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Meeting abstract

Establishing a new mouse model for investigating the function of amygdala neurons in anxiety

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Benzodiazepine site agonists modulate the firing pattern of neurons via $GABA_A$ receptors and by that influence the activity of the network in which they participate and cause appropriate changes in behaviour. Since the amygdala is involved in regulating anxiety, it can be expected that $GABA_A$ receptors located in this brain region contribute to the anxiolytic effects of benzodiazepine site agonists. Here we take advantage of an *in vivo* mouse model [1] in which a Phe to Ile point mutation was introduced into the gene coding for the $GABA_A$ receptor γ2 subunit. This γ2F77I mutation, which was also flanked by loxP sites, affects only the benzodiazepine binding site of the respective receptors, and mice carrying this mutation no longer are sensitive to certain benzodiazepine site agonists but are otherwise normal. Here we aim to selectively replace the "benzodiazepine insensitive" mutated γ2F77I subunit by a GFP-labeled native one in the amygdala of γ2F77Ilox mice by a stereotaxic injection of recombinant adeno-associated viral (rAAV) vectors expressing Cre-recombinase and GFP-labeled wild-type γ2 subunits. It has been demonstrated previously that the replaced wild-type subunits combine with endogenous subunits to form completely assembled receptors with normal subcellular distribution. Then only those amygdala neurons expressing the GFP-labeled wild-type γ2 subunits can be modulated by a systemic application of these benzodiazepine site agonists and any behavioural effects observed with these drugs must have been generated via these neurons. In this report we present a preliminary characterization of the newly developed mouse model demonstrating the correct expression of Cre-recombinase and GFP-labeled wild-type γ2 subunits in amygdala neurons by immunohistochemical and in situ hybridization techniques. Future experiments aim to characterize our model by behavioural pharmacology in paradigms of anxiety.

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