TU187 Molecular Toxicity of Metal Mixture and Defense Mechanisms in Zebrafish (Danio rerio). S. Majid, University of Antwerp, Dept. Biology; K. Smeets, Hasselt University / Centre for Environmental Sciences; R. Blust, University of Antwerp Faculty of Sciences. Metals play a pivotal role in various biochemical and physiological processes. They are widely found in nature, particularly in mineral deposits, soils and sediments. Virtually, all metals, including the essential metal micronutrients, are toxic to aquatic organisms if exposure levels are sufficiently high. The toxicity of the most important metals such as Cu, Zn, Ni, Pb, Cd, etc have been extensively documented for various species and the results are used to derive environmental standards. Most of the studies on metal toxicity consider the effects of single metals with little attention to mixture scenarios. In the natural environment the organisms are exposed to different metal compounds simultaneously, thus making it necessary to study combined metal exposures. In this perspective, we studied the toxicity of mixed metals and the underlying molecular mechanisms to provide new insights in generic versus metal specific stress responses. This study aimed to understand how exposures in a single and multiple metal pollution contexts differentially affect the zebrafish. In this experiment, fish were exposed to 50?g/L of Cu, 25?g/L of Cd and a 50+25?g/L Cu+Cd mixed dose for a period of 7 days. Fish gills, gut and liver were collected for metal analysis by ICPMS and gene expression of selected genes by qPCR. 16 genes were selected related to energy metabolism, oxidative stress, apoptosis, membrane transport and DNA damage and repair. We observed a strong response of genes in both single and combined exposures. Out of the total of 16 genes, 14 genes responded to the combined exposure in gills, 11 in gut and 14 in liver. A notable up regulation of Catalase, MT2, HSP70, SOD1, SOD3 was observed in different organs. Also an interesting response of DNA damage and repair genes Gadd45 and Rad51 was observed in mixed exposure in gill and liver which suggests a possible impact on DNA. Overall there was clear evidence that combined metal exposure resulted in synergistic response profiles at the gene expression level.