Krakow, Poland.
- Different workshops and courses:
  - **Courses with a focus on AI applications in research**.
  - **Courses designed by UiB library:** data management, systematic reviews.
  - **Writing workshop**: SEAS.
  - **Advanced statistics in different platforms** (Python, R, MATLAB).
- **Activity and SEAS connections :**
  - Usual lab experiments work as the project requires.
  - **Renal research group outreach:** website administration, Establishment of a group blog.
  - Internal collaboration UiB phone application development (within a team at medical faculty, UiB).
- **Some findings so far:**
  - Fish residual materials did not show any harmful effect, as measured by cell viability and confluence in wound-scratch assays),when tested directly on cultured human primary renal epithelial cells. We noticed some differences in the type of fish extract anatomical location (Head/intestinal/muscles). Scan the code and watch some movies for cells growing in the fish residual materials and extra pilot analysis.

Supervisory and collaborative teams:

Microplastics project: Hans-Peter Marti, Jutta Dierkes, Alice Refosco, Damaris Benny and Jessica Furriol (UiB)
Fish material Experiments: Hans Peter Marti, Oddrun Gudbrandsen, Piotr Mydel (Jagiellonian University), Daniela Elena Costea, Ole Petter Nordbø, Jessica Furriol (UiB).