

Cincinnati Mouse Metabolic Phenotyping Center

Behavior and Cognitive Core:

Procedures that are commonly requested by core customers

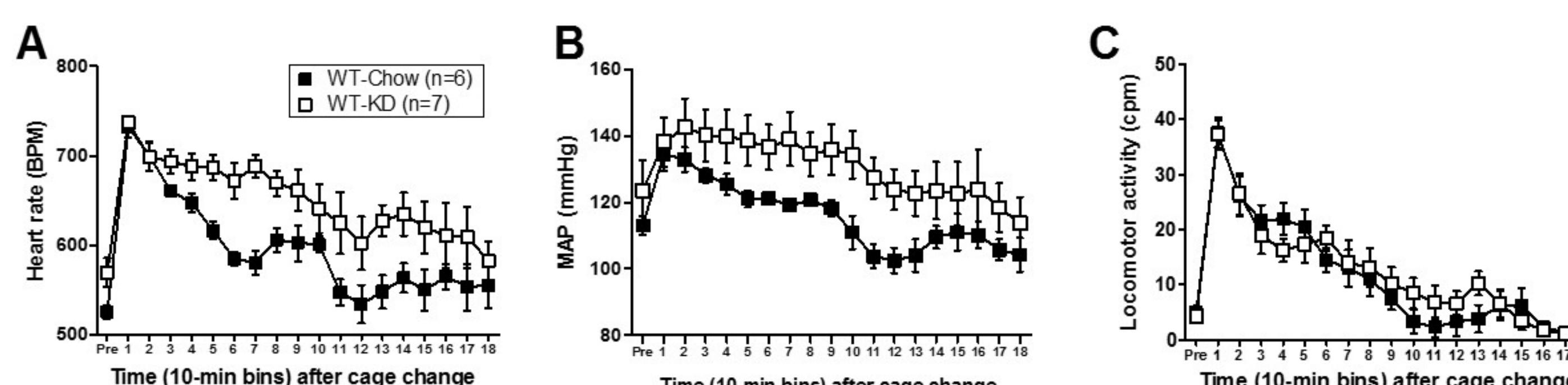
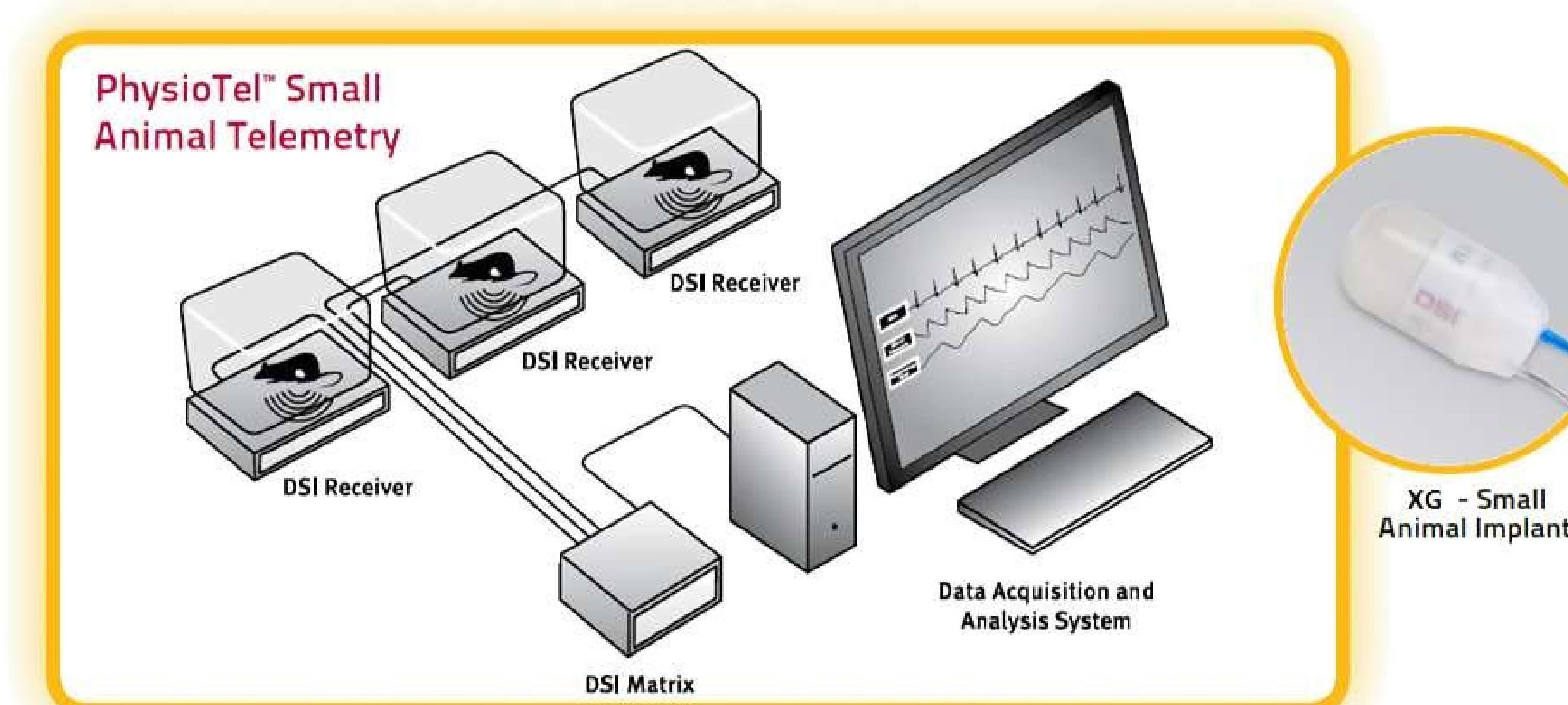
Dana Buesing¹, Teresa Reyes, PhD¹, Steve Woods, PhD², and Yvonne M. Ulrich-Lai, PhD¹
 Departments of ¹Pharmacology and Systems Physiology, and ²Psychiatry and Behavioral Neuroscience,
 College of Medicine, University of Cincinnati

