

## Sex and Smell

- Introduction: genes and chemosensory detection
- Molecular biology of pheromone perception
- Sex-specificity of pheromone responses

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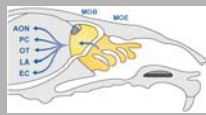
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### Molecular Biology of Olfactory Detection in the Mouse



The vomeronasal system



The main olfactory system

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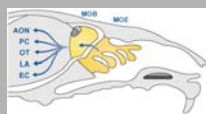
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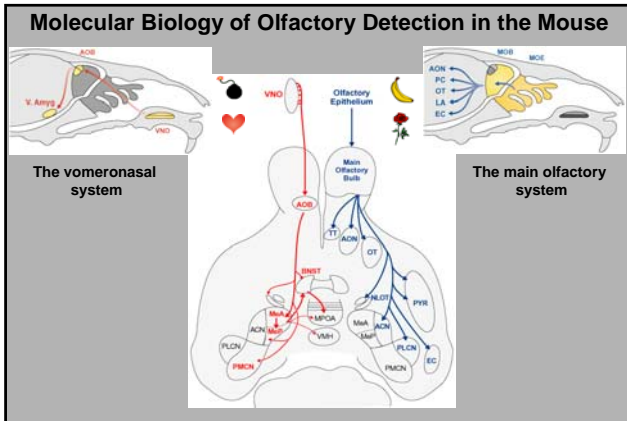
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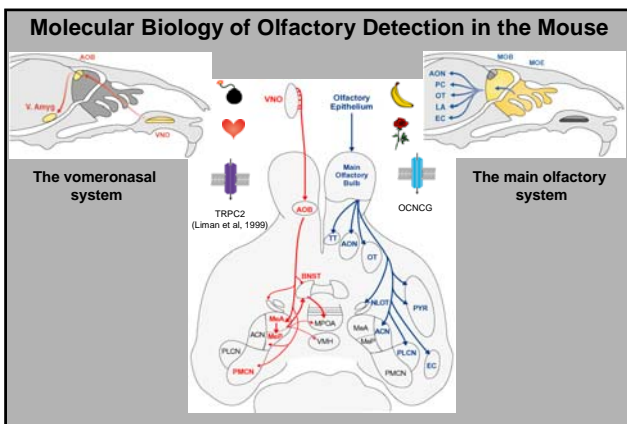
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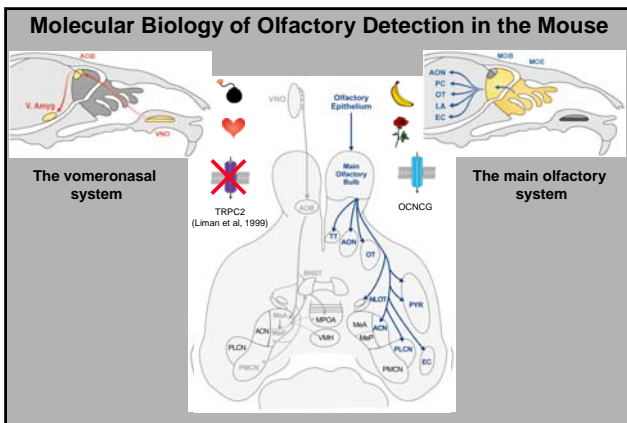
