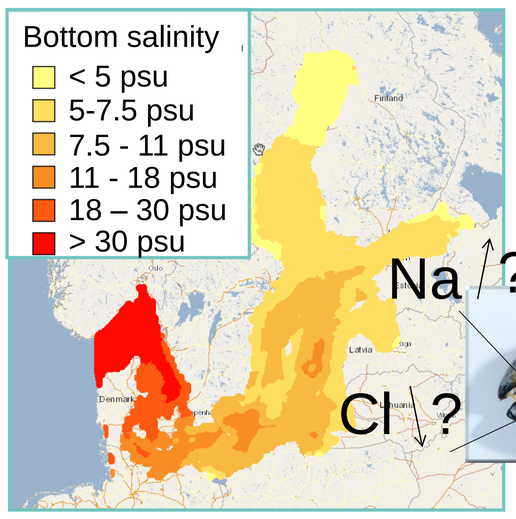
Addressing emerging issues in marine metal ecotoxicology with novel analytical techniques

Michiel Vandegehuchte[1], Jan Garrevoet[2], Lien Nguyen[1], Karel De Schamphelaere[1], Laszlo Vincze[2] and Colin Janssen[1]

[1]Laboratory of Environmental Toxicology and Aquatic Ecology, [2]X-ray Microspectroscopy and Imaging group, Ghent University, Michiel.Vandegehuchte@UGent.be

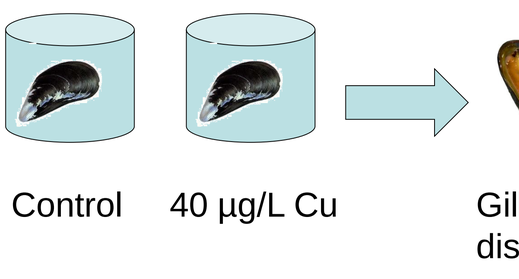
Introduction

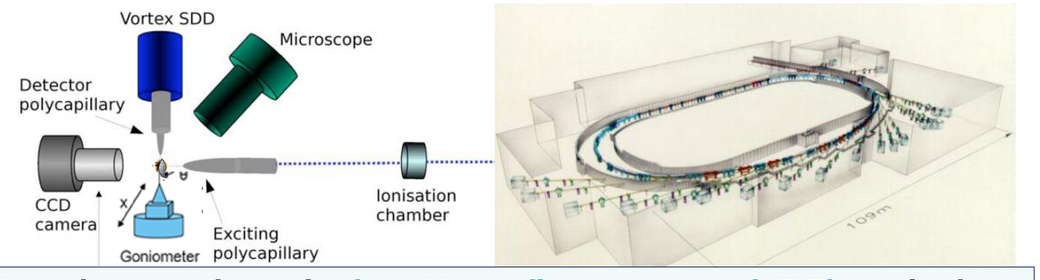


Transitional waters
How does metal ecotoxicology interact with animal **physiology** (elemental homeostasis)?

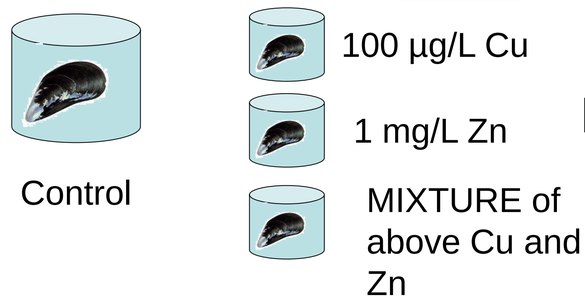
Metal mixture toxicity
Synergistic or antagonistic effects?
Mechanisms? Effects on physiology?

