Problem statement

Disinfection by-products (DBPs)?
- Formed during the reaction of chlorine with natural organic matter
- > 700 different compounds identified
- Possibly harmful after exposure
- Organic matter precursors still inconclusive

Objective

1) Develop membrane fractionation protocol to isolate different organic matter fractions

2) Assess the disinfection by-product formation potential of each fraction

3) Perform hazard assessment on human primary intestinal epithelial cells

Hazard assessment (ULille)

Haloacetamides (HAcAm)
- Unregulated by law

Haloacetic acids (HAA)
- Regulated by law

IC50 = the DBP concentration that induces a 50% reduction in cell metabolic activity compared to a control group

Toxicity HAcAm > HAA
Toxicity I-DBP > Br-DBP > Cl-DBP

Successful isolation of low molecular weight compounds

Future perspective

- Further development of the membrane fractionation protocol to isolate the humic substances and the biopolymers
- Assess the disinfection by-product formation potential of each fraction
- Analyze the inflammatory response of identified DBPs on human cells