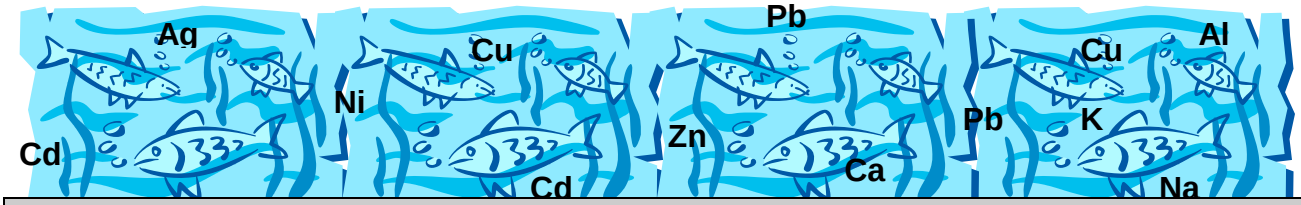
NSERC – Industry Project on Metal Bioavailability
Research Newsletter



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NEWS

The aim of this newsletter is to report on people and the projects they are working on. This edition will be delightfully short, just a quick recap of what's been going and a list of platforms and posters being presented at the SETAC North America 35th Annual meeting in Vancouver.

Comings and goings (June 2014 – Nov. 2014):

In Smith's lab, **Rabia Nasir** is one of the first PhD students in Laurier's new Biological and Chemical Sciences Doctoral program. Rabia will continue the work she started last summer investigating silver binding to dissolved organic matter focusing on the potential reactivity of reduced sulphur binding sites. **Elissa Dow** is a new MSc student who will be working on Ni binding studies to marine organic matter using fluorescence and ion selective electrode methods. **Kaijia Xin** is busy with her undergraduate Honours thesis research studying organic matter molecular structure from the Amazon and the Northwest Territories (samples thanks to Ora Wood and Jenn Baltzer respectively). **Kelly Livingstone**, an alumnus of both the McGeer and Smith labs, has gone onto a position as Marketing Research Chemist at Netchem in Brantford Ontario.

Chris Wood has now officially retired from McMaster University and given up his Canada Research Chair in Environment and Health (Sept. 1, 2014), but he remains an Emeritus Professor of Biology and Lifetime Distinguished University Professor. His McMaster lab will close in summer 2015 after the remaining two Ph.D. students (Alex Zimmer and Tamzin Blewett) finish their thesis research. However he has now started a new program as an Adjunct Professor in the Dept. of Zoology at the University of British Columbia, Vancouver, where he has an active lab with postdoctoral fellow **Dr. Anne Crémazy**, sabbatical visitor **Dr. Sigal Balshine** (a fish behaviour expert from McMaster University), NSF International Postdoctoral Fellow, **Dr. Kevin Brix**, and Ph.D. student **Marina Giacomin**. Marina was formerly a visiting graduate student on our IDRC International Research Chair Program at McMaster University. Adalto Bianchini (Federal University of Rio Grande, Brazil) and Chris Wood are pleased to announce that their joint International Research Chair Program on coastal zone management in Brazil has been funded for an extra 2 years (7 years total) by IDRC Canada. Former M.Sc. student and research assistant in the Wood lab, **Margaret Tellis** now works for ANZA, a capacity building NGO in Tanzania, as their communications and partnerships coordinator. **Michael Lim** who was a 4th year Honours research student in the Wood lab has now started an M.Sc. position under Dr. Joanna Wilson at McMaster University, examining the impact of thermal discharges from nuclear power plants on the development of the round whitefish. **Erin Leonard**, who was a Ph.D. student in the Wood lab, is now a postdoctoral fellow with Dr. Patty Gillis, Environment Canada, examining the responses of freshwater mussels to complex effluents. **Lygia Nogueira**, who was formerly a visiting graduate student on our IDRC International Research Chair Program at McMaster University, has won an 18 month CAPES Sciences without Borders Postdoctoral Fellowship, and will be joining the Wood lab at UBC next spring. **Kevin Brix** has accepted a joint appointment to the School of Environmental Studies and Department of Biology at Queen's University as an Assistant Professor starting in July 2015.

The McClelland lab, **Sheridan Baker** finished his BSc project and has joined the lab as a MSc working on Cu as a respiratory toxicant in killifish. **Adam Kulesza** has started an undergraduate project examining the effect of Cu on aerobic performance in killifish.

Upcoming presentations at SETAC 2014, in order of appearance:

- Crémazy A., Leclair S., Mueller K., Vigneault B., Campbell P.G.C., Fortin C. Development of an in situ ion exchange technique for the determination of free Cd, Co, Ni and Zn concentrations in fresh waters.
  PLATFORM 242. Monday 10th Nov. 1300. Rm 213-214.

