

# Could endocrine disrupting chemicals (EDCs) affect fish reproductive health?

## 1. Introduction

EDCs are a large group of chemicals coming from **industrial and agricultural pollution** that are now found in the environment.

MXC<sup>1</sup>, BPA<sup>2</sup> and EE2<sup>3</sup> are among the known EDCs. They mimic the female hormone **estrogen**. Estrogens play a **key role** in the **reproductive functions** of fish. We investigated the **effects of EDCs** on the expression of the **brain aromatase gene (*cyp19a1b*)** in juvenile female Atlantic cod. *Cyp19a1b* is **involved in estrogen synthesis**.

## 2. Methods

- We **treated** female Atlantic cod (*Gadus morhua*) with each EDC (MXC, BPA, EE2) at **different concentrations** and collected **brain samples** after **three days** of treatment.
- We then **extracted RNA** from the brain samples.
- The **expression levels** of *cyp19a1b* was determined using a quantitative polymerase chain reaction (**qPCR**).
- **Statistical analysis** was performed using an ANOVA test in R (**Version 4.2.1**)

## 4. Discussion

- *cyp19a1b* gene expression increased with **exposure** to the tested compounds. *Cyp19a1b* is important for estrogen synthesis. This suggests the adverse effect of EDCs on reproductive functions of Atlantic Cod. **Other genes may also be affected.**
- Could **exposure in humans** lead to similar effects? It is worth investigating...

## 3. Results

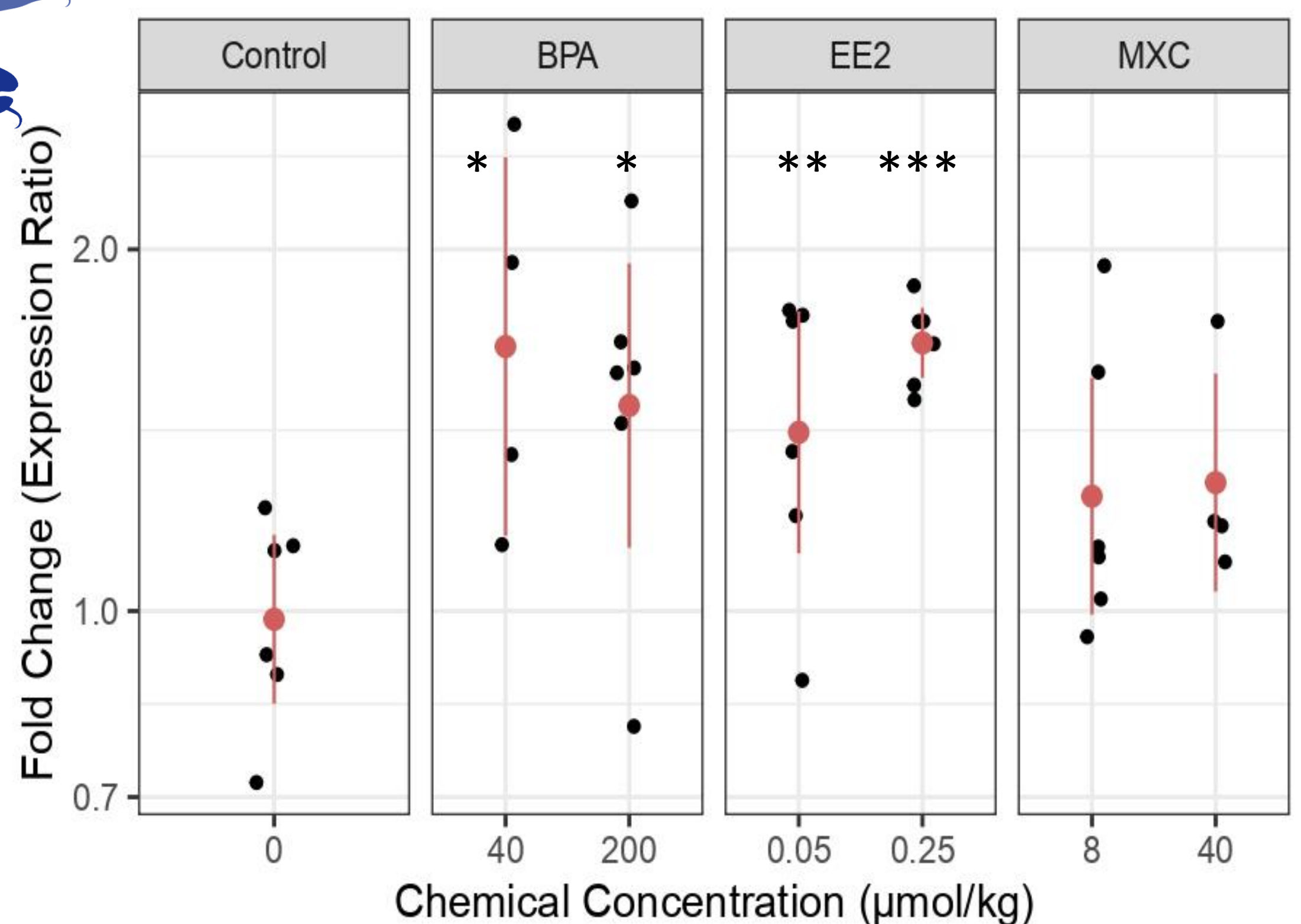


Fig 2: *cyp19a1b* expression ratio in the brain of female Atlantic cod after treatment with various concentrations of MXC<sup>1</sup>, BPA<sup>2</sup> and EE2<sup>3</sup>. The black dots represent the raw data. The red dots represent the mean expression ratio while the lines represent the two standard error. \* p-value < 0.05; \*\* p-value < 0.01; \*\*\* p-value < 0.001

- We can see a **significant upregulation** of *cyp19a1b* for samples exposed to BPA<sup>2</sup> and EE2<sup>3</sup>.
- MXC<sup>1</sup> exposure has a lower impact on *cyp19a1b*.

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