Radiotelemetric recordings

Provides continuous assessment of physiological variables (e.g., heart rate; systolic, diastolic, mean arterial, and pulse pressures; and locomotor activity) in awake, untethered mice in their home cages. This prevents the confounding effects of handling stress and anesthesia on physiological assessments.



For cardiovascular parameters, the tip of the DSI device is implanted into a carotid artery, and the transponder is placed subcutaneously.

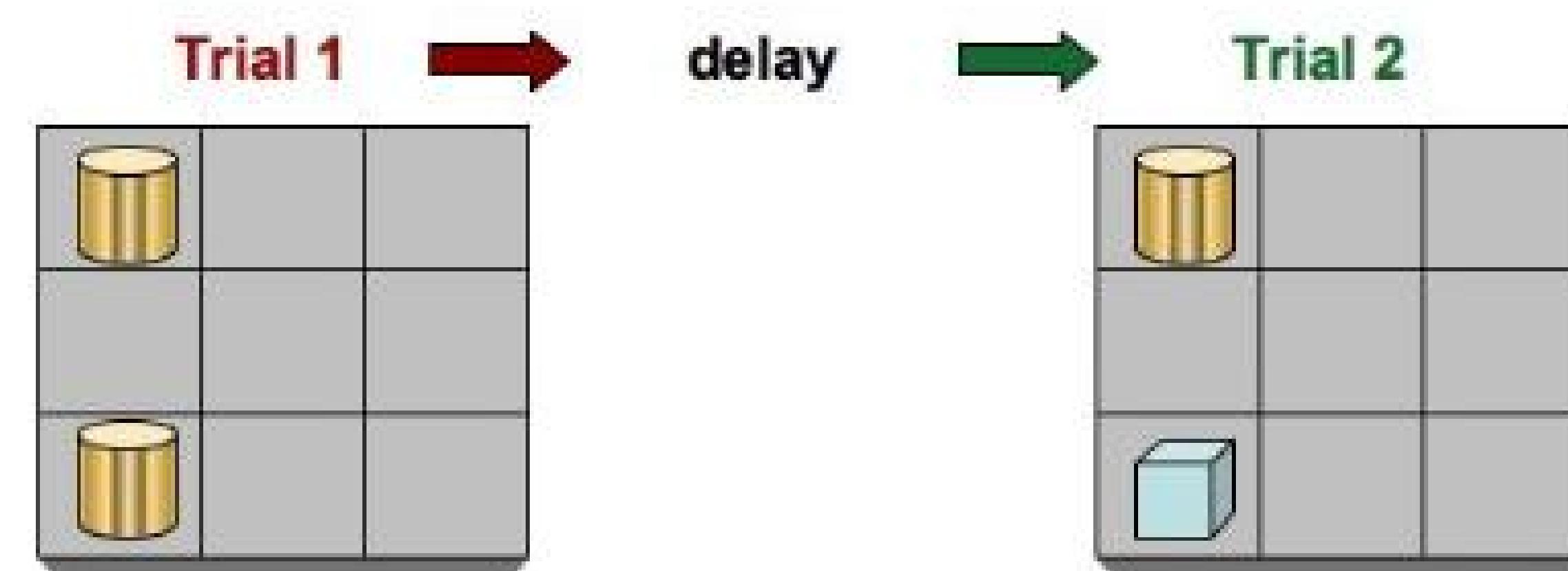


