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Poster presentation

Gene inactivation of the β1 subunit of NO-sensitive guanylyl cyclase in mice

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NO-sensitive guanylyl cyclases are the most important receptors for the signalling molecule NO. Activation of guanylyl cyclase by NO leads to the formation of the intracellular messenger cGMP. The enzyme is a heterodimer which consists of two subunits, α and β. Three different subunits exist in vivo: Two α subunits (α_1 and α_2) and one β subunit (β_1). Functional enzymes are formed by heterodimerization. The two known guanylyl cyclase isoforms are composed of one of either α subunit and the β_1 subunit (i.e. $\alpha_1\beta_1$ and $\alpha_2\beta_1$).

Although the function of NO-sensitive guanylyl cyclase has been extensively studied during the last 30 years (e.g. its role in smooth muscle relaxation, platelet inhibition, leukocyte adhesion or neurotransmission) many functions of the enzyme and its product cGMP await further clarification.

In order to elucidate the role of NO-sensitive guanylyl cyclase in vivo we generated mice in which the β_1 subunit of the enzyme was knocked out. Based on the fact that the β_1 subunit is the dimerizing partner for both α subunits, we expect these mice not to show any cGMP formation upon NO stimulation. Investigation of these mice will provide further information on the importance of NO-sensitive guanylyl cyclase.