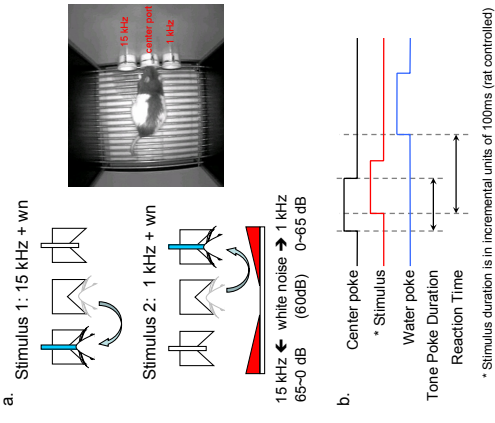
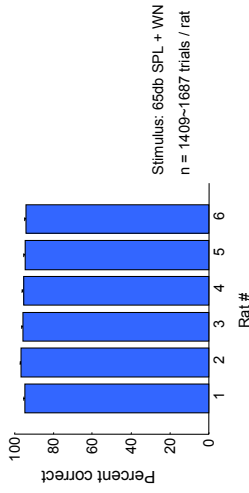


The role of auditory cortex in frequency discrimination behavior of rats

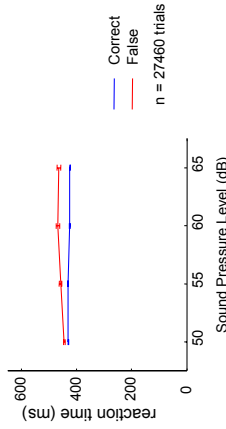
Two alternative forced choice task



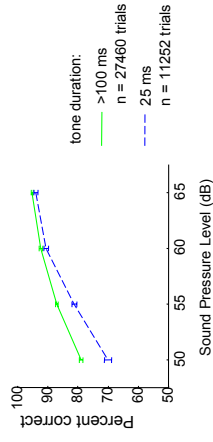
Accurate performance (>90%)



Fast reaction time



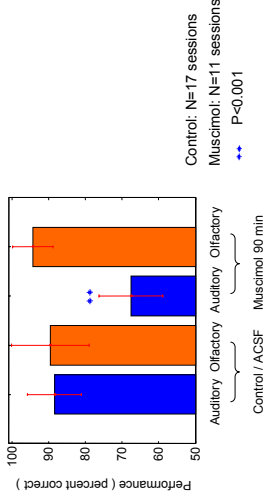
Graded performance



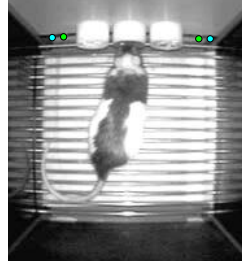
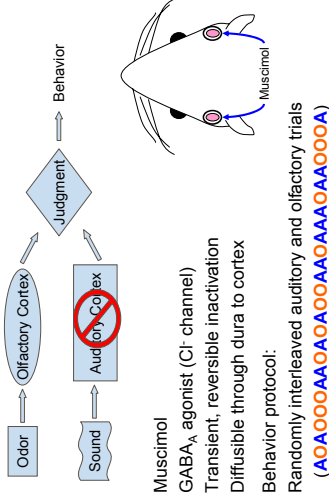
Methods

- Long-Evans rats
- Auditory two alternative forced choice paradigm
- Stimulus: pure tones with a white noise background (right, 1kHz or left, 15kHz)
- Reward: ~50µl water
- Training time: 2-3 weeks
- Typical reaction times: ~400ms
- Performance deteriorated in a systematic way with decreased signal to noise ratio (SNR) and with decreased tone duration.
- Bi-modality: auditory and olfactory
- Odorant: caproic acid and hexanol
- Bilateral inactivation of auditory cortices: Muscimol (GABA_A agonist) (12.5µl, 3.44 µg/µl) soaked in gel-foam, topical application on dura

Muscimol inactivation of auditory cortex impairs auditory but not olfactory performance



Cortical inactivation with internal control



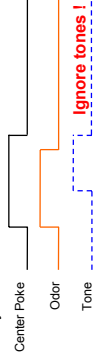
Current Project:

Looking for neural-correlates of modality specific attention

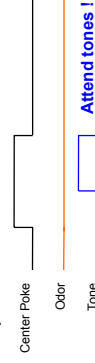
Tetrode recording

Cross-modal auditory attention paradigm:
Alternating auditory and olfactory blocks (50 trials)
(AAAAA OOOOO AAAAA OOOOO AAAAA)

Olfactory blocks:



Auditory blocks:



Summary

1. Training is fast and rats can perform many trials.
2. Response is rapid and extremely accurate.
3. Response decreases with signal to noise ratio and with shortening stimulus duration.
4. Auditory cortex is involved in frequency discrimination behavior of rats.
5. Good model for studying neural correlates of auditory perception.