Example of radiotelemetric methods. A mild stressor (placement into a new, clean home cage) given to wild-type C57Bl6 mice maintained on a normal chow diet increases (A) heart rate, (B) mean arterial pressure (MAP), and (C) locomotor activity for approximately 2 h after the stress. The tachycardic and pressor effects of the mild stress are exacerbated in wild-type C57Bl6 mice maintained on a ketogenic diet (KD), while the locomotor response is unaffected by diet type.

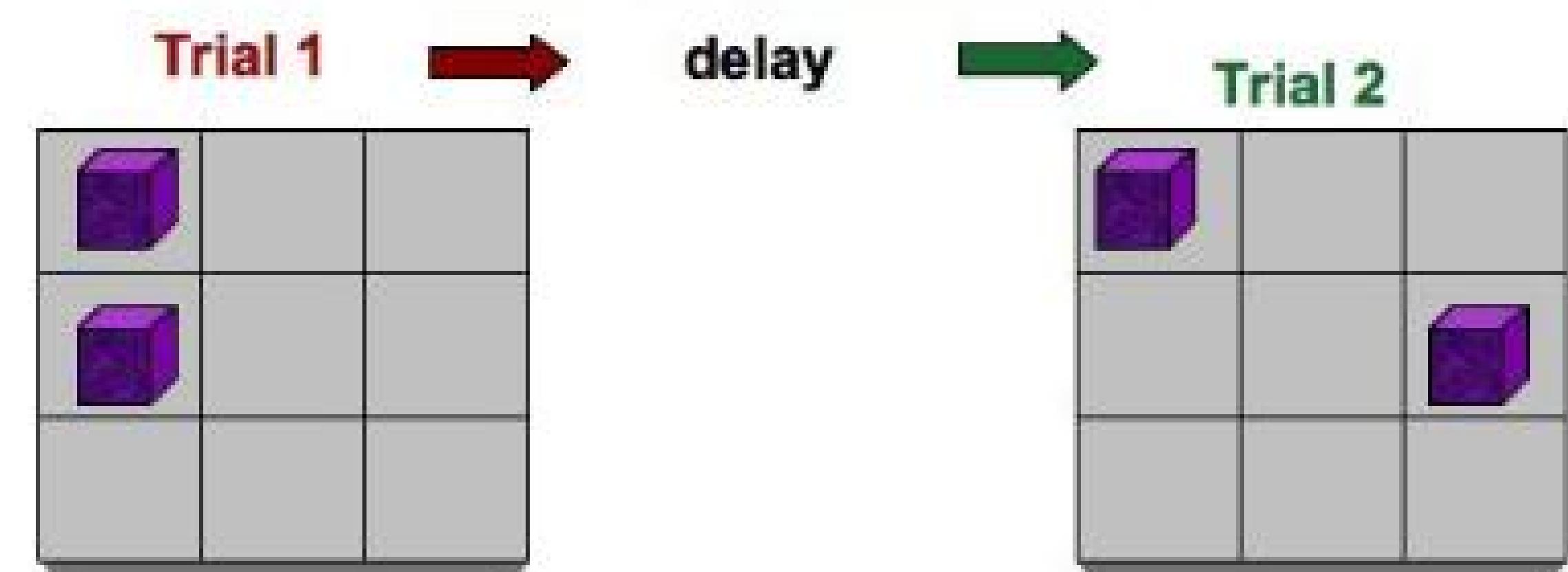
Behavioral tests of cognition and anxiety