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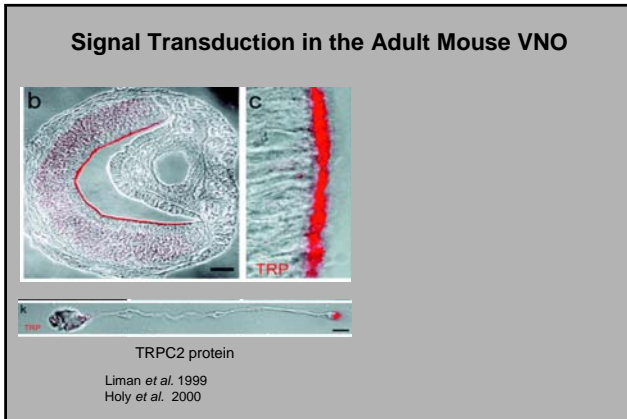
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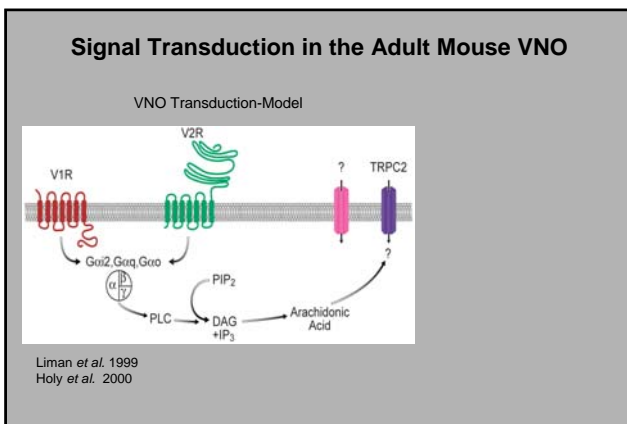
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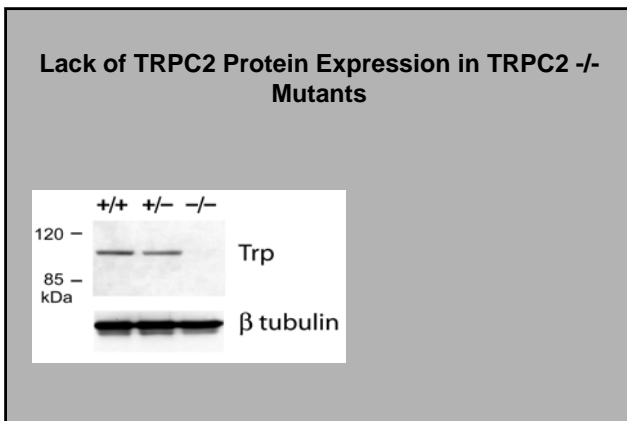
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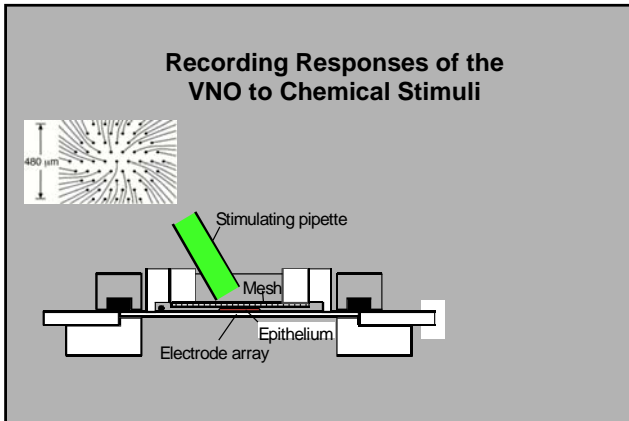
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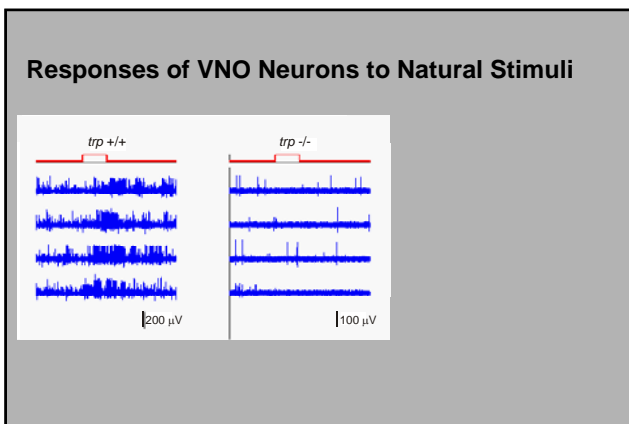
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**“If you put together,  
into the same container,  
two sticklebacks, lizards, robins,  
rats, monkeys, or boys,  
who have not had  
any previous experience with  
each other,  
they will fight.”**

