

## Detection of male-mouse incompatibility in research studies using an automated in-home cage monitoring system (the TRACK-system)

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Group-housed male mice exhibit aggressive behaviour towards their cage mates as part of establishing social hierarchy. Compatibility depends on the degree of dominant and submissive behaviour among the male individuals. In some cases, the group remains incompatible, and fighting can escalate, being detrimental both to animal welfare and to data quality. Commonly, research institutions rely on manual supervision, and incompatibility is often noticed post factum, when fighting wounds are visible. Besides being labour-intensive, this method does not provide 24/7 surveillance, resulting in several aggressive altercations going unnoticed. Trackpaw Scientific AB is developing a platform in collaboration with AstraZeneca to detect incompatible activity for group-housed male mice in their home cage. The TRACK platform is placed in the cage bottom and does not rely on cameras or customized rack systems. It tracks weight and movement of microchipped mice to detect ongoing aggressive behaviour as well as to provide data for a more thorough post-processing analysis. Specific behaviours, e.g. escaping movements, can also be detected in real-time. In a pilot study, 21 C57 male mice (8 weeks old) were monitored in groups of 3, over two days, using the TRACK platform. The mouse groups were monitored with manual supervision and camera surveillance used as ground truth. The platform detected all fighting episodes (n=21) with very few false alarms. Sessions that involved chases and altercations also had a higher general activity. This pilot study provides good indications that the platform technology has the means to capture behaviours of incompatibility between group-housed male mice.