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### **Safety testing: Interval scale to test development of rats**

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To protect children against adverse exposure to drugs and chemicals in the environment safety rules are documented in test guidelines for experimental testing of potential toxic effects on neurodevelopment. Neurophysical, sensory, motor and cognitive endpoints for rats of different age are included in these test guidelines. Such regulatory animal studies with extensive behavioural testing are logistically complex, labour intensive, time consuming and involve hundreds of animals. Unfortunately, clear guidance on adequate and rational integration of the test results is lacking, mainly because the test scores lack a common metric that allows comparison of developmental scores across age.

We are developing a quantitative score (so called D-score) with improved measurement characteristics to estimate normal development in rats, with the intention to ultimately use the D-score and interval scale in (regulatory) developmental and juvenile neurotoxicity testing. The basic assumption of the D-score is the existence of a common continuous scale for development. The strength of the proposed model is that the definition of the D-scores is not specific to age, so the D-score of a measured individual can be compared to the D-score of another individual of different age. Difference scores between sessions can be used to evaluate development on the individual level.

This implies that, once such an interval scale for rats is available, the number of tests can be limited by selecting those tests that are most informative to detect delayed/disturbed development. For regulatory testing this allows a reduction of labour-intensive testing and reduction and refinement of animal use.