

Special purpose Neurospora stocks

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Abstract

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methods of employing them are widely scattered, and in some cases have not been published. Listings in the FGSC stock list are necessarily according to genotype, and the potential uses of many stocks may not be obvious from their genotypes.

The object of this note is to call attention to the availability and potential usefulness of some stocks in categories with which we have had experience. Specific strains are listed under six main headings:

- I. Linkage testers
- II. Mating-type and aberration testers
- III. Stocks for testing heterokaryon compatibility at the het-c locus
- IV. Stocks for replication
- V. Autonomous ascospore-color mutants
- VI. Reference strains for Neurospora species.

FGSC numbers are given for all stocks. A few key references are given, by code number if included in the Bachmann and Strickland (1965) or Bachmann (1970) bibliographies. In many cases more detailed references can be obtained from the FGSC stock list. Comments on some of the stocks are gathered sequentially following the list, and the approximate map locations of all markers are shown in a figure.

Other categories of special-purpose stocks have been described and listed by other workers. Among these are the Wilson-Garnjobst series of stocks for testing het-c, -d, and -e in heterokaryons with forcing markers (Ref. XW70, listed in Part VI of the current FGSC stock list), the kit of stocks devised by Metzberg and Ahlgren for introgressing genes between *N. tetrasperma* and *N. crassa* (listed in Ref. XM62; see also 1970 Genetics 68: 369), stocks that produce microconidia for plating (pe fl A and a, FGSC# 867 and 868, Ref. B36. Also cr rg; pe fl A, FGSC# 331, Ref. XC53), and stocks for selective enrichment of mutants (inos 89601, Ref. L53, and the temperature-sensitive *Trnas*, 83201t (Sullivan and DeBusk 1971 Neurospora Newsl. 18: 13.)).

List of special-purpose Neurospora stocks

Category and genotype	FGSC#	Category and genotype	FGSC#
I. Linkage testers		C. Testers for extremes of individual linkage groups; (with or without intermediate markers)	
A. alcoy testers: (Ref. XP28, pp. 249-252)		LG I. w-5 A al-1 R	2177
T(I;II)4637 al-1; T(IV;V)R2355, cot-1; T(III;VI)1, ylo-1		un-5 a al-1 R	2178
alcoy A:	997	fr A al-1 R	2087
alcoy a:	998	fr a al-1 R	2088
Follow-up testers for use with alcoy:		LG II. col-10 tryp-3 A	2071
aur; pe A (I;II)	1203	col-10 tryp-3 a	2072
aur; pe a	1204	LG 111. acr-2 dow A	2036
aur; arg-5 A	1205	acr-2 dow a	2037
aur; arg-5 a	1204	acr-2 tryp-1 dow A	2125
cot-1; inos A (IV;V)	1243	acr-2 tryp-1 dow a	2126
cot-1; inos a	1244	LG IV. cyr-10 uvs-2 A	1989
tryp-1; ylo-1 A (III;VI)	1207	cys-10 cot-1 uvs-2 A	2017
tryp-1; ylo-1 a	1208	cys-10 cot-1 uvs-2 a	2018
aur; arg-5; cot-1; inos A	1885	LG V. at hirt-6 A	1991
aur; arg-5; cat-1; inos a	1886	at hist-6 a	1992
aur; arg-5; tryp-1; ylo-1 A	2124	at al-3 hirt-6 A	2089
aur; arg-5; tryp-1; ylo-1 a	1888	at al-3 hist-6 a	2090
tryp-1; cot-1; inos; ylo-1 A	1987	LG VI. chol-2 tryp-2 A	1087
tryp-1; cot-1; inos; ylo-1 a	1988	chol-2 tryp-2 a	1088
B. Multiply-marked centromere testers: (Ref. Perkins NN#15)		chol-2 ylo-1 tryp-2 A	2091
bol; w-2; pdx; ot; ylo-1; wc		chol-2 ylo-1 tryp-2 a	2092
multicent A:	2014	LG VII. nit-3 wc sk A	2073
multicent a:	2015	nit-3 wc sk a	2074
acr-2; pdx; at; ylo-1; wc A	1985	nit-3 wc arg-10 A	157
ocr-2; pdx; at; ylo-1; wc a	1986		

List of special-purpose *Neurospora* stocks (cont'd.)

