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Evaluation of galanin receptor antibodies in normal and pathologic tissues

Bernhard Brodowicz[1], Kerstin Graf[1], Rodolfo Bianchini[1], Linda Lundström[2], Barbara Kofler[1].
[1]Laura Bassi Centre of Expertise THERAPEP, Research Program for Receptorbiochemistry and Tumormetabolism, Department of Pediatrics, Paracelsus Medical University, Salzburg, Austria, [2]Neuroscience Research, Discovery Chemistry, F. Hoffmann-La Roche Ltd, Basel, Switzerland

Neuropeptide galanin is involved in the regulation of several physiological processes, which are mediated via three different G-protein-coupled receptors (GPCRs; GalR1, GalR2, GalR3). The galanin receptors show distinct but overlapping expression in the central nervous system and in the periphery. GPCRs have been described as major drug targets for various human diseases, such as neuronal disorders, inflammatory processes and cancer. Therefore, the determination of the cellular and subcellular localization of galanin receptors is of high interest.

Antibodies are a valuable tool to study the distribution of receptors of interest. Even though there are several antibodies raised against the different galanin receptor subtypes commercially available, it has been demonstrated that lack of selectivity appears to be the rule rather than the exception for antibodies against these GPCRs (Naunyn Schmiedebergs Arch Pharmacol. 2009;379:417-20).

Therefore, the specificity of several commercially available antibodies to human galanin receptor subtypes was evaluated in immunoblotting and immunohistochemistry, using cell lines stably transfected with a given human galanin receptor subtype (SY5Y-hGalR1, SY5Y-hGalR2 and HEK-hGalR3).

One out of two anti-GalR1 antibodies, one out of two anti-GalR2 antibodies and one out of three tested anti-GalR3 antibodies showed specific staining in Western blot analysis and immunohistochemistry. With these antibodies, specific galanin receptor subtypes were identified in selected normal and pathologic tissue. The results of these tests indicate that the anti-GalR1 and anti-GalR3 antibodies were specific and sensitive to their target receptor subtype. Whereas, for the anti-GalR2 antibody unspecific staining could not be excluded.

According to the literature which describes GalR1 as the “neuronal” galanin receptor subtype, GalR1-like immunoreactivity (-LI) was found on neurons of the spinal cord and ganglia. In addition, major GalR1-LI was detected on immune cells in all peripheral tissues. GalR2-LI showed diffuse staining of epithelia, including the skin, the GI-tract and the respiratory system. In the periphery GalR3-LI was found on ductal cells of sweat glands, the pancreas, liver, testis, lung and mammary gland. Furthermore, GalR3-LI was observed around blood vessels in all peripheral tissues, on all three different muscle types and on epithelia of the GI- and respiratory tract.

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