

# Impact of Microplastics on Kidney Health

## Microplastics and Kidney Health; A Study on a Rat Model

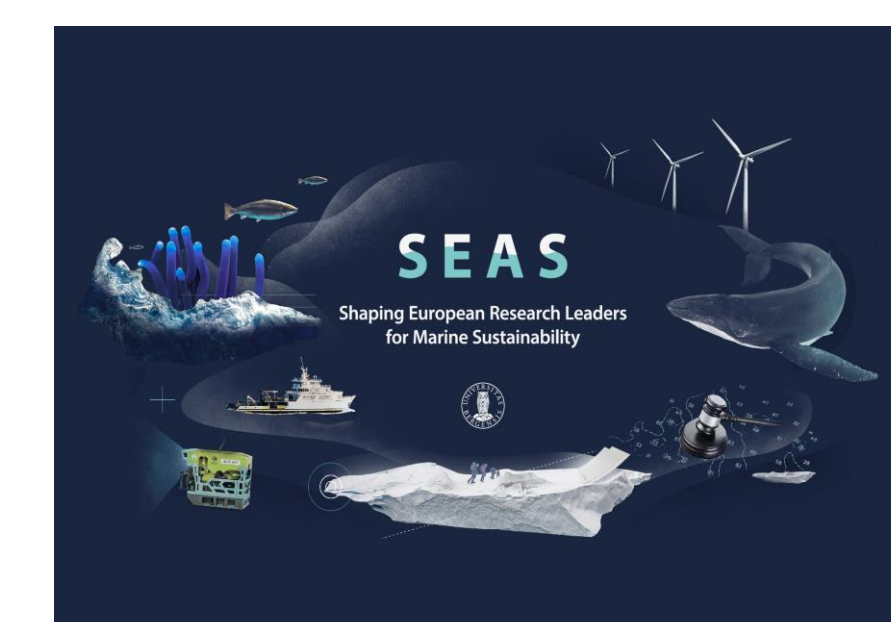
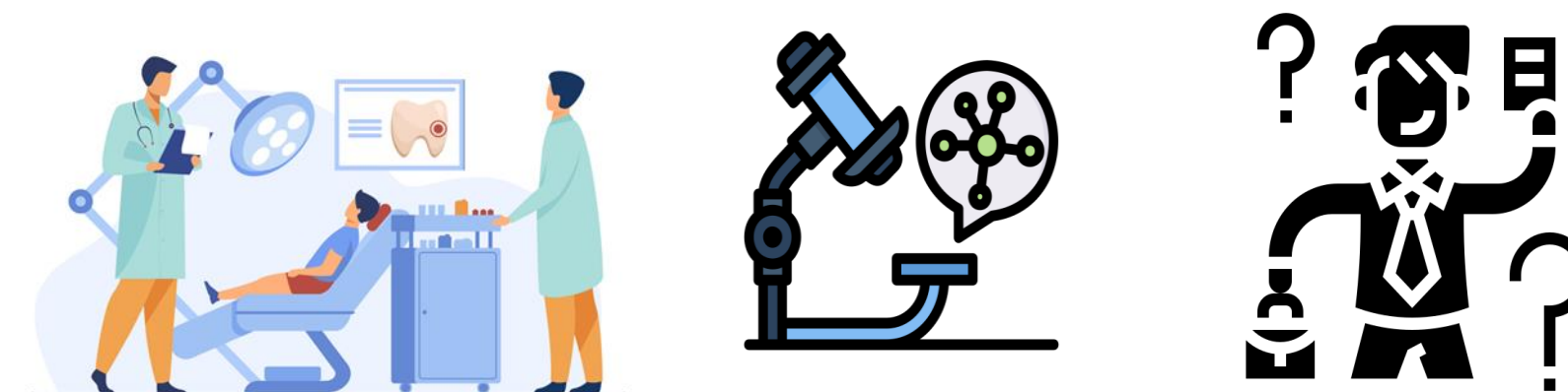


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### Background and motivation

