Leslie, J. F.*

# Reciprocal translocation AR30 has a breakpoint distal to all know IIL markers.

T(IIL;VL)AR30 is a reciprocal translocation first described by Perkins and Barry (1977 Adv. Genet. 19: 113-285). Recently this rearrangement has been used in the synthesis of a complex chromosome rearrangement (Leslie, manuscript in preparation), and additional mapping data for both breakpoints were obtained. The II breakpoint is distal to all known markers on IIL, while the V breakpoint is distal to caf-l on VL.

Three crosses were used to map the IIL breakpoint. Data from the cross T AR30 x Normal pi pyr-4 (Table I, cross A) place the AR30 breakpoint outside and a considerable distance from the pi pyr-4 region although the direction is not certain. The off-ratios in the first two classes can be attributed to decreased germination and/or growth of pi progeny.

**TABLE 1**

**Crosses mapping AR30 breakpoint**

| | | | | | | crossovers | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Parentals | I | II | III | I& II | I& III | II& III | I, II &III |
| | | I | II | | | | | | | | | |
| A. | N | pi | pyr-4 | | 23 | 29 | 3 | | 2 | | | |
| | AR30 | + | + | | 84 | 7 | 2 | | 5 | | | |
| | | I | | | | | | | | | | |
| B. | AR30 | pyr-4 | + | | 28 | 6 | | | | | | |
| | AR30 | + | arg-5 | | 30 | 12 | | | | | | |
| | | I | II | III | | | | | | | | |
| C. | AR30 | + | ure-3 | fl | + | 29 | 26 | 16 | 6 | 4 | 2 | 1 | 0 |
| | AR30 | arg-5 | + | + | rip | 36 | 12 | 8 | 8 | 2 | 1 | 5 | 0 |
| | | I | II | | | | | | | | | |
| D. | N | caf-1 | at | | | 17 | 5 | 4 | | 0 | | | |
| | AR30 | + | + | | | 19 | 5 | 2 | | 0 | | | |

A. The number of normal (N) progeny for each class is given in the upper line.
The number of AR30 progeny in the reciprocal classes is given in the lower line.
B. The number of pyr-4 progeny for each class is given in the upper line.
The number of pyr-4+ progeny in the reciprocal class is given in the lower line.
C. The number of arg-5+ progeny for each class is given in the upper line.
The number of arg-5 progeny in the reciprocal class is given in the lower line.
D. The number of normal (N) progeny far each class is given in the upper line.
The number of AR30 progeny in the reciprocal classes is given in the lower line.

Data from crosses homozygous for AR30 are also shown in Table I. In homoygous translocation crosses, markers distal to the IIL breakpoint will segregate independentlv of markers proximal to the IIL breakooint. Markers on VL behave similarly.' Cross B in Table I (AR30 pyr-4 x AR30 arg-5); indicates that pyr-4 and arg-5 remain linked so the AR30 breakpoint is not between pyr-4 and arg-5. Similarly, cross C shows that arg-5 is linked to ure-3, ure-3 is linked to fl, and fl is linked to rip: P <0.001 from Chi-square tests for independence, for all four intervals. Thus, the II breakpoint of AR30 is on IIL distal to the known genetic markers but not terminal.

Data from the cross T AR30 x Normal at caf-1 Table I, cross D) show that the VL breakpoint is distal to caf-1. Perkins, Raju and Barry (1980 Chromosoma 76: 255-275) have shown cytologically that the AR30 breakpoint is proximal to the nucleolus organizer. Thus, the VL breakpoint of AR30 is between caf-1 and the nucleolus organizer.

