Levels of selected Pharmaceuticals and Personal Care Products (PPCPs) in seawater and biota associated with north Norwegian sewage treatment plants.

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Pharmaceutical residues and substances used in personal care products (PPCPs) are released into the aquatic environment under uncontrolled conditions. These are acknowledged as potential contaminants in sensitive aquatic environments, and the predominant source for these environmental pollutants is today identified as sewage treatment plants. Comprehensive international studies have proven that PPCP related substances (i.e. hormones, antibiotics, lipid regulators etc.) are associated with a variety of adverse effects both in the environment and humans (unintendently exposed). These adverse effects include endocrine disruption, teratogenic effects and resistance to antibiotics. Northern aquatic environments seem especially prone to these types of environmental consequences due to; 1) the general lack of full stage sewage treatment facilities, 2) the low year-round ambient temperatures leading to slow degradation and long half-live time for the respective contaminants.

Due to the above reasons, investigation, scientific risk assessment and monitoring of these environmental pollutants is an important focus in environmental research in order to assess implications for long-term exposure for humans and environment.

In this research, a multi-compound method was used for the quantitative trace analysis of relevant PPCPs in recipient seawater and associated biota (i.e. Saithe, Atlantic cod). The method for water samples is based on a solid phase extraction (SPE) of 1 L seawater sample followed by Liquid Chromatography Mass Spectrometry (HPLC/MS) quantification. Biota samples collected near the outlet location were extracted with Acetonitrile (ACN). Further clean-up included SPE before quantitative analysed with HPLC/MS was performed.

The biota and sea water samples were collected in October 2016 in the Tromssund region (Tromsø city) close to the sewage outlets at Breivika and the University Hospital (Universitetssykehuset i Nord-Norge = UNN). The samples are currently prepared for analysis. According to a previous investigation (Weigel et al., 2004) the concentrations are expected to be in the range of pg/L and ng/L in seawater samples. The results and potential environmental implications will be discussed in detail during the planned presentation.

Reference: