

Emotional, cognitive and social phenotyping

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Animal models of neuropsychiatric disorders

- ▶ Modeling components or symptoms of complex behavioral abnormalities
- ▶ Appreciating a value of testing animal behavior
- ▶ Avoiding over-interpretations

Questions

- ▶ How to test?
- ▶ What tests to use?
- ▶ How many tests?
- ▶ Whom to test?
- ▶ How often to test?

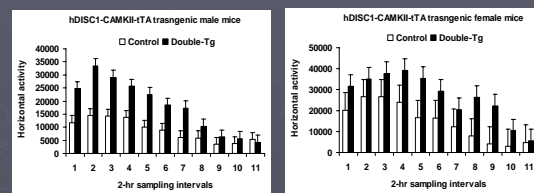
Methodological principles

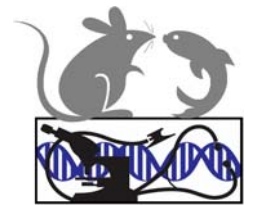
- ▶ Genetic background, strain effect

Methodological principles

- ▶ Sex dependence

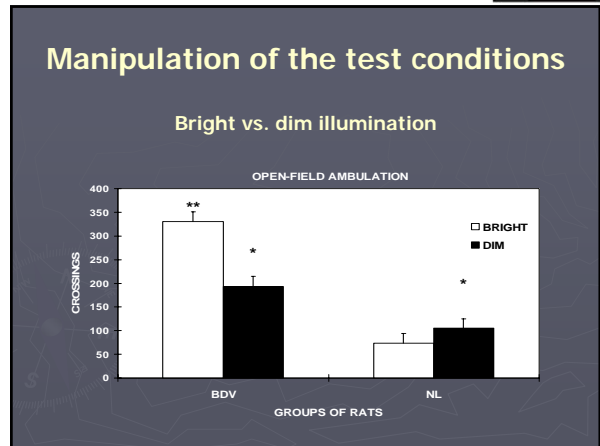
Male but not female mice exhibit hyperactivity





Methodological principles

- ▶ Manipulations of the test conditions

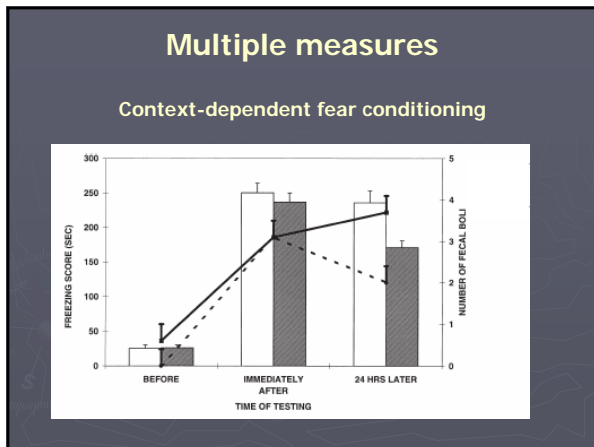


Methodological principles

- ▶ “Challenging” animals to observe effects
 - Pharmacological compounds
 - Stress
 - Infectious agents
 - Environmental enrichment

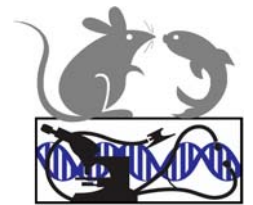
Methodological principles

- ▶ Multiple outcome measures
 - Different measures can show inconsistent results
 - ▶ overt responses vs. autonomic responses

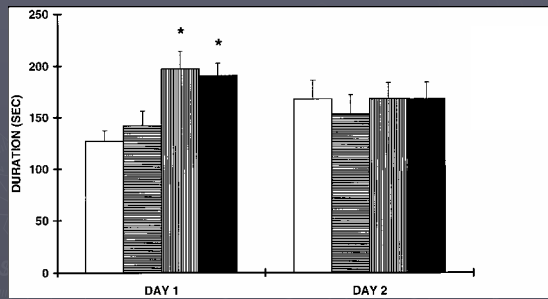


Methodological principles

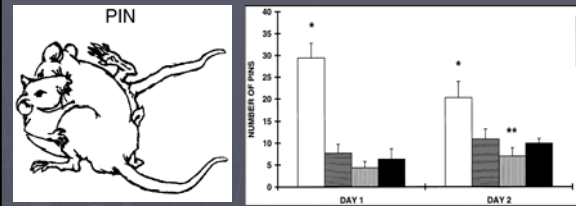
- ▶ Assessments appropriate for age



Social interaction in young animals



Play activity in young animals



Methodological principles

- ▶ Paradigms based on different motivations
 - Hunger vs. thirst
 - Negative vs. positive reinforcements

Methodological principles

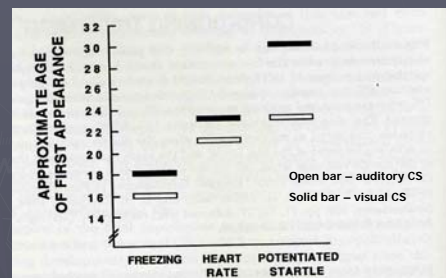
- ▶ Paradigms involving different brain systems
 - Fear of height; predator or pain
 - Learning and memory tests using auditory, visual or olfactory conditioned and unconditioned stimuli
 - Social interaction in familiar and unfamiliar settings
 - ▶ Aggressive vs. non-aggressive social behaviors

Methodological principles

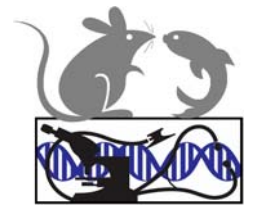
Behavioral analysis of developing animals

- Litter as the unit of analysis
- Standard litter size (four males and four females)
- Comparing homogeneous and heterogeneous litters
 - ▶ mother can attend treated and untreated pups differently
 - ▶ depending on treatment pups respond to the mother differently
- Testing at different times across postnatal development
- Early tests can be more sensitive

Developmental course of fear-related responses



From Hunt and Campbell, 1997



What we have available in the BRB suite now

Emotionality tests

- ▶ Open field test
- ▶ Elevated plus-maze
- ▶ Fear-potentiated startle

- ▶ Predator presentation
- ▶ Social interaction

Cognitive tests

- ▶ Morris Water Maze
- ▶ Context- or cue-dependent fear conditioning

- ▶ Object/subject recognition and discrimination

Social activity tests

- ▶ Play activity
 - ▶ Play wrestling and pinning
 - ▶ Play solicitation activity

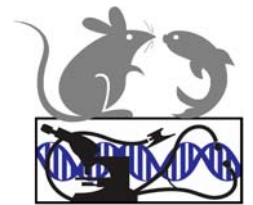
- ▶ Adult social interaction
 - Open field test
 - Intruder-resident test
 - ▶ Non-aggressive social interaction
 - Partner exploration; anogenital investigation; crawl/mounting; approach/follow
 - ▶ Aggressive interaction
 - Tail rattling; attacks; aggressive grooming; wrestling; chasing

Activity chambers



Acoustic startle response





How to find us

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