

Dr. Maria Gulinello
Behavioral Core Facility
Albert Einstein College of Medicine

Albert Einstein College of Medicine
Dominick P. Purpura Department of Neuroscience
1410 Pelham Pkwy S K912F Bronx, NY 10461
718 - 430 4042
mgulin@aecom.yu.edu

Behavioral Core Protocols and Training

Grip Strength

The animal's forepaws are placed on a wire or rope and the latency to fall is recorded (sec). The mean of 2-3 trials or the best score of 2-3 trials are the most common measures analyzed in this assay [1].

Aging [2, 3], sex, and strain [1, 4] are likely to affect the outcome of this assay.

[1-21]



References

- 1. Maurissen, J.P.J., et al., *Factors affecting grip strength testing*. Neurotoxicology and Teratology, 2003. 25(5): p. 543.
- 2. Ingram, D.K., et al., *Differential effects of age on motor performance in two mouse strains.* Neurobiology of Aging, 1981. 2(3): p. 221.
- 3. Lalonde, R., C.C. Joyal, and M.I. Botez, *Effects of folic acid and folinic acid on cognitive and motor behaviors in 20-month-old rats.* Pharmacology Biochemistry and Behavior, 1993. 44(3): p. 703.
- 4. Rogers, D.C., et al., *Use of SHIRPA and discriminant analysis to characterise marked differences in the behavioural phenotype of six inbred mouse strains.* Behav Brain Res, 1999. 105(2): p. 207-17.
- 5. Abdel-Rahman, A., et al., *Neurological deficits induced by malathion, DEET, and permethrin, alone or in combination in adult rats.* J Toxicol Environ Health A, 2004. 67(4): p. 331-56.
- 6. Albee, R.R., et al., *Neurobehavioral effects of dietary restriction in rats*. Neurotoxicology and Teratology, 1987. 9(3): p. 203.
- 7. Anderson, K.D., M. Abdul, and O. Steward, *Quantitative assessment of deficits and recovery of forelimb motor function after cervical spinal cord injury in mice*. Experimental Neurology, 2004. 190(1): p. 184.
- 8. Anderson, K.D., A. Gunawan, and O. Steward, *Quantitative assessment of forelimb motor function after cervical spinal cord injury in rats: Relationship to the corticospinal tract.* Experimental Neurology, 2005. 194(1): p. 161.
- 9. Boecker, H., et al., Force level independent representations of predictive grip force-load force coupling: a PET activation study. Neuroimage, 2005. 25(1): p. 243-52.
- 10. Bona, E., B.B. Johansson, and H. Hagberg, *Sensorimotor function and neuropathology five to six weeks after hypoxia-ischemia in seven-day-old rats.* Pediatr Res, 1997. 42(5): p. 678-83.
- 11. Bowen, S.E., et al., Functional observational battery comparing effects of ethanol, 1,1,1-trichloroethane, ether, and flurothyl. Neurotoxicology and Teratology, 1996. 18(5): p. 577.
- 12. Cabe, P.A., et al., *A simple recording grip strength device.* Pharmacology Biochemistry and Behavior, 1978. 8(1): p. 101.
- 13. Dodd, C.A., D.L. Ward, and B.G. Klein, *Basal Ganglia accumulation and motor assessment following manganese chloride exposure in the C57BL/6 mouse.* Int J Toxicol, 2005. 24(6): p. 389-97.
- 14. Dunnett, S.B., E.M. Torres, and L.E. Annett, *A lateralised grip strength test to evaluate unilateral nigrostriatal lesions in rats.* Neurosci Lett, 1998. 246(1): p. 1-4.
- 15. Elsner, J., C. Fellmann, and G. Zbinden, *Response force titration for the assessment of the neuromuscular toxicity of 2,5-hexanedione in rats.* Neurotoxicology and Teratology, 1988. 10(1): p. 3.
- 16. Fowler, S.C., et al., Low grip strength, impaired tongue force and hyperactivity induced by overexpression of neurotrophin-3 in mouse skeletal muscle. International Journal of Developmental Neuroscience, 2002. 20(3-5): p. 303.
- 17. Ivens, I., *Neurotoxicity testing during long-term studies.* Neurotoxicology and Teratology, 1990. 12(6): p. 637.
- 18. Perrine, J.W. and E.I. Takesue, *Use of the rotarod in determining grip strength in rats with adjuvant-induced arthritis.* Arch Int Pharmacodyn Ther, 1968. 174(1): p. 192-8.
- 19. Spencer, P.J., et al., *Neurotoxicity screening methods are sensitive to experimental history.* International Journal of Psychophysiology, 1993. 14(1): p. 5.
- 20. van Riezen, H. and L. Boersma, *A new method for quantitative grip strength evaluation*. European Journal of Pharmacology, 1969. 6(3): p. 353.
- 21. Zeman, R.J., H. Peng, and J.D. Etlinger, *Clenbuterol retards loss of motor function in motor neuron degeneration mice.* Experimental Neurology, 2004. 187(2): p. 460.