Neurospora chromosome rearrangements with mutant phenotypes provide an opportunity to sequence breakpoint junctions

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Abstract

Neurospora chromosome rearrangements with mutant phenotypes provide an opportunity to sequence breakpoint junctions

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Twenty-two chromosome rearrangements in Neurospora are associated with mutations at known gene loci (Table 1). A majority of the implicated loci have been cloned and the wild type alleles of a number of them have been sequenced. The way is thus open for determining numerous additional breakpoint junctions. Rearrangement strains are available from FGSC and are listed in the Neurospora Stock List, both in Part I (single mutants) and in Part VI (aberrations). Information on each rearrangement has been summarized for a forthcoming review, and I will be glad to provide copies on request. The Stock Center might well act as a clearing house to avert possible duplication of effort by anyone interested in sequencing junctions.

A caveat: For rearrangements that are placed in Table 1 solely on the basis of genetic linkage, the number of scored segregants is often not great and the possibility exists that a breakpoint is closely linked to the locus but is potentially separable by recombination. This applies to the *os-2* translocation and to most of the other rearrangements that are associated with genes having morphological or visible phenotypes. Separability is also possible though unlikely for *ad-3A, ad-3B, met-7, nic-2, ser-6*, and *thi-1*.

Table 1. Rearrangements associated with mutant phenotypes that are allelic with genes at established loci

<table>
<thead>
<tr>
<th>Mutant locus</th>
<th>Rearrangment</th>
<th>Genetic References</th>
<th>Molecular References</th>
</tr>
</thead>
<tbody>
<tr>
<td>ad-3A (IR)</td>
<td>T(IR&lt;-&gt;IV)Y112M15 ad-3A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T(IR;IIR;IIIR)Y155M64 ad-3A</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ad-3B (IR)</td>
<td>T(IR-&gt;IIIR)Y112M4i ad-3B</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>al-1 (IR)</td>
<td>T(IR;IIR)4637 al-1</td>
<td>1, 3</td>
<td>5, 6</td>
</tr>
<tr>
<td>am (VR)</td>
<td>In(VR-&gt;VL)UK2-y am</td>
<td>4</td>
<td>5, 6</td>
</tr>
<tr>
<td></td>
<td>T(VR;VIL)UK9-18 am</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T(IIL;VR)mpr13-1 am</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T(VR;VIL)mpr15-2 am</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
The normal-sequence wild type allele has been cloned for all loci except ad-3A, ad-3B, cut, nic-2, os-2, pk, ser-6, and thi-1.

References:

11. Schmidhauser, T. J., personal communication.