

## The effect of emerging pollutants in the North Sea on fish growth: An *in silico-in vitro* approach

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Environmental risk assessment is of extreme importance to assure a safe, balanced and sustainable use of chemicals, while playing a key role in environmental regulation. However, it currently relies on ethically controversial, expensive and time-costly methods and experiments (e.g. animal testing). Moreover, quantification of chemical toxicity is commonly based on external concentrations in water, soil or air, even though it is the internal concentration in the organism that gives rise to the biological effect. Recently, a combination of *in vitro* and *in silico* has been put forward as a viable alternative to the conventional *in vivo* testing. In this study, we have applied this concept to emerging pollutants detected in the North Sea, particularly pharmaceuticals and pesticides. We assessed the effect of these chemicals on growth impairment in fish through *in silico* methods, using predicted internal concentrations of these chemicals, based on environmental concentrations. In particular, we exposed gill cells of rainbow trout (*Oncorhynchus mykiss*), RTgill-W1 cell line, to the predicted internal concentrations of each chemical and then used the *in vitro* cell growth to predict *in vivo* growth. It is our believe that the adopted methodology allows the tackling of the previously described issues related to chemical risk assessment and encourages a shift of the current paradigm.

Keywords: In vitro; In silico; RTgill-W1; Growth impairment; Pharmaceuticals; Pesticides; North Sea