TU037 Mixture toxicity of copper and cadmium in the zebrafish (Danio rerio) K.I. Cordery, Universiteit Antwerpen / Biology; S. Husson, University of Antwerp / Biology; E.E. Smolders, KULeuven - BE0419.052.173 / Department of Earth Environmental Sciences; K. De Schamphelaere, Ghent University (UGent) / Applied Ecology and Environmental Biology; R. Blust, University of Antwerp. The uptake and toxicity of metals is well characterized for a number of aquatic species and this information is used to develop environmental quality standards. Most studies performed so far have focussed on single metal exposures, however in the environment exposure is often more complex including multi-metal exposures. In this study we have investigated the uptake and toxicity (mortality) of copper (Cu) and cadmium (Cd) in adult zebrafish (*Danio rerio*) on the basis of 10-day single compound and binary mixture exposure experiments. The experiments were conducted according to a partial factorial design covering a wide range of exposure concentrations and different water types ranging from very soft to very hard. In the single metal exposure the zebrafish were generally much more sensitive to Cu than to Cd and the toxic effects showed a strong dependence on water chemistry. Exposure of the fish to binary mixtures of the metals resulted in a very strong increase in metal toxicity, which was much higher than expected on the basis of classical mixture toxicity models such as concentration addition, i.e. Cu and Cd interacted synergistically . The body concentrations of Cu and Cd in zebrafish also strongly depended on the exposure scenario but there was no evidence of a strong Cu-Cd interaction for uptake. As a result expression of metal toxicity in terms of internal metal loading only partially explained the observed toxicl effects. These results demonstrate that metal interactions can have strong toxicological impact and that the observed mixture effects must imply synergistic interactions at the level of the homeostatic regulation and internal processing of the metals. More research is needed to identify if such interactions occur at low levels.