Biomarker response and plasma-Protein Expression Signatures (PES) in mussels (*Mytilus edulis*), cod (*Gadus morhua*) and turbot (*Scophthalmus maximus*) exposed to PBDE-47, Bisphenol A and DAP.

Odd-Ketil Andersen[1].

RF-Akvamiljo, Mekjarvik 12, 4070 Randaberg, Norway.

The objectives of this study were to study the effects of these potential endocrine disrupting chemicals on by measuring a wide range of biomarkers and determine PES in several marine species. The organisms were kept in a continuous flow system exposed through the water supply for 3 weeks to 0,23 µg/l tetrabromodiphenylether (PBDE-47), 59 µg/l Bisphenol-A (BPA) and 38 µg/l diallyl phthalate (DAP).

The exposure experiment were part of a large EU project, BEEP, with 30 participating Institutes. Many biomarkers of exposure and effects have been measured, and the presentation will focus on the ones showing response to the PBDE 47 and compare with the other chemicals. Body-burden and bioaccumulation of PBDE was measured. Several DNA damage methods was measured, phase I and Phase II enzyme activity has been measured along with oxidative stress and histological examination of tissue samples.

To identify PES, plasma from 60 individuals (30 males, 30 females) per exposure group, and species were analysed using a high-throughput surface-enhanced laser desorption ionization (SELDI) mass spectrometry technology based on ProteinChip arrays. A comparison of protein profiles in control- and exposed mussels revealed 33 significantly ($p<0.05$) up-regulated and 18 down-regulated plasma proteins in mussels exposed to DAP, 30 up-regulated and 9 down-regulated proteins in PBDE-47-exposed mussels, while 21 proteins were up-regulated and 38 down-regulated in mussels exposed to BPA. Different response patterns were observed in males and females. For example 19 proteins were induced in females exposed to BPA, while only 7 proteins were induced in males. Some proteins were affected by all exposures, however, certain proteins were found to be chemical-specific. These proteins used as protein expression signatures may have a useful role to play in environmental monitoring and risk assessment.

* The research was supported by the Norwegian Research Council and the European commission (via the BEEP program).