A word of caution regarding this rearrangement is necessary. In heterozygous crosses (AR30 x normal sequence) many defective ascospores turn black. Instead of the 50% black spores expected from a reciprocal rearrangement crossed with normal sequence, about 85% of the shot spores from AR30 xNormal are black (the percentage of black spores increases with age). Consequently, the viability of the black spores from such a cross can be as low as 25 to 30%. In crosses homozygous for AR30 a normal situation prevails - 90 to 95% black spores are shot and 90 to 95% of the spores are viable. Thus, scoring AR30 visually by percent of shot black spores can be done only with practice, preferably by making comparisons of the tested stock when crossed with a known rearrangement tester and when crossed with a known normal-sequence tester. AR30 stocks containing fluffy are useful for such tests, and both T(IIL;VL)AR30 flA (FGSC #3948 and T IIL:VL AR30 fl a (FGSC #3949) have been deposited with FGSC. I have also deposited T(IIL;VL)AR30 caf-1 At a FGSC #3950) and T(IIL;VL)AR30 caf-1 at a (FGSC #3951) which should be useful in detecting extremely distal IIL markers by linkage to caf-1 and at. (Supported by Public Health Service Grant AI-01462.) - - Department of Biological Sciences. Stanford University. Stanford. California 94305.
*Present address; Research and Development Division; International Minerals & Chemical Corporation, Terre Haute, Indiana 47808.

TABLE 1

Rates of growth and fungicide resistance of osmotic mutants of *Neurospora crassa*

| Locus | Allele or isolation number | FGSC stock number | Rate of growth[a] | | | | Resistance to fungicides[b] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MM | CM | MM + 2% NaCl | MM + 4% NaCl | procymidone | iprodione | vinclozolin | chloroneb | dicloran | quintozene |
| os-1 | M16 | 812 | 50 | 19 | 0 | 5 | +++ | + | +++ | +++ | ++ | ++ |
| | M155-1 | 824 | 61 | 23 | 5 | 0 | +++ | + | +++ | ++ | + | + |
| | B135 | 951 | 49 | 7 | 0 | 0 | +++ | ++ | +++ | +++ | ++ | +++ |
| | P668 | 973 | 50 | 44 | 0 | 0 | +++ | +++ | +++ | +++ | ++ | +++ |
| | NM233(t) | 1287 | 92 | 80 | 40 | 0 | +++ | +++ | +++ | ++ | ++ | +++ |
| | P3282 | 1508 | 46 | 23 | 0 | 0 | +++ | + | +++ | +++ | ++ | +++ |
| | NM204(t) | 1637 | 80 | 60 | 9 | 0 | +++ | ++ | +++ | ++ | ++ | ++ |
| | P3282 | 1644 | 49 | 11 | 0 | 0 | +++ | + | +++ | +++ | ++ | +++ |
| | AR2 | 1675 | 63 | 21 | 0 | 0 | +++ | ++ | +++ | ++ | ++ | +++ |
| | P5990 | 2432 | 51 | 14 | 0 | 0 | +++ | ++ | +++ | +++ | ++ | +++ |
| | P6549 | 2584 | 64 | 23 | 0 | 0 | +++ | ++ | +++ | +++ | ++ | +++ |
| os-2 | UCLA80 | 2238 | 106 | 109 | 62 | 8 | ++ | ++ | ++ | + | ++ | + |
| | UCLA93 | 2240 | 98 | 95 | 45 | 0 | ++ | ++ | ++ | + | ++ | + |
| os-4 | NM2010 | 2429 | 106 | 112 | 58 | 32 | ++ | ++ | ++ | + | + | + |
| os-5 | NM2160 | 1638 | 98 | 98 | 47 | 0 | ++ | ++ | ++ | + | + | + |
| flm-1 | Y256M209 | 3624 | 94 | 76 | 48 | 0 | +++ | ++ | +++ | ++ | ++ | +++ |
| flm-2 | Y256M223 | 2668 | 98 | 93 | 90 | 60 | ++ | ++ | ++ | + | ++ | + |
| cut | LLM1 | 2385 | 96 | 102 | 43 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| gla | T9M150 | 3428 | 58 | 58 | 28 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| | T9M150 | 3429 | 108 | 116 | 92 | | 0 | 0 | 0 | 0 | 0 | 0 |

[a] Increase in colony diameter, mm/24 hr, at 26°C; mean of 3 replicates. CM = MM supplemented with 0.5% casamino acids and 0.5% yeast extract.

[b] 0 = sensitive ($ED_{95}$ < 2µg fungicide/ml); + = low resistance ($ED_{95}$ >2<10µg/ml); +++ = high resistance ($ED_{50}$ >50µg/ml; $ED_{95}$ >100µg/ml); ++ = intermediate levels of resistance. ED values are the concentrations of fungicide in agar media that reduce radial growth by 50% or 95%.