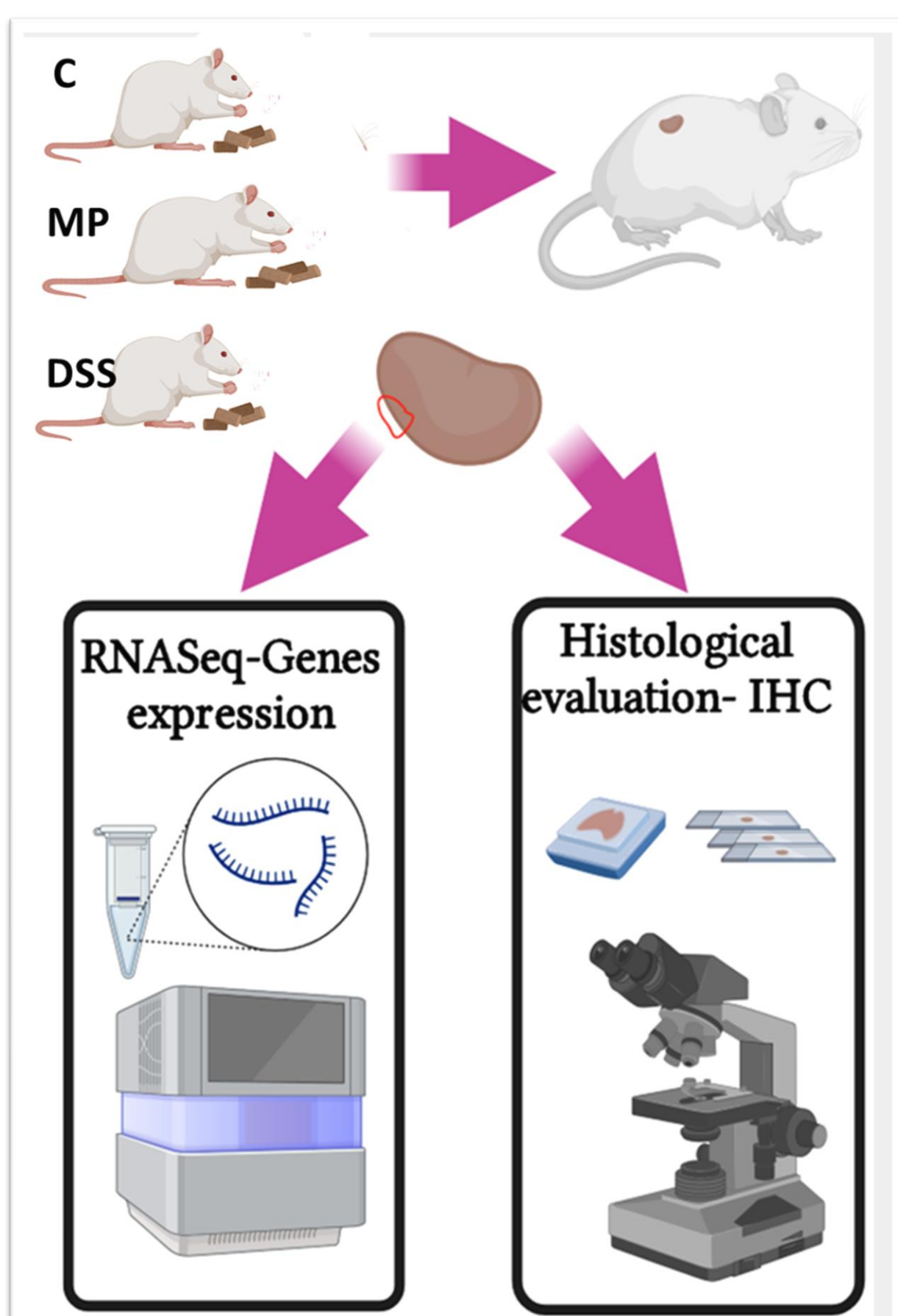
I was a dentist in Sudan who transitioned to research.

Scientific curiosity and quest for new knowledge were behind me joining SEAS program, with its diverse discipline.



### The Project

- Microplastics are found in everyday items like clothing, plastic containers, and food packaging. They can also be present in seafood, bottled water, beer, salt, and tea, potentially entering our bodies and causing health issues.
- Although the precise effects on human health are unclear, it is known that microplastics can be absorbed into tissues, body fluids, and organs. Research using lab animals helps to further investigate these effects.
- We are evaluating the impact of ingested microplastics on kidney health utilizing an animal model.
- It is a part of a larger project established at the Center for Nutrition, UiB.