Provides high throughput behavioral assays of cognitive (e.g., declarative and spatial memory) and stress-related (e.g., anxiety-like) behaviors in mice.

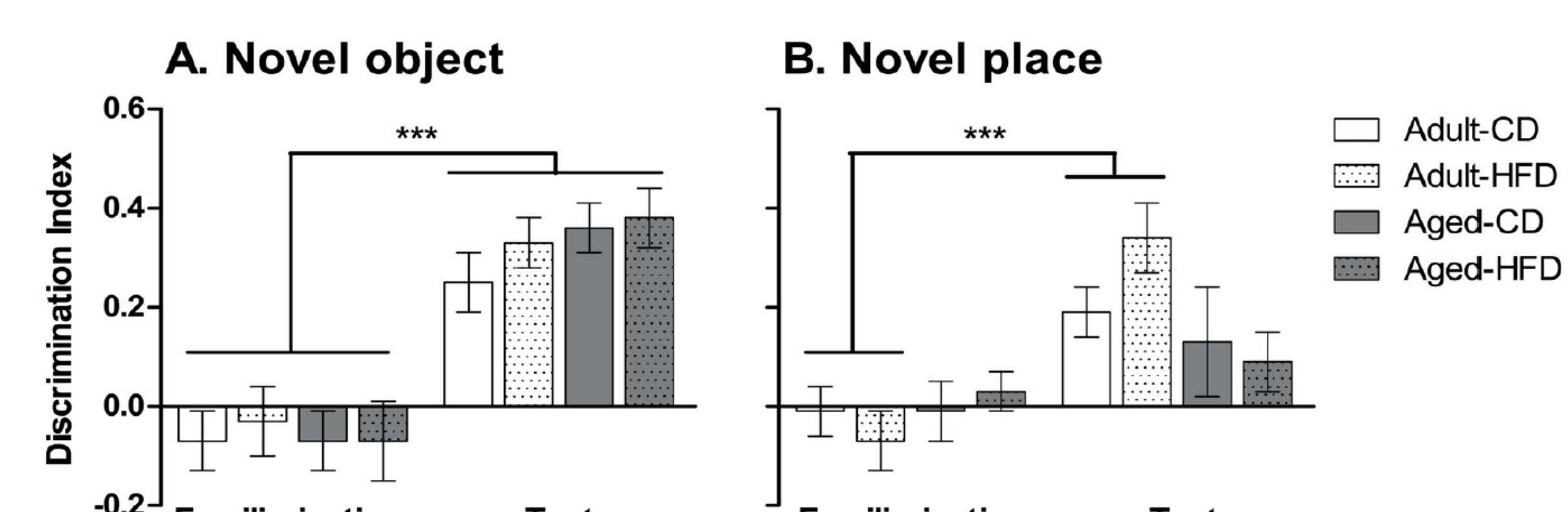
Object Recognition (Visual)