Konrad Lorenz 1964

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**Negative Control**  
**Wild Type Resident + Castrated Intruder**

QuickTime™ and a  
YUV420 codec decompressor  
are needed to see this picture.

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**Positive Control**  
**Wild Type Resident + Pheromone Swabbed Intruder**

QuickTime™ and a  
YUV420 codec decompressor  
are needed to see this picture.

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**Mutant Behavior**  
**TrpC2<sup>-/-</sup> Resident + Pheromone Swabbed Intruder**

QuickTime™ and a  
YUV420 codec decompressor  
are needed to see this picture.

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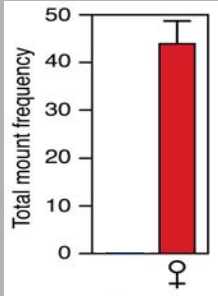
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**Male TRPC2<sup>-/-</sup> Encounters with Female**



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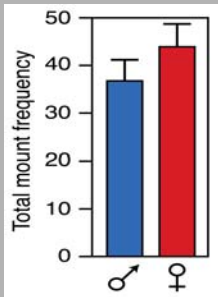
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**Male TRPC2<sup>-/-</sup> Encounters with Female and Male Mice**



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**Behavior of TRPC2<sup>-/-</sup> males**

QuickTime™ and a YUV420 codec decompressor are needed to see this picture.

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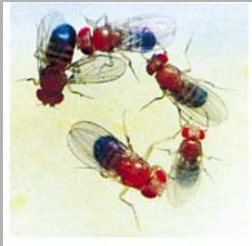
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**The mating chains of the drosophila *fruitless* males**



Ito et al., 1996

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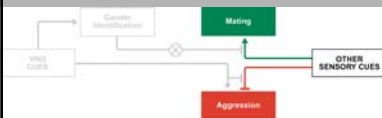
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**Model: Role of the Vomeronasal System in the Mouse**



Stowers et al., Science (2002)  
Leypold et al., PNAS (2002)

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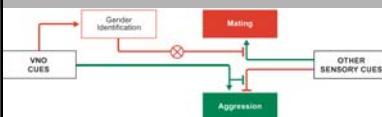
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
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**Various Modes of Gender Identification**



Shell Parakeet

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**Various Modes of Gender Identification**



Shell Parakeet

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**Various Modes of Gender Identification**



Shell Parakeet



American Flicker

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**Various Modes of Gender Identification**

**The Badge of Masculinity**  
Tinbergen 1953



♂

Shell Parakeet



♀ ♂

American Flicker

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**Various Modes of Gender Identification**

**The Badge of Masculinity**  
Tinbergen 1953



♂

Shell Parakeet Lab Mouse



♀ ♂

American Flicker

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**Various Modes of Gender Identification**

**The Badge of Masculinity**  
Tinbergen 1953



♂ ?

Shell Parakeet Lab Mouse Humans



♀ ♂

American Flicker

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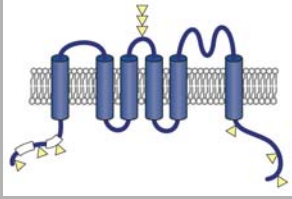
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### The TRPC2 Channel in Primate Evolution



Limán and Innan, PNAS (2003)  
Webb *et al.*, Mol. Biol. Evol. (2004)