**Experiment overview:**  
Study group (n=31), Rattus norvegicus.

- C control (n=8, 4 female, 4 male)
- DSS diet (n=8, 4 f, 4 m)
- MP (n=8, 4 f, 4 m)
- DSSMP (n=7, 3 f, 4 m)

DSS: dextran sodium sulfate, MP: Microplastic

### Marine sustainability

The main sustainable development tackled throughout this project is the UN SDG 3.

Other SDGs are indirectly related to the project, or its anticipated outputs.



### Main questions

- Can microplastics in diet affect the gene expression in kidneys?
- Can gut health impact the microplastics effect on kidney?

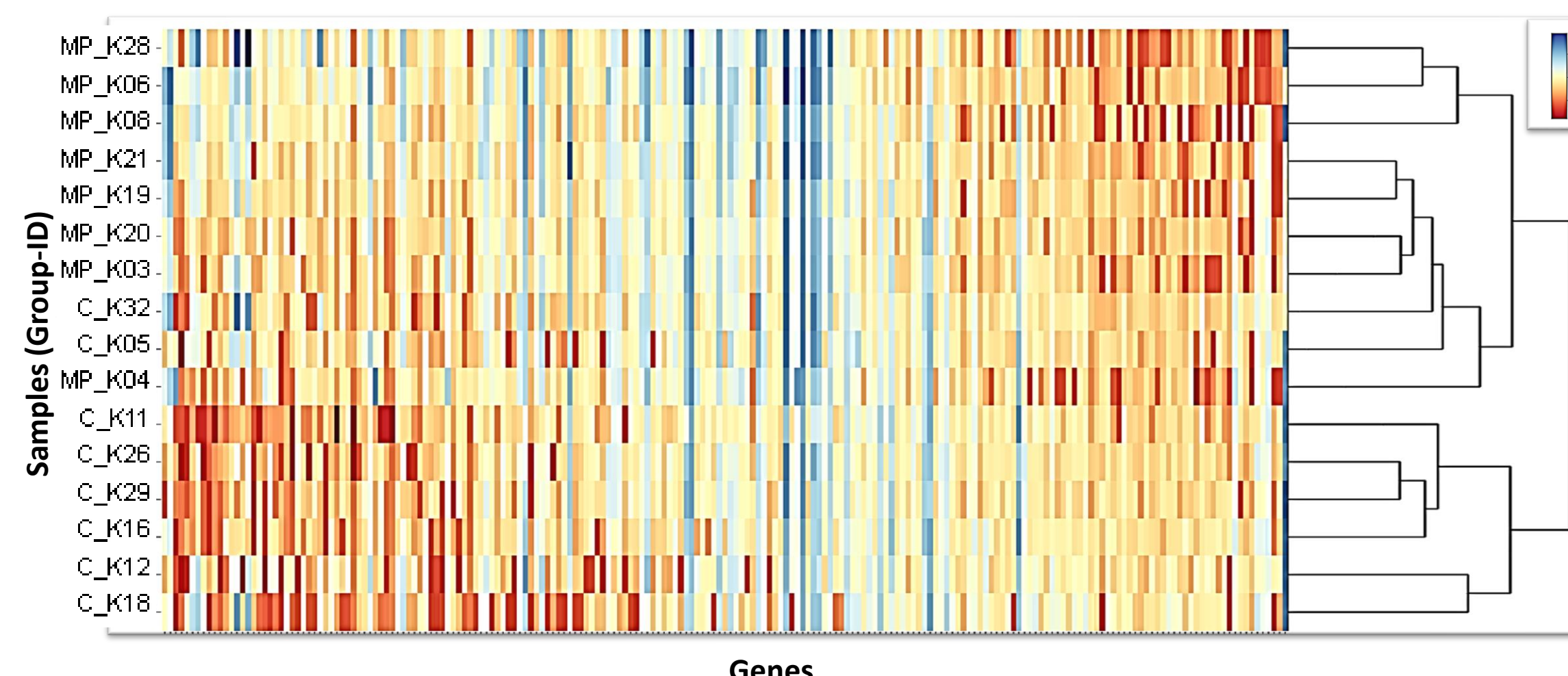
### Findings:

203 DEGs were significantly different between MP and C groups.  
164 DEGs were significantly different between DSS and DSS.MP group.