Materials & Methods



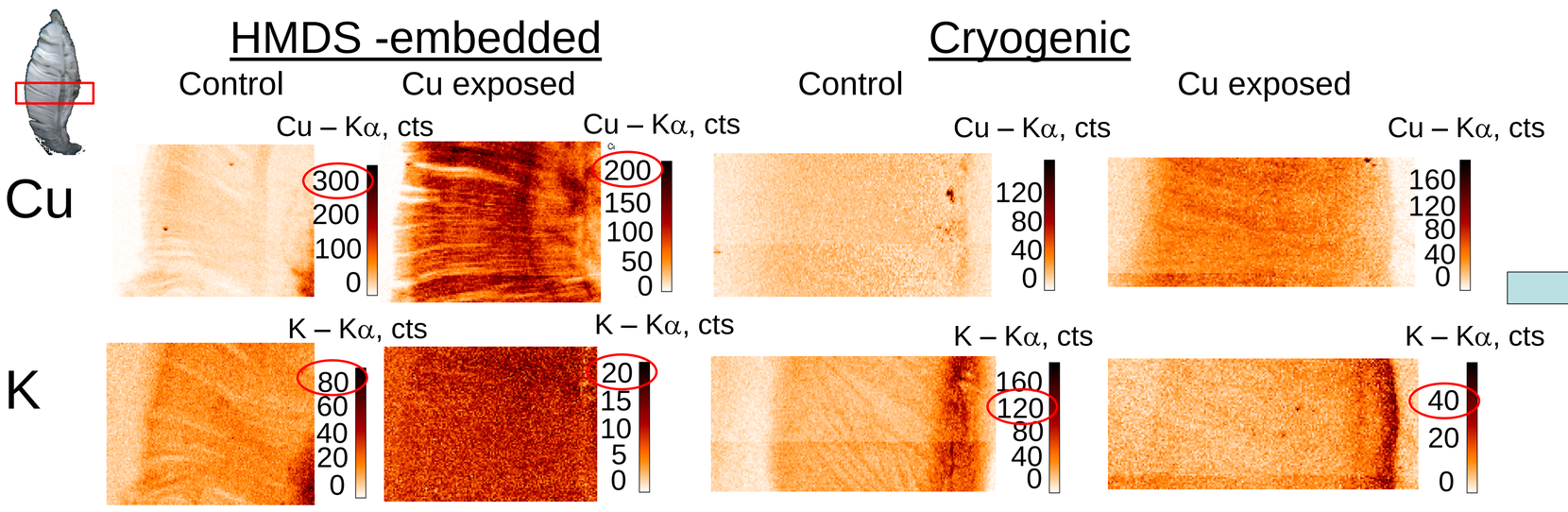


Synchrotron-based micro X-ray-fluorescence (XRF) analysis at HASYLAB, Hamburg



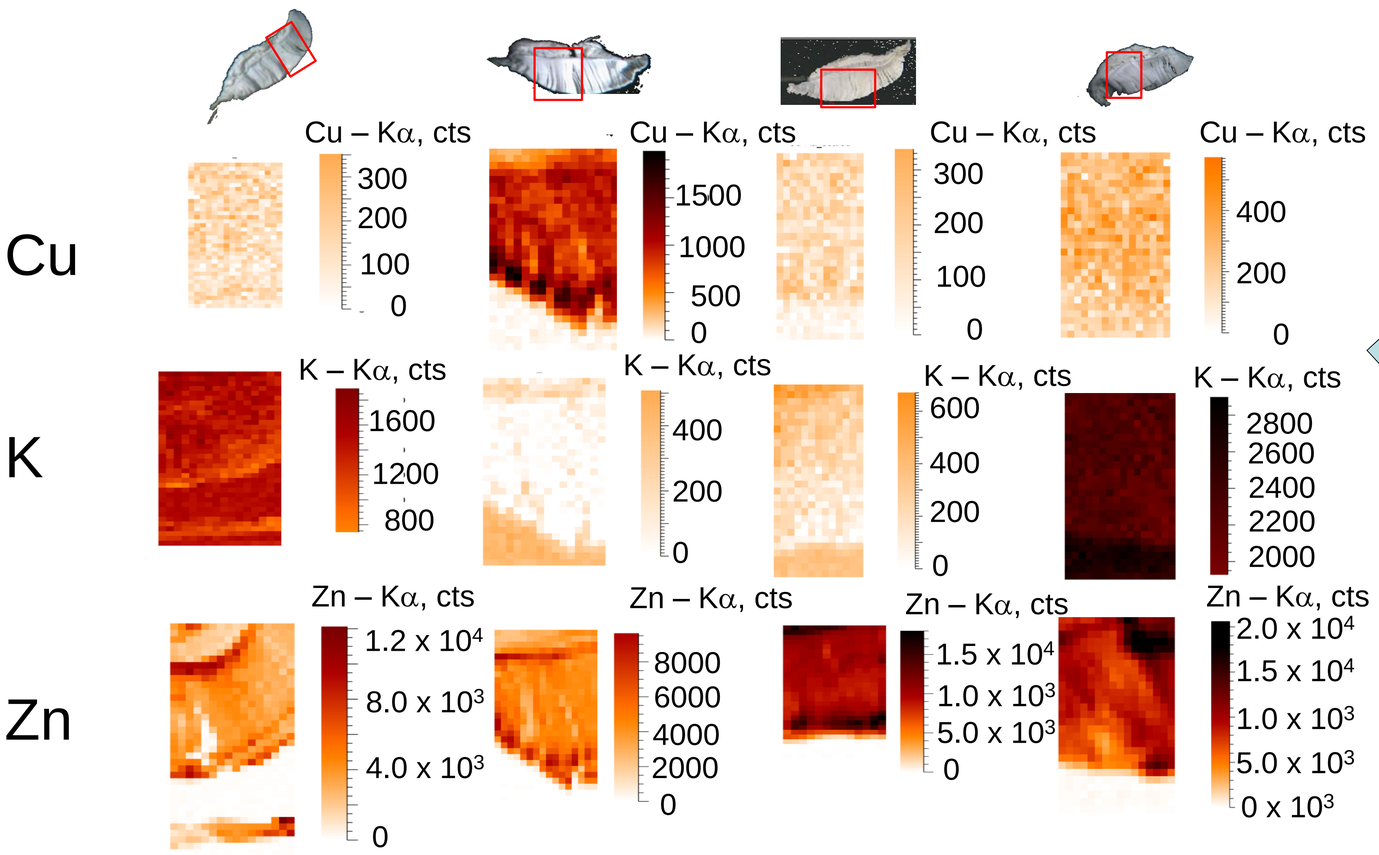
Laboratory-source micro XRF analysis at UGent

Results & Discussion



HMDS embedding: good sample preparation technique

Cu accumulation and K depletion in gill of Cu exposed mussels



Mussels exposed to **mixture** of Cu and Zn:
- Less Cu accumulation than Cu only exposure
- No K depletion
- Zn accumulation comparable to Zn only exposure

Conclusion

Micro-XRF

↳ **Mechanistic knowledge on physiological effects of metal toxicity**

Different physiological consequences of metal mixture exposures versus single metal exposures

Acknowledgement: This work has been financially supported by the European Copper Institute, the International Copper Assocation and by a BOF GOA grant from Ghent University. Tu Nguyen Thi Minh is gratefully acknowledged for experimental assistance.