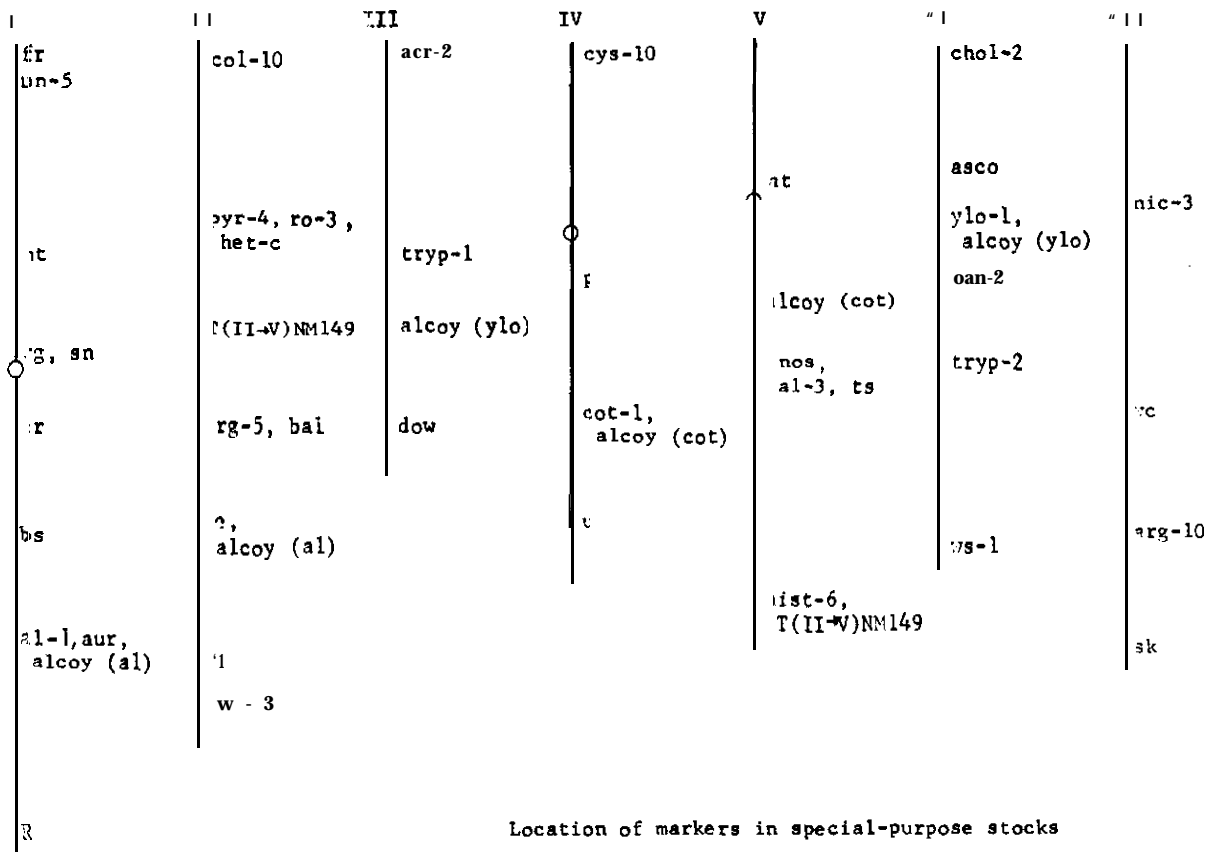
Category and genotype	FGSC#	Reference	Category and genotype	FGSC#	Reference
II. <u>Mating-type and aberration tester</u>			v. <u>Autonomous ascospore-color mutants.</u> Landner 1971 Heredity 27: 385.		
fl ^P A	1838		asco a, A	405,210,	S152, XM58
fl ^P a	1690		ts A	821	XN3, N3, N5
III. <u>Stocks for testing heterokaryon compatibility at the het-c locus.</u> See list in Table 2 of Perkins NN#19 "Presumed new alleles of <u>het-c</u> "; also XP26, XP27.			ws-1 A, a	1434,, 1435	XP31, xP32
IV. <u>Stocks for replication.</u>			ws-2 a	1617	
sn cr-1 A	2001	Perkins 1971	bs A, a	1780,	1781
sn cr-1 a	2002	NN#18:12.	pan-2 A	465	XT22, XT24
rg cr-1 A	624	M33, Schroeder	VI. <u>Reference strains for Neurospora species.</u>		
rg cr-1 a	418	1970 M. G. G. 107: 291.	<u>Neurospora crassa.</u>		
rg cr-1; pe fl A	331		74-OR23-1 A	987	XC17
cr-1 A	487		74-0138-1 a	988	
cr-1 a	488		fl ^P A	1838	
cot-1 A	75	R48, R52, Littlewood	fl ^P a	1690	
cot-1 a	80	and Munkres 1972 J. Bacteriol. (June)	<u>Neurospora tetrasperma.</u>		
			85 A	1270	XH64, XH61
			85 a	1271	
			<u>Neurospora sitophila.</u>		
			P8085 A	2216	D71, S89, Perkins 1972
			P8086 a	2217	NN#19.

Comments on specific stocks and their use.

1. A. alcoy testers have the advantage of involving no nutritional markers and requiring no transfers to special test media. They are capable of detecting linkage of most new mutants, but by no means all. alcoy markers in I, III, IV and V are not near centromeres, and VII is unmarked.
 - tyrp-1 (in follow-up stocks) can be scored without transfer, by UV-fