SUB-CHRONIC EFFECTS OF SLIGHT PAH- AND PCB-
CONTAMINATED MESOCOSMS IN PARACENTROTUS LIVIDUS
LMK: A MULTI-ENDPOINT APPROACH AND DE NOVO
TRANSCRIPTOMIC

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Natural (such as bioturbation and sea storm) or artificial (such as dredging) perturbative events can release the accumulated contamination causing acute concerns to water column populations and the re-allocation of contaminants within the same aquatic environment.
Experimental design

- **W**
  - Bioaccumulation
    - Theca
    - Gonad
    - Gut

- **W+SED**

- **W+SED+PAHs (192 μg/L)**
  - Embryotoxicity

- **W+SED+PCBs (0.15 μg/L)**
  - Genotoxicity
  - *de novo* Transcriptome
Results

<table>
<thead>
<tr>
<th>Theca + spines [µg/Kg]</th>
<th>Gonads [µg/Kg]</th>
<th>Gut [µg/Kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>W+SED+PAHs W</td>
<td>W+SED+PAHs W</td>
<td>W+SED+PAHs W</td>
</tr>
<tr>
<td>12.4</td>
<td>16.3</td>
<td>&lt;2</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total PAHs</th>
<th>FDR ≤ 0.05</th>
<th>FC ≥ 1.5</th>
<th>FC ≤ -1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>W+SED+PAHs W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W+SED+PCBs W</td>
<td></td>
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</tr>
</tbody>
</table>

Genes
- Treated1 vs Control: 1898, 933, 965
- Treated2 vs Control: 2396, 1079, 1317
- Treated2 vs Treated1: 1356, 755, 601

Isoforms
- Treated1 vs Control: 5591, 2200, 3388
- Treated2 vs Control: 7703, 3715, 3985
- Treated2 vs Treated1: 4762, 2911, 1850
Conclusions

✓ Setting up «closed system» (microcosm) to study possible toxigenic effects of polluted sediment on marine invertebrates

✓ PAHs and PCBs did not affect survival of sea urchins

✓ PAHs and PCBs induced an increase of malformed and/or delayed embryos, compared to negative control (sediment without contaminants and sea water without sediment)

✓ PAHs bioaccumulation have been shown in theca+spines and gonads

✓ PAHs and PCBs induced variation on the expression level of several genes (involved in stress response, skeletogenesis, detoxification and development/differentiation) analyzed by RNA sequencing and Real Time qPCR.