Partner preference is modulated by sexual experience in female rats

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**Introduction**

The greater time spent with the male rat during paced mating by sexually experienced compared to naive female rats may indicate enhanced sexual motivation.

We tested whether paced mating experience or vaginocervical stimulation (VCS) alone affected No Contact partner preference in ovariectomized rats under oil and estradiol plus progesterone (EB/P).

Rats then received a test of paced mating behavior 60 min prior to brain collection to measure Fos and nitric oxide synthase (NOS) immunoreactivity in the medial preoptic area (mPOA), a region sensitive to vaginocervical stimulation.

Rats with sexual experience spent a greater time with male under oil than naive and VCS rats and had a shorter latency to enter the male compartment under EB/P than naive rats.

In a test of paced mating behavior, sexually experienced rats spent a greater proportion of time with male rat than naive rats and exhibited more proceptive behaviors in the male rat compartment than naive and VCS rats.

Nitric oxide synthase (NOS) and Fos immunoreactivity were assessed bilaterally in the mPOA of naive and paced rats.

A significantly greater number of NOS-ir cells was observed in the mPOA of paced vs. naive rats, but Fos-ir did not differ between groups.

**Methods**

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment (6x)</th>
<th>Partner Preference Tests</th>
<th>Paced Mating Behavior Test</th>
<th>Perfusion</th>
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<tbody>
<tr>
<td>Naive (n=11)</td>
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<tr>
<td>Paced Mating</td>
<td>(10 intromissions)</td>
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<td>(Test 1: Oil → Test 2: EB/P)</td>
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<td>VCS (n=10)</td>
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**Conclusions**

Motivation to approach an inaccessible sexual partner is comparable under EB/P for sexually experienced, naive, and VCS female rats.

The neural changes that occur after sexual experience, specifically the increased NOS in mPOA, may be related to the different responses to sexual stimulation during paced mating in sexually experienced relative to naive and VCS rats.

The elevated preference for male suggests the male rat maintains incentive value for sexually experienced female rats when they are not hormone primed.

Vaginocervical stimulation alone cannot explain the behavioral changes in sexually experienced rats, indicating that VCS is not the primary feature of mating that alters subsequent behavior.

Future studies should explore whether associative learning, independent of proximate hormonal effects, can explain the increased motivation observed in rats with sexual experience.

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