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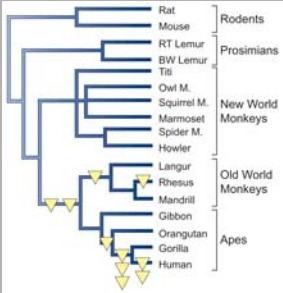
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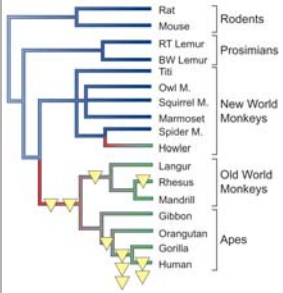
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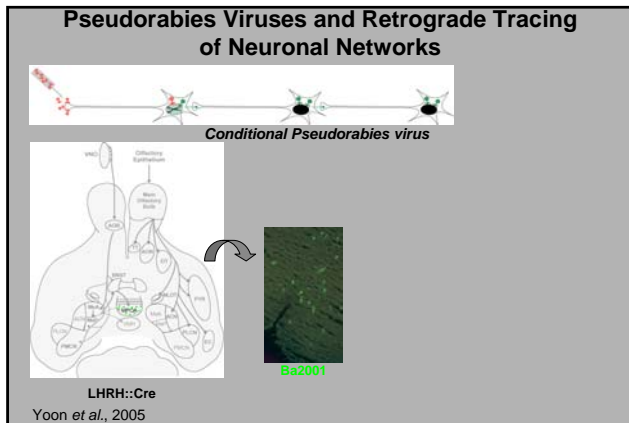
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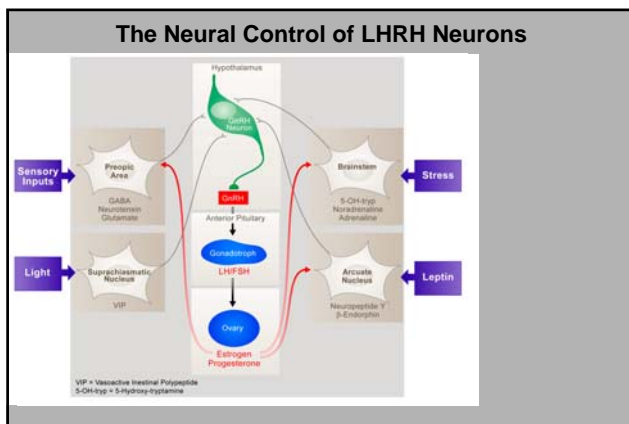
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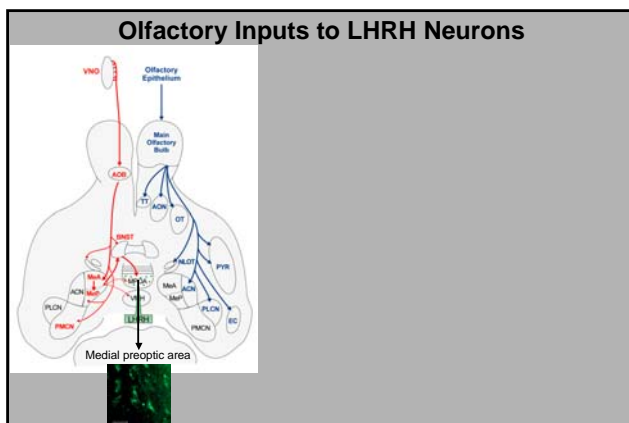
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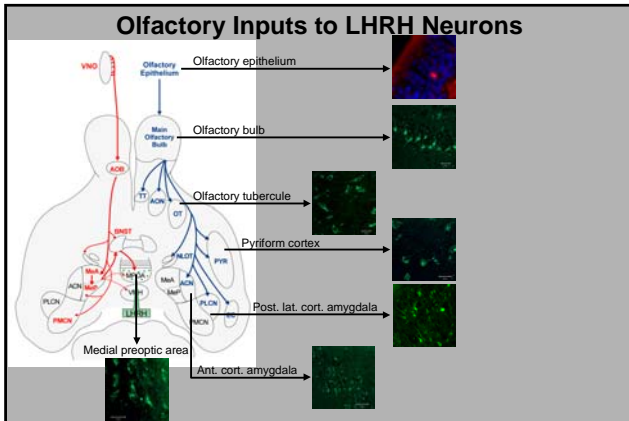
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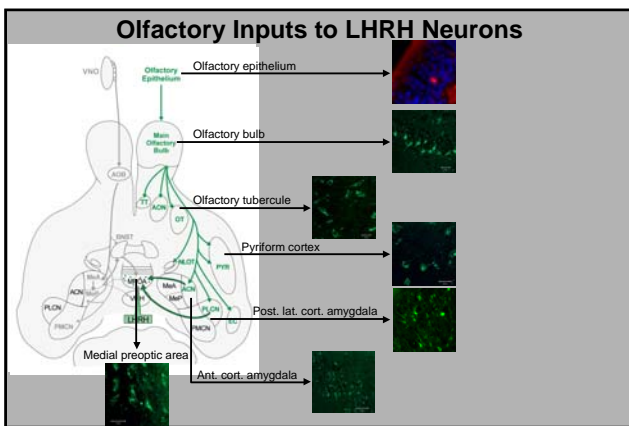
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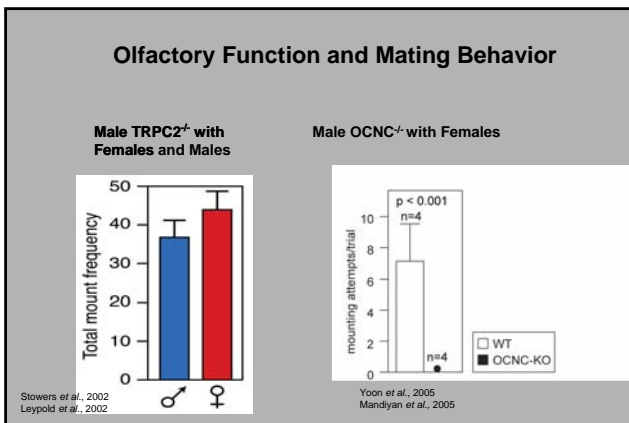
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