

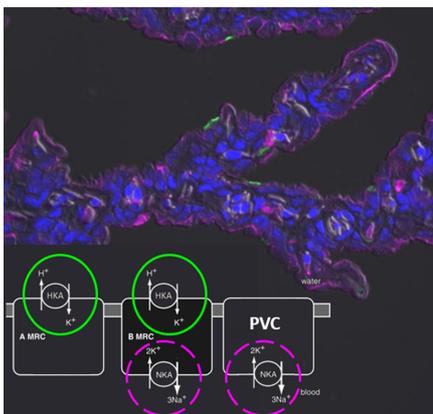
The H⁺/K⁺ ATPases in fish ionregulation: A tale of two sisters.

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Vertebrates have two H⁺/K⁺-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 HK α 1 (gene: *atp4a*) and HK β (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 HK α 1 (*atp4a*). We have demonstrated uptake of the K⁺ surrogate flux marker rubidium (Rb⁺) *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⁺ uptake was significantly inhibited by omeprazole. Non-teleost fishes may also express the non-gastric HKA [HK α 2 (gene: *atp12a*)]. In the lungfish (*Protopterus annectens*) and lamprey (*Petromyzon marinus*) *in vivo* Rb⁺ uptake rates were also measured indicating a carrier mediated mechanism. Using immunohistochemistry we were able to demonstrate an apical localization of both HK α 1 and HK β subunits in tilapia gill and apical localization of HK α 2 in lungfish and lamprey gills. The significance of these results will be discussed.



Friday October 27th 2017 at 10.00
Seminar room at zoophysiology