Autistic features linked to prenatal exposure to fire retardants and phthalates

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The Endocrine Disruption Exchange
CHE EDC Strategies Group
Conference Call
Endocrine disrupting chemicals are present in our daily environment

Phthalates

Resistance
Flexibility
Brightness
Cheap to produce

Flame retardants (PBDEs)

Persistant
Bioaccumulative

www.inhabitots.com  www.medibid.com
www.roseindigo.com  www.nania.com
www.amazon.fr  www.wikirecent.com
www.meublesetatmosphere.com  www.thefelicefiles.com
www.test.litescamotables.net

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April 15th, 2015

Conference Call TEDx / CHE EDC
Epidemiological studies linked endocrine disruptors with behavioral alterations.
Global PBDEs exposure

EWG ‘Toxic Compounds in Toddlers & Preschoolers 3x Higher Than in Moms’. 2008

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Global phthalates exposure

http://www.plasticisers.org/

Source: ECPI estimates
**Our study design**

<table>
<thead>
<tr>
<th>Tests</th>
<th>Age</th>
<th>Behavior tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nest-seeking behavior</td>
<td>P8</td>
<td>Maternal Bonding Communication</td>
</tr>
<tr>
<td>Open field</td>
<td>P20</td>
<td>Hyperactivity Exploration</td>
</tr>
<tr>
<td>Elevated Plus Maze</td>
<td>P25</td>
<td>Hyperactivity Anxiety</td>
</tr>
<tr>
<td>Prepulse Inhibition</td>
<td>P35</td>
<td>Sensorimotor gating</td>
</tr>
<tr>
<td>Social Interactions</td>
<td>P40</td>
<td>Sociability</td>
</tr>
</tbody>
</table>
Results:
Nest seeking behavior test

Endocrine disruptors
Specific to males
Less maternal bonding

Results

Open Field et Elevated Plus Maze


Endocrine Disruptors

Locomotor Hyperactivity


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Results
Social Interactions

Endocrine Disruptors
Alteration of social behavior in males only
Development of strong social avoidance

Results
PrePulse Inhibition of the acoustic startle reflex test (PPI)

Pulse 120 dB:
- For test session
- Evaluation for habituation

Prepulse:
- +4 dB
- +8 dB
- +12 dB
- +16 dB
Preliminary Results
Prepulse Inhibition

Intra individual and Intra group variability

Endocrine disruptors

Figure 5.

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Results Summary

<table>
<thead>
<tr>
<th>Tests</th>
<th>Behavior tested</th>
<th>EEDs</th>
<th>VPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nest-seeking behavior</td>
<td>Maternal bonding</td>
<td>![down]</td>
<td>![down]</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>![male]</td>
<td>![male]</td>
</tr>
<tr>
<td>Open field</td>
<td>Hyperactivity</td>
<td>![up]</td>
<td>![up]</td>
</tr>
<tr>
<td>Elev Plus Maze</td>
<td>Hyperactivity</td>
<td>![up]</td>
<td></td>
</tr>
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<td>![up]</td>
</tr>
<tr>
<td>Prepulse Inhibition</td>
<td>Sensorimotor gating</td>
<td>![variability]</td>
<td>![variability]</td>
</tr>
<tr>
<td></td>
<td>Sensory profile</td>
<td>![variability]</td>
<td>![variability]</td>
</tr>
<tr>
<td>Social Interaction</td>
<td>Sociability</td>
<td>![down]</td>
<td>![down]</td>
</tr>
</tbody>
</table>

We characterized behavioral changes in juvenile rats relevant to autistic features.
Autism is one of the major public health concerns

2014: ONE IN 64
1 boy in 42
1 girl in 189

From Autism Speaks
The developing brain is extremely sensitive to the endocrine disrupting chemicals found in our daily environment.

These chemicals can contribute to the development of autism.
How to reduce our daily exposure?

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April 15th, 2015  
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Thank you

My supervisors

Our lab team

The animal facility staff

Thank you for your attention