wtf: Killing gametes for more than 110 million years

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Phylogenetic analysis suggests wtf genes are 110 million years old

Birth of wtf genes?

<table>
<thead>
<tr>
<th>Species</th>
<th># of PSI-BLAST and BLASTn hits</th>
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</thead>
<tbody>
<tr>
<td>S. octosporus</td>
<td>83</td>
</tr>
<tr>
<td>S. osmophilus</td>
<td>42</td>
</tr>
<tr>
<td>S. cryophilus</td>
<td>5</td>
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<tr>
<td>S. pombe</td>
<td>25</td>
</tr>
<tr>
<td>S. japonicus</td>
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</tbody>
</table>

S. octosporus, S. osmophilus and S. cryophilus wtf genes share features with S. pombe meiotic drivers

- wtf genes are present in S. octosporus, S. osmophilus, S. cryophilus and S. pombe
- wtf genes are associated with dispersed repetitive sequences which may allow them to duplicate in the genome by gene conversion
- wtf genes of the four species encode poison and antidote proteins
- S. octosporus wtf gene cause meiotic drive in S. octosporus
- wtf genes have been meiotic drivers for at least 110 million years

References: Nuckolls and Bravo Núñez et al. (2017); Hu et al. (2017), Rhind et al. (2011)
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