TU109 Effect of thermal prehistory and regime on metal toxicity in the zebrafish (Danio rerio) A. Pilehvar, Antwerp university / Biology; K.I. Cordery, Universiteit Antwerpen / Biology; R. Blust, University of Antwerp / Systemic Physiological and Ecotoxicological Research Department of Biology. The zebrafish has become a valuable vertebrate model organism in a wide range of biological research including ecotoxicology. Although there are several studies on metal toxicity in zebrafish, the effect of thermal background on metal toxicity is poorly documented in this and other model species. Changes in environmental temperature can profoundly change species physiological condition in different ways. In this study we explore whether different temperature regimes affect the organism tolerance against metal toxicity. For this purpose, we defined two main thermal scenarios: **1**.**Temparature shock:** in which fish were exposed to 5 different temperatures (17, 22, 25, 32 and 34 °C) and subsequently exposed to metal spiked waters with Cu, Cd or Cu+ Cd for 10 days. **2. Acclimation:** in which fish were acclimatized to 5 different temperatures for 28 days and then challenged by the same metals or mixtures for another 10 days. The condition of the fish was followed during the experiment, including behavioral and physiological metrics and also water quality was monitored. At the end of the exposure period, whole body metal and major cation (Na, K, Ca and Mg) concentrations were determined using ICP-OES or MS. The results showed that copper was much more toxic than cadmium towards the zebrafish in the medium hard water. However, copper and cadmium together showed a large synergistic effect in the mixture exposures. Fish which experienced a cold temperature challenge had a significantly better tolerance against single and mixture metal toxicity compared to the ones that endured an increased temperature challenge. In single exposures the total body burden of Cu and Cd was significantly higher in high temperature treated fish in comparison to the cold treated ones, but total body burdens is not a good predictor of effect. Analysis of the major electrolytes composition of the body shows that survival strongly depends on the capacity to maintain Na balance. Such an effect was not observed for the other major cations under the metal stress scenarios. The results of these experiments show that the thermal prehistory and temperature regime plays an important role in determining the tolerance of zebrafish towards the effects of metal exposure.