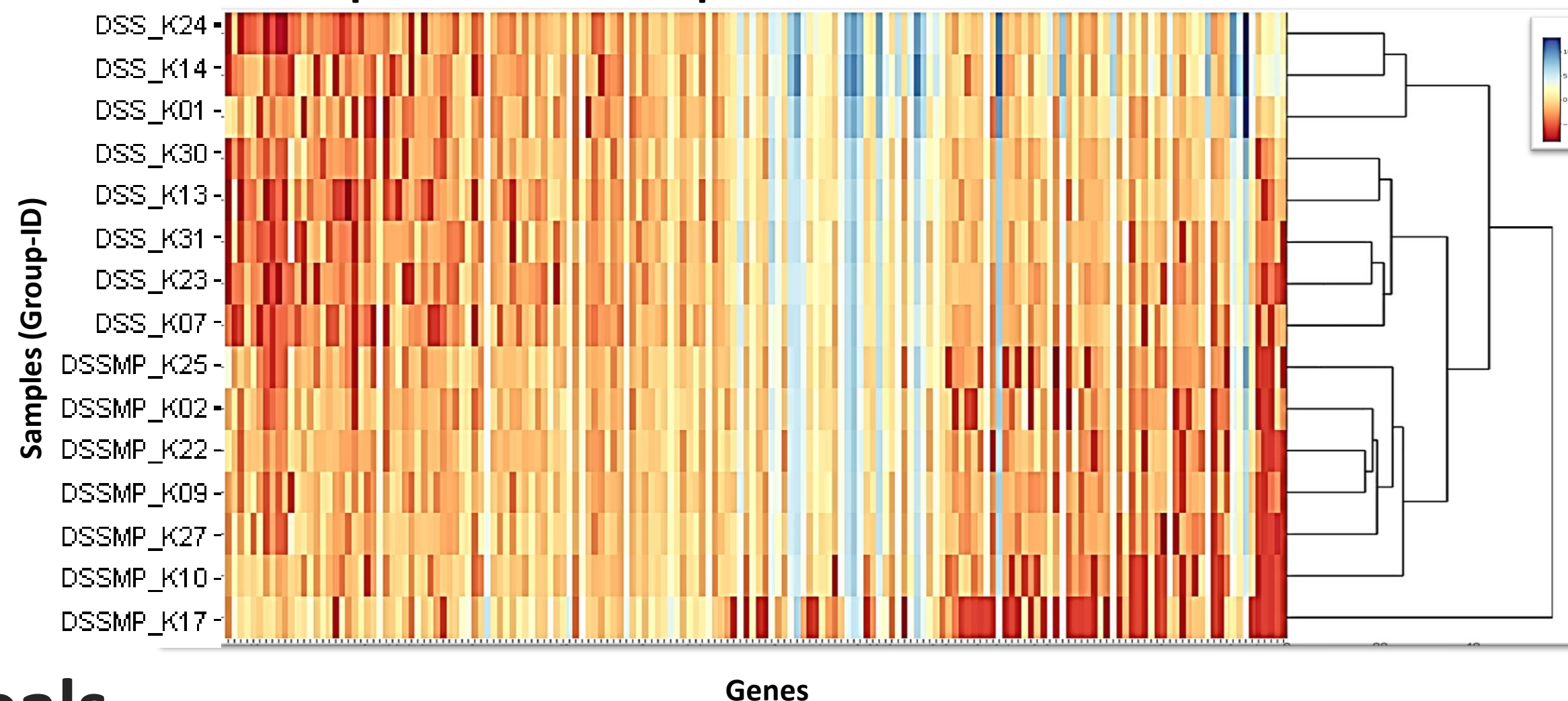
Ongoing analysis aims to identify disease associations, with plans for confirmation using immunohistochemistry.

