

Acid-sensitive ion channel 2 (ASIC2) in the zebrafish enteric nervous system

Rosalia Zichichi, Antonino Germanà, Elena De Felice, Emilia Ciriaco

Dipartimento di Morfologia, Biochimica, Fisiologia e Produzione Animale, Sezione di Morfologia, Università di Messina, Italia

Acid-sensitive ion channels (ASICs) are members of the voltage-insensitive, amiloride-sensitive epithelial Na⁺ channel/degenerin family of cation channels. Recently four genes coding for ASICs in the human and mouse genome (*asic1-asic4*) have been identified. ASICs showed a broad expression pattern in the central and peripheral nervous system and were mainly localized in sensory neurons of the dorsal root and trigeminal ganglia. Recent data from ASICs knock-out mice suggested a key role of these proteins in the visceral mechanotransduction, although the real role of ASIC2 in the gastrointestinal tract remains still unclear. Therefore, this study was undertaken to analyze the expression and the localization of ASIC2 in the zebrafish intestinal tract. The results demonstrated the expression of mRNA for ASIC2 and the occurrence of a specific protein band of 65kDA corresponding to the mammalian ASIC2 in the intestinal tract of zebrafish. A positive immunoreaction for ASIC2 was found in the neuronal somata of the submucous and myenteric plexuses along the enteric nervous system. The ASIC2 protein was also observed in different cellular types localized in the entire intestine. These cells, for their morphology and topographical localization, could be identified as neuroendocrine cells. Our results, taken together, demonstrated the presence of ASIC2 in the zebrafish gastrointestinal tract supporting the hypothesis that this protein could be deeply involved in the visceral mechanosensation, faecal output and endocrine regulation.

Key words

Zebrafish, ASIC2, enteric nervous system