In forensic case work, enzymatic and immunochromatographic assays are used to indicate the presence of semen. The fastest of these tests is the enzymatic assay for acid phosphatase (AP). AP is found in high levels in semen and is found in low levels in other fluids such as vaginal secretions (Jones). AP is also found in high levels in mushrooms (Jones). Therefore mushrooms can serve as a false positive in the AP test for semen.

Antibody-based assays, including P30 and Semenogelin(Sg) immunochromatographic assays, are more time consuming but have less cross-reactivity with other fluids. This is due to the specificity of antibody-antigen interactions. A review of literature of the cross reactivity of fungal samples and P30 or Semenogelin, no results could be found.

This research evaluated cross-reactivity of edible mushrooms in P30 and Semenogelin immunochromatographic tests.

### Objectives

- Collect samples from edible mushrooms and process in the P30 immunochromatographic assay
- Collect samples from edible mushrooms and process in the Semenogelin immunochromatographic assay

### Materials and Methods

**Mushrooms (9)**
- oyster, shiitake, baby bella, chanterelle, trumpet royale, black trumpet, dried porcini, enoki, and dried lobster mushrooms

**Sample Collection**
- 2mm x 2mm sample collected from interior of cap; skin and gills removed (where possible)

Test performed according to manufacture protocol
- ABAcard p30 test for the forensic identification of semen
- RSID-Semen
- Seratec PSA Semiquant (P30)

**Cut Sample**
**Add Buffer**
**Incubate**
**Centrifuge**
**Add Liquid To Cartridge**

Table. Results of Mushrooms tested on the different test kits
Positive and negative controls (middle color) were performed alongside each set of mushrooms that were tested each day. The results were negative for all samples.

<table>
<thead>
<tr>
<th>Sample (mushroom)</th>
<th>ABAcard (P30)</th>
<th>Seratec (P30)</th>
<th>RSID (Sg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Control</td>
<td>positive</td>
<td>positive</td>
<td>positive</td>
</tr>
<tr>
<td>Negative Control</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Oyster</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Shiitake</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Baby bella</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Chanterelle</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Trumpet Royale</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Black Trumpet</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Dried Porcini</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Enoki</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
<tr>
<td>Dried Lobster</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
</tr>
</tbody>
</table>

**Discussion and Future Work**

- The research demonstrated no cross-reactivity of mushrooms in immunochromatographic assays for semen
- Additional work may include:
  - Cutting samples from other locations of the mushroom such as stem
  - DNA extraction of precut samples and quantification of human DNA
  - Microscopic examination of fungal samples

**References**