We found important pathways related to kidney functions and diseases are altered between groups. *SCAN ME for extra info!*

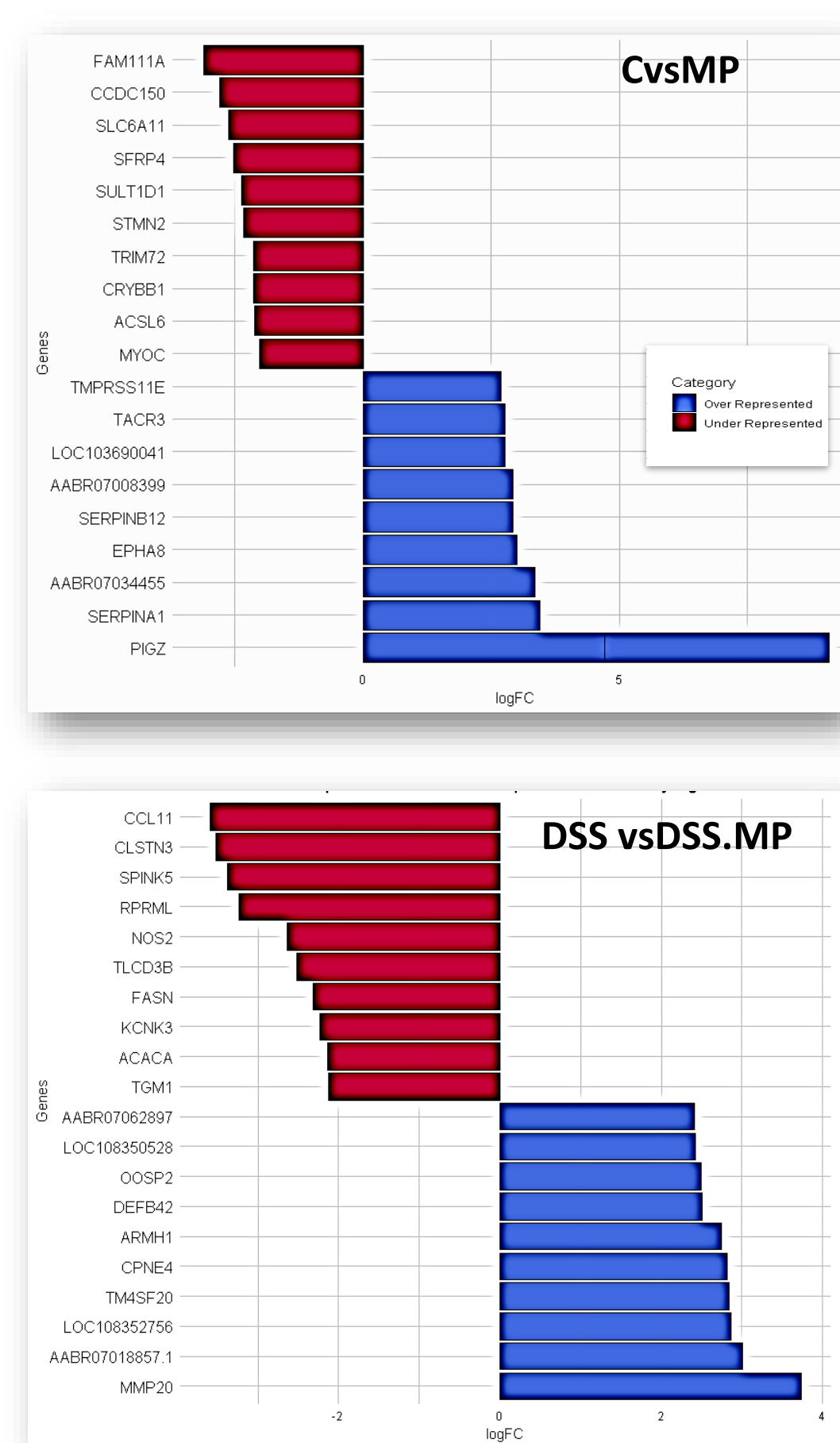
Gene Expression heatmap C vs MP



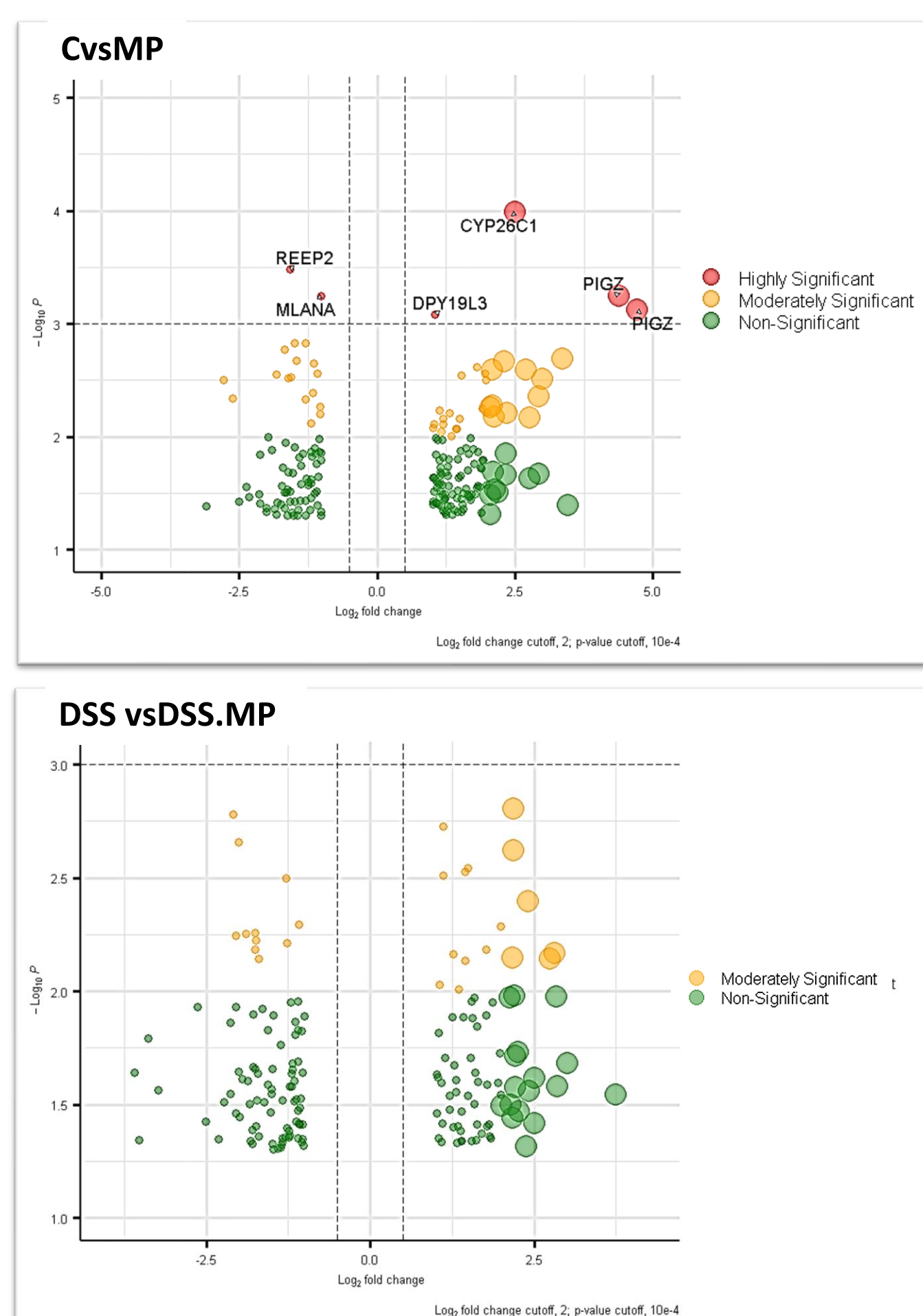
Gene Expression heatmap DSS vs DSS.MP



Top 10 Over and Under Represented Genes - logFC



Volcano plots



### Goals

- Establishing a start-point for a microplastic study as relevant to human kidney health, utilizing the findings from this study.
- Acquiring a deeper understanding of the research milieu that will contribute to the discipline's development.
- Self-development to fulfil the SEAS main targets.

### Supervisory team

Hans-Peter Marti, Jutta Dierkes  
Collaborators: Alice Refosco, Damaris Benny (SEAS fellow),  
Jessica Furriol (UiB).



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SEAS

