

7. Summary

Alexey Kolbasenko

Strain and stock differences between related laboratory rats from Russia and Germany

Anxieties with a prevalence of up to 20% are some of the most frequent psychiatric diseases. The neuro-biological bases of anxieties so far have not been explored sufficiently. Animal experimental investigations on anxieties are complicated by differences in strains or sub-lines of experimental rats. As a consequence, conflicting results are reported in publications on investigations of the anxiety behaviour of rats although identical and standard behavioural tests are used.

The formation of sub-lines in strains of rats that were kept in isolation for 16 years at the Academy of Science in Novosibirsk, Russia, cannot be excluded. It was of interest to compare the anxiety and exploration behaviour of these Russian Wistar- and Sprague Dawley (SD)-rats with that of German rats, historically related to the Russian strains, in regards to their strain and line differences.

In the cause of behavioural tests (Elevated-plus-maze-, Open-field-, Hole-Board-, Free-exploratory-paradigm- and subsequent Rota-Rod-Test), Russian SD-rats in all tests were less 'anxious' and generally more active than German SD-rats. Differences between Russian and German Wistar rats in regards to anxiety behaviour were small. The Russian Wistar rats though motorically were more active.

Following the behavioural tests, the serotonin contents in the pre-frontal cortex, the hippocampus and the raphe region were determined. Serotonin contents of Russian Wistar-rats in all regions were lower than of the German Wistar-rats, although both lines did not differ in their anxiety behaviour. The less anxious Russian Sprague Dawley-rats had lower serotonin contents than the German Sprague Dawley-rats.

The results in total indicate that long-lasting breeding in isolation may have lead to changes in behaviour and in concentrations of transmitters in the central nervous system in the Russian rats. The formation of sub-lines in both Russian lines is suggested.

For further investigations it is recommended to consider strain- or line differences of rats. When reporting investigation results, the origin of the animals should be recorded in detail.