- Blewett T., Smith D.S., Wood C.M., Glover C. Ni effects on the development of the New Zealand sea urchin *Evechinus chloroticus*.
  PLATFORM 237. Tuesday 11th Nov. 0820. Rm 213-214.

- Cooper C.A., Nasir R., McGeer J., Smith D.S. Influence of dissolved organic carbon concentration and source on chronic 7-d Ni toxicity to the mysid (*Americamysis bahia*).
  PLATFORM 238. Tuesday 11th Nov. 0840. Rm 213-214.

- Smith D.S., Livingstone K., Chen W., Gueguen C., Santore R.C., McGeer J. Influence of estuarine dissolved organic matter of variable source on Zn toxicity to hydra (*Eudendrium carneum*) and speciation measured by AGNES.
  PLATFORM 240. Tuesday 11th Nov. 1000. Rm 213-214.

- Niyogi S., Blewett T, Chris Wood C.M. Effects of salinity on short-term zinc uptake, accumulation and sub-lethal toxicity in the European Green Crab (*Carcinus maenas*).
  PLATFORM 241. Tuesday 11th Nov. 1020. Rm 213-214.

- Wood C.M., Nogueira L,., Nadella S.R., Loro V.L. Toxicity, bioaccumulation and ionoregulatory impacts in *Fundulus heteroclitus* exposed to waterborne zinc at different salinities.
  PLATFORM 242. Tuesday 11th Nov. 1040. Rm 213-214.

- Santore R.C., Ryan A.C., DeForest D.K., Brix K.V., Chowdhury M.J. A review of the bioavailability and toxicity of lead to aquatic organisms in acute and chronic exposures.
  PLATFORM 332. Tuesday 11th Nov. 1400. Rm 213-214.

- DeForest D.K., Brix K.V., Elphick J.R., Rickwood C.J., deBruyn A.M.H., Tear, L.M., Gilron G., Hughes S.A., Adams W.J. Selenium Partitioning between Water and Fish Tissue in Freshwater Systems: Development of Water-based Selenium Screening Guidelines.
  PLATFORM 334. Tuesday 11th Nov. 1520. Rm 213-214.

- DeForest D.K., Pargee S.M., Claytor C., Canton S.P., Brix K.V. Biokinetic food chain modeling of waterborne selenium pulses into lotic waters: implications for acute water quality criteria.
  POSTER TP081. Tuesday 11th Nov. Exhibit Hall.

- Duncan J., Newman E., Nasir R., Livingstone K., Smith D.S., McGeer J.* Salinity and dissolved organic matter modulation of metal toxicity to the hydroid *Eudendrium carneum*.
  POSTER TP109. Tuesday 11th Nov. Exhibit Hall.

- Santore R.C., Santore R., Smith D.S. Copper speciation and binding by natural organic matter in marine waters at ambient and acidified pH.
  POSTER TP110. Tuesday 11th Nov. Exhibit Hall.

- Lim M., Zimmer A.*, Chris Wood C.M. Using copper and ammonia co-exposures to elicit the toxic mechanism of waterborne copper (Cu) in freshwater rainbow trout (*Oncorhynchus mykiss*).
  PLATFORM 523. Wed. 12th Nov. 1340. Rm 213-214.

- Merrington G., Peters A.*, Smith D.S, Lofts S., Nasir R., Alshammari M. Understanding the chemical speciation of silver from the use of personal care products in aquatic freshwater systems.
  POSTER WP097. Wed. 12th Nov. Exhibit Hall.

- Brix K.V., Tellis M., Wood C.M. Uptake of Binary Metal Mixtures in Rainbow Trout: Expected and Unexpected Interactions.
  PLATFORM 623. Thurs. 13th Nov. Rm 213-214.

- Vilarinho G.C., Giacomin M.M.*, Castro K., Duarte R., Ferreira M., Almeida-Val V., Wood C.M., Val. A. Physiological impacts and bioaccumulation of dietary Cu and Cd in a model tropical teleost, the Tambaqui (*Colossoma macropomum*).
  POSTER RP084. Thurs. 13th Nov. Exhibit Hall.

- Lu C., Vukov O., Smith D.S., Dixon G., McGeer J. The effects of water chemistry and organism source on the toxicity of dysprosium to *Hyalella Azteca*.
  POSTER RP251. Thurs. 13th Nov. Exhibit Hall.

- McCallum E.S., Bainbridge M., Balshine S.* Behavioural effects of acute exposure to fluoxetine and wastewater effluent in the invasive round goby.
  POSTER RP294. Thurs. 13th Nov. Exhibit Hall.

