

## **PARTIONING OF NUTRIENT UPTAKE AND GAS EXCHANGE IN THE GUT OF *Misgurnus anguillicaudatus*.**

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*Misgurnus anguillicaudatus* is a facultative air breathing teleost fish that makes use of its hind gut as an air breathing organ (ABO). The intestine is well vascularized with intraepithelial capillaries making it well suited for gas exchange but what are the consequences for nutrient uptake, the traditional function of the intestine? The alimentary canal was examined histologically to assess differences between three regions of the gut. The three regions of the gut: fore-, mid- and hind-gut have been functionally considered as the digestive, spiral and respiratory zones, respectively. The intestinal Na<sup>+</sup>:glucose cotransporter (SGLT1) and H<sup>+</sup>:peptide cotransporter (PepT1) play important roles in the absorption of carbohydrate and di,tri peptides in the gut of fishes and other animals and were used as markers for nutrient uptake function. In the present study, we partially sequenced SGLT1 and PepT1 cDNAs by RT-PCR and determined their tissue distributions and if diet composition or fasting affect their expression at the mRNA level. SGLT1 mRNA was found in kidney, liver and in the three zones of the gut except the most distal part. PepT1 mRNA was found in heart, liver, and fore and mid-gut. PepT1 mRNA was not detected in the hindgut (intestine). It was not possible to modulate the expression of SGLT1 and PepT1 with diet. Our results clearly show the presence of SGLT1 transcript in the respiratory zone of the intestine indicating an overlap in function. In the case of PepT1, this overlap was limited to the mid-gut. Supported by FCT grant POCTI/BSE/47585/2002.