

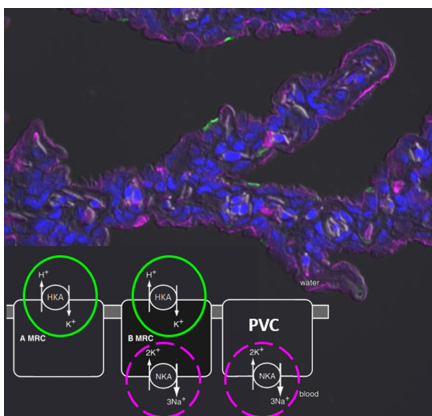
## The H<sup>+</sup>/K<sup>+</sup> ATPases in fish ionregulation: A tale of two sisters.

Jonathan Wilson

*Wilfrid Laurier University, Waterloo, Canada*



Vertebrates have two H<sup>+</sup>/K<sup>+</sup>-ATPases (HKA) with roles in acid-base and potassium regulation. It is well known that stomach acid secretion is accomplished by the gastric HKA, which is comprised of HKα1 (gene: *atp4a*) and HKβ (gene: *atp4b*) subunits. However, the role of the gastric HKA in extra-gastric organs such as the gill and kidney is less clear especially in teleost fishes. The gastric HKA in the gill and kidney in a teleost fish, *Oreochromis niloticus* was studied by focusing on the gastric HKα1 (*atp4a*). We have demonstrated uptake of the K<sup>+</sup> surrogate flux marker rubidium (Rb<sup>+</sup>) *in vivo* in *O. niloticus*; however, we were unable to inhibit this uptake with omeprazole, a potent inhibitor of the gastric HKA. This contrast with a gill *ex vivo* preparation where tissue Rb<sup>+</sup> uptake was significant inhibited by omeprazole. Non-teleost fishes may also express the non-gastric HKA [HKα2 (gene: *atp12a*)]. In the lungfish (*Protopterus annectens*) and lamprey (*Petromyzon marinus*) *in vivo* Rb<sup>+</sup> uptake rates were also measured indicating a carrier mediated mechanism. Using immunohistochemistry we were able to demonstrate an apical localization of both HKα1 and HKβ subunits in tilapia gill and apical localization of HKα2 in lungfish and lamprey gills. The significance of these results will be discussed.



Friday October 27th 2017 at 10.00  
Seminar room at zoophysiology