The role of S100B in the developing enteric nervous system

E. Capoccia[1] , M. Hao[2], W. Boesmans[2], G. Esposito[1],P. Vanden Berghe[2]

[1]Dept. Physiology and Pharmacology 'V. Erspamer', Sapienza University Rome, Italy
[2]Laboratory for Enteric Neuroscience (LENS), TARGID, University of Leuven,Leuven, Belgium

S100B is a Ca2+ binding protein, which is predominantly produced by glial cells (Heizmann, 2002). Previous studies have shown that S100B is first expressed at embryonic day (E)14.5 by post-mitotic enteric glial cells (Joseph et al., 2011). However, currently little is known about its possible function and whether the specific onset of expression is important for the developing the enteric nervous system (ENS). We cultured intact E13.5 gut in the presence of arundic acid (300 μM), an inhibitor of S100B protein synthesis (Asano et al., 2005), for 2 days in vitro. We then analysed changes in the numbers of enteric neurons, glia and ENS progenitors by performing immunohistochemistry against HuC/D, S100B and Sox10. In control cultures, S100B expression was identified in the rostral small intestine. This expression was successfully inhibited by arundic acid. Exposure to arundic acid did not affect the number of HuC/D+ neurons but significantly reduced the number of Sox10+ cells. The remaining Sox10+ cells also showed weaker immunoreactivity. Surprisingly, a subpopulation of HuC/D+ cells also exhibited Sox10-immunoreactivity in their nucleus. This was observed only in arundic acid cultures, but not in control conditions. Our data suggest that the timely appearance of S100B is important for the development of the ENS. Inhibition of the onset of S100B expression could redirect fate specification of neurons and glia. We are currently investigating the identity of the HuC/D and Sox10 co-expressing cells that appear as a result of inhibition of S100B expression.

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