COMPLEMENTARY TARGET, SUSPECT AND NON-TARGET SCREENING OF BIOLOGICAL SAMPLES WITH LIQUID AND GAS CHROMATOGRAPHY – TIME OF FLIGHT MASS SPECTROMETRY

ROSTKOWSKI P.[1*], LANGFORD K.[2*], ROHLER L.[1*], REID M.[2*], SCHLABACH M.[1] and THOMAS K.[2]

[1]NILU – Norwegian Institute for Air Research, Kjeller, Norway, [2]NIVA – Norwegian Institute for Water Research, Oslo, Norway
* - joint first authors
Email: pr@nilu.no

A 2012 study, initiated by the Norwegian Environment Agency tested the applicability of a non-target screening approach for selecting relevant environmental contaminants for subsequent targeted monitoring campaigns (1). This proved to be useful and a number of different pollutants identified as present in various environmental matrices become a subject of screening campaigns in the following years. However, due to the complexity of the matrix a substantial number of substances remained unidentified. Increased interest in this approach amongst the environmental community has been paralleled by the development of tools, both on the hardware and software side, that are more tailored towards this application. In this study, biological samples from different trophic levels (for example smelts, prawns, cod, krill, zooplankton, herring, and trout) were extracted in a manner that maximized the recovery of chemicals with different physico- chemical properties. Complementary analytical techniques, such as high and low resolution time of flight mass spectrometry (TOF-MS) combined with either ultra-high-performance liquid chromatography (UPLC), or gas chromatography (GC) or multidimensional gas chromatography (GCxGC) were used with a target, suspect and non-target screening approaches to analyze and identify relevant environmental pollutants in these organisms.

Keywords: suspect screening, non-target screening, time of flight mass spectrometry, environmental contaminants

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