Object Placement (Spatial)



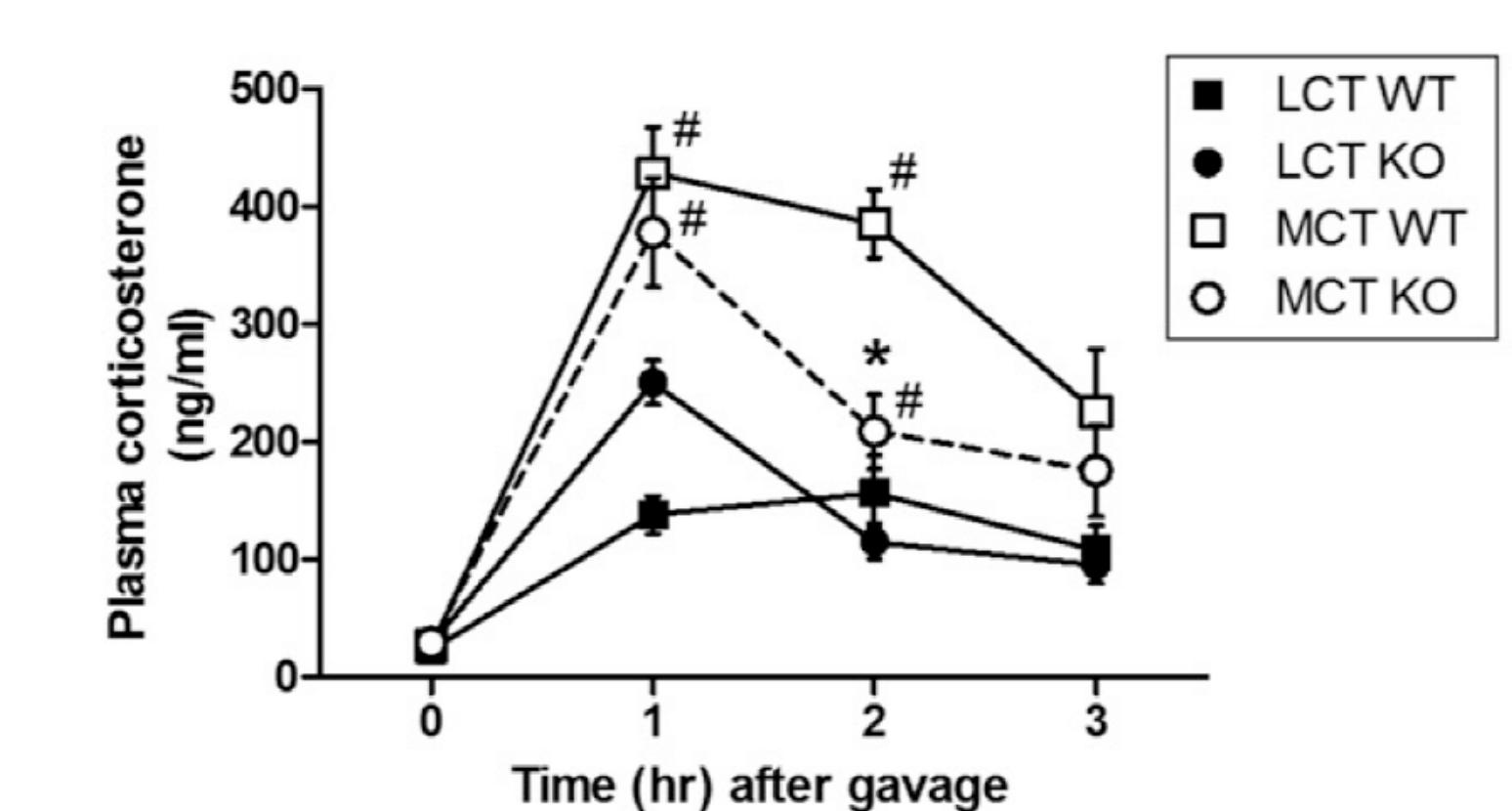
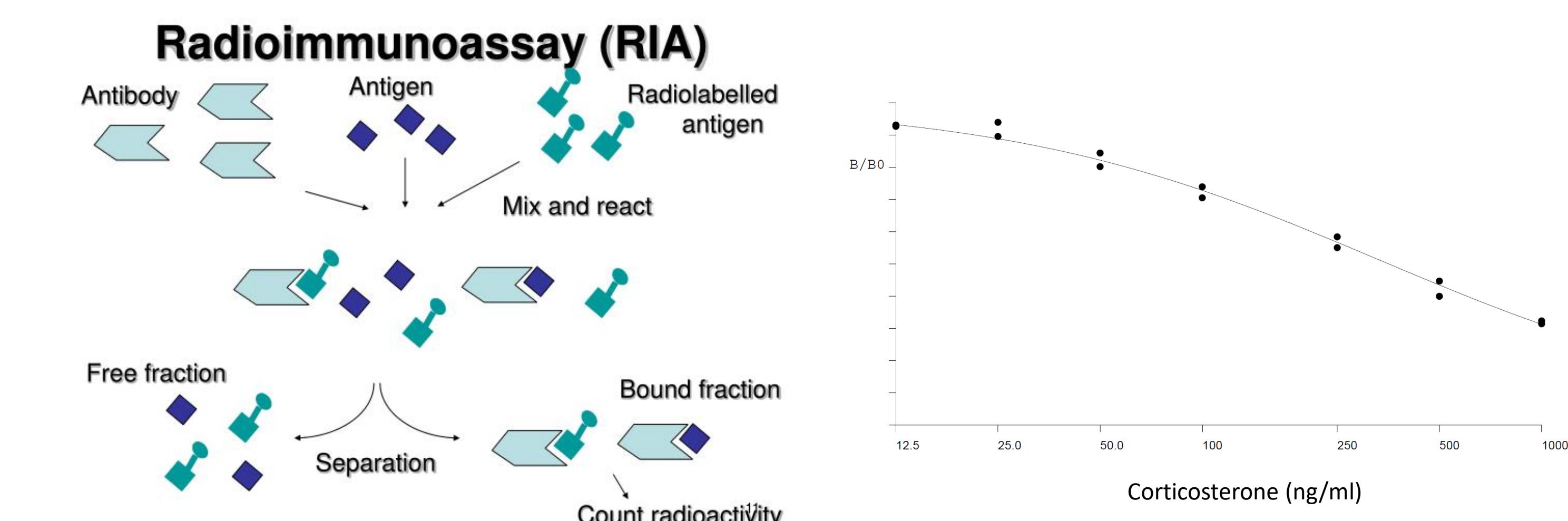
Mice will prefer to investigate the new object/location if they remember that they already saw the old object/location.



Example of novel object recognition and placement tests. Adult and aged mice on control diet (CD) or high-fat diet (HFD) were subjected to the novel object recognition (A) and placement (B) tests, and data are shown as the discrimination index ((novel – familiar)/total). Aging impaired performance in the novel object placement test, while HFD did not affect performance in either test. Data from Kesby JP et al. (2015) PLoS One, 10(10): e0140034.

Radioimmunoassays

Provides highly-sensitive measurements of metabolic hormones in very small volumes of plasma or serum. This allows for repeated, non-terminal assessments of these hormones in mice.



Example of radioimmunoassay methods. Gavage of medium chain triglycerides (MCT; vs. long chain tryglyceride (LCT) controls) increased plasma corticosterone levels in wild-type (WT) C57Bl/6J mice, and this effect was blunted in FGF21-deficient (KO) mice. n=6-12/group. *p<0.05 vs. MCT WT, #p<0.05 vs. respective LCT-treated group. Data from Ryan KK et al. (2018) *Endocrinology*, 259: 400-413.

Acknowledgements

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