Newsletter

Berlin-Brandenburg research platform BB3R – Issue 10/11 Oct 2019

BB3R introduces: AG Baumgart

Our research focus is on the 3Rs, especially improving the well-being of laboratory rodents is a central aspect of our work.

Fig 1: Rewarding a mouse with white chocolate

Training of laboratory animals can be a helpful tool to reduce stress and is actually demanded by the EU directive 2010/63/EU. We use clicker training, which is a form of positive reinforcement training using a conditioned secondary reinforce (click) to build up a time bridge between the desired behavior and the upcoming reward (white chocolate). Detailed protcols of our training can be found in our JoVE publications[1,2]. Our latest research results obtained in close collaboration with the Institute of Animal Welfare, Animal Behavior and Laboratroy Animal Science (Head: Prof. Dr. Christa Thöne-Reineke) indicate that clicker training helps to reduce depressive and anxiety related behaviors during experimental procedures and therefore helps to improve the quality of life of laboratory mice and rats in addition to animal friendly handling procedures. The use of clicker training builts a relationship of trust between animals and thereby reducing stress for the animals and the people working with the animals.

Fig 2: Uterus model

Our group also addresses further welfare issues of laboratory animals like pup mortality, which can be significantly reduced by appropriate enrichment. Further our group aims to reduce or even totally replace animals for training of surgical procedures by creating realistic 3D models, cormparable to the models that are already used for the training of surgeons in human medicine. Currently we develop a mouse uterus model for reducing the number of animals used for training of the *in utero* eletroporation, a technique frequently used in neurosciences. The model includes a realistic embryo with a lateral brain ventricle for injection training. By measuring size, compression strength and uterus tensile strength we are able to verify the realistic character of our model.

[1]Introducing Clicker Training as a Cognitive Enrichment for Laboratory Mice. J Vis Exp 2017 Mar 6; (121)
[2]Using Clicker Training and Social Observation to Teach Rats to Voluntarily Change Cages. J Vis Exp 2018 Oct 25; (140)

Prize:

Katharina Hohlbaum received the Dr. Wilma von Düring Research Prize for her doctoral thesis “Severity assessment of repeated anesthesia in mice—an objective investigation of animal-based indicators of well-being” (Beurteilung des Schweregrades von wiederholten Narkosen bei Mäusen durch objektive Ermittlung tierbasierter Indikatoren für Wohlbefinden).

New publications:

Hypoxia and mesenchymal stromal cells as key drivers of initial fracture healing in an equine in vitro fracture hematoma model.
Pfeiffenberger M, Bartsch J, Hoff P, Ponomarev I, Barnewitz D, Thöne-Reineke C, Buttgereit F, Gaber T, Lang A.
PLoS One. 2019 Apr 4;14(4) e0214276. doi: 10.1371/journal.pone.0214276. eCollection 2019.

Qualifying X-ray and Stimulated Raman Spectromicroscopy for Mapping Cutaneous Drug Penetration.
Wanjiku B, Yamamoto K, Klossek A, Schumacher F, Pischon H, Mundhenk L, Rancan F, Judd MM, Ahmed M, Zoschke C, Kleuser B, Rühl E, Schäfer-Korting M.
Anal Chem. 2019 Jun 4;91(11):7208-7214. doi: 10.1021/acs.analchem.9b00519. Epub 2019 May 15.

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