

## Characterization of genotoxic effects of chemical compounds by gene expression analysis of the nematode *Caenorhabditis elegans*

### Information:

**Very short:** Using *C. elegans* as a model organism to detect genotoxicity based on transcriptomic responses.

### The Challenge

Gene expression analysis of a model organism such as the nematode *C. elegans* can be a useful tool to identify biomarkers related to chemical exposure. The focus of this project is to evaluate gene expression changes in response to genotoxic exposure. Quantitative PCR (qPCR) will be used to analyze transcriptomic responses of *C. elegans* treated with genotoxic compounds. The goal is to identify the early marker genes predictive of genotoxicity induced by the tested toxicants.

### Background

Many water contaminants such as hydrophilic compounds remain undetectable by chemical analysis. This leads to uncertainties and challenges in the toxicological risk assessment for compounds which are potentially hazardous to human health and environment. Model organisms such as *C. elegans* can be used as a tool to determine the toxicity associated to the chemical exposure. Chemicals which are invisible by analytical methods will induce impairment of biological functions at a cellular level in those small animals. The focus of this research is to identify alterations in gene expression in *C. elegans* upon chemical treatment in order to predict genotoxicity of the tested compounds.

### The Task

In this project, the nematode *C. elegans* will be exposed to genotoxic model compounds followed by gene expression analysis using quantitative reverse transcription PCR (RT-qPCR).

### Skills required

You have some experience in molecular biology such as manipulation and analysis of nucleic acids (DNA and RNA) and qPCR. Your educational background in microbiology or nematology, is preferred. You will receive adequate trainings about the handling of *C. elegans* culture under laboratorial conditions and for conducting genotoxic exposure of the nematodes according to protocols.

### Who can apply?

You are a M.Sc. or a B.Sc. student with a background in Molecular Biology, Microbiology, Toxicology or other biology-related fields with an interest in the toxicological risk assessment of water contaminants.

**Allowance:** 350€ / month.

**Duration:** Minimum 5 months (**Start date:** January 2019. There is some flexibility in determining your start date)

**Location:** Wetsus, Leeuwarden, the Netherlands

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