New Funding:

- **Smith** has been awarded an NSERC CRD grant for his collaborative research with wca environment Ltd. and Unilever studying silver binding to organic matter with an emphasis on reduced sulphur.

The following peer reviewed papers and book chapters were published by the Metals Bioavailability Group (June 2014 – Nov. 2014):

- Blewett, T.A., Chow, T.L., MacLatchy, D.L., Wood, C.M. (2014). A species comparison of 17-α-ethynylestradiol uptake and tissue-specific distribution in six teleost fish. Comp. Biochem. Physiol. [C]. 161:33-40.

- Blewett, T.A., Wood C.M. Salinity-dependent Ni accumulation and oxidative stress responses in the euryhaline killifish (*Fundulus heteroclitus*). Arch. Environ. Contam. Toxicol. In revision.

- Glover, C.N., Blewett, T.A., Wood, C.M. A novel rate of toxicant exposure in an ancient extant vertebrate: Nickel uptake by hagfish skin and the modifying effect of slime. Environ. Sci. Technol. Submitted.

- Leonard, E.M., Banerjee, U., D'Silva, J.J., Wood, C.M. (2014). Chronic nickel bioaccumulation and sub-cellular fractionation in two freshwater teleosts, the round goby and the rainbow trout, exposed simultaneously to waterborne and dietborne nickel. Aquatic Toxicol. 154:141-153.

- Leonard, E.M., Marentette, J.R., Balshine, S., Wood, C.M. (2014). Critical body residues, Michaelis-Menten analysis of bioaccumulation, lethality and behaviour as endpoints of waterborne Ni toxicity in two teleosts. Ecotoxicol. 23:147-162.

- Lim, M. Zimmer, A., Wood, C.M. Exposure to waterborne copper inhibits both the excretion and uptake of ammonia in freshwater rainbow trout (*Oncorhynchus mykiss*). Comp. Biochem. Physiol. [C]. Submitted.

- Loro, V.L., Nogueira L., Nadella S.R., Wood, C.M. (2014). Zinc bioaccumulation and ionoregulatory impacts in *Fundulus heteroclitus* exposed to sublethal waterborne zinc at different salinities. Comp. Biochem. Physiol. [C]. 166:96-104.

- Machado A.A.D.S., Wood, C.M., Bianchini, A., Gillis, P.L. (2014). Responses of biomarkers in wild freshwater mussels chronically exposed to complex contaminant mixtures. Ecotoxicol. 23(7):1345-1358.

- Ransberry, V.E., Blewett, T.A., Wood, C.M., McClelland, G.B. (2014). Oxidative stress and metabolic responses to copper in freshwater- and seawater-acclimated killifish, *Fundulus heteroclitus*. Aquatic Toxicol. In Revision.

- Tellis, M.S., Lauer, M.M., Nadella, S., Bianchini, A. and Wood, C.M. (2014). The effect of Cu and Ni on the embryonic stages of *Strongylocentrotus purpuratus*. Arch. Environ. Contam. Toxicol. 67:453-464.

The following platforms and posters were presented by the Metals Bioavailability Group (June 2014 – Nov. 2014):

- Lu C., Vukov O., Smith D.S., Dixon G., McGeer J. (2014). The effects of water chemistry and organism source on the toxicity of dysprosium to *Hyalella azteca*. ATW, Ottawa, Canada.

- Merrington G., Peters A., Smith D.S, Lofts S., van Egmond R., Nasir R., Alshammari M. (2014). Understanding the chemical speciation of silver from the use of personal care products in aquatic freshwater systems. SETAC Asia/Pacific, Adelaide, Australia.

- Peters A., Merrington G., Simpson A., Smith S., Lofts S., van Egmond R. (2014). Understanding the chemical speciation of silver in aquatic freshwater systems. SETAC Europe, Basel, Switzerland.

- Settimio L., McLaughlin M., Kirby J., Langdon K., Smith D.S. (2014). A multidisciplinary approach to determining complexed Ag in soil water extracts. SETAC Asia/Pacific, Adelaide, Australia.

- Vukov O, Lu C, Smith S, Dixon G, McGeer J. (2014). The effect of cationic composition on dysprosium toxicity to sensitive invertebrates. World Water Day University of Waterloo, Waterloo, Canada

Editor's Desk: This newsletter is distributed by the Metals Bioavailability Group, Wilfrid Laurier University and McMaster University. If you know of others who would enjoy this newsletter, or if you no longer wish to receive it yourself, please contact:

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A wind up amoeba: .-8

And one with a boomerang: .>

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