Agaricomycotina Sexual life cycle
Life Cycle - Hymenomycetes
Clamp connection
Mating Systems in Fungi

**Homothallic (self compatible):**
- **Gametes:** \(a \times a\)
- **Zygote:** \(aa\)
- **Products of meiosis:** \(a\)

*Bipolar Heterothallism (self incompatible): single locus!*
- **Gametes:** \(A \times a\) or \(+ \times -\)
- **Zygote:** \(Aa\) or \(+, - (1:1)\)
- **Products of meiosis:** \(A, a (1:1), +, - (1:1)\)

*Tetrapolar Heterothallism (self incompatible): two loci!*
- **Gametes:** \(AB, Ab, aB, ab\)
- **Zygotes:** \(AaBb\)
- **Products of meiosis:** \(AB, Ab, aB, ab (1:1:1:1)\)

Mating Reactions in Tetrapolar Systems (simple version, 2 genes)

<table>
<thead>
<tr>
<th>gametes</th>
<th>AB</th>
<th>Ab</th>
<th>aB</th>
<th>ab</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>[AABB]</td>
<td>(AABb)</td>
<td>(AaBB)</td>
<td>AaBb</td>
</tr>
<tr>
<td>Ab</td>
<td>(AABb)</td>
<td>[AAbb]</td>
<td>AaBb</td>
<td>(Aabb)</td>
</tr>
<tr>
<td>aB</td>
<td>(AaBB)</td>
<td>AaBb</td>
<td>[aaBB]</td>
<td>(aaBb)</td>
</tr>
<tr>
<td>ab</td>
<td>AaBb</td>
<td>(Aabb)</td>
<td>(aaBb)</td>
<td>[aabb]</td>
</tr>
</tbody>
</table>

Shaded = compatible (complete clamp connections, produce spores)
[ ] = Incompatible (No go!)
( ) = Partially compatible
A – controls nuclear pairing, initial formation of clamps, conjugate division of nuclei, septation of clamp
B – controls nuclear migration, completion of clamp connections
* Can have multiple alleles, i.e., more than two, e.g., A1, A2, A3, etc.
! Secondary Homothallism, 2-spored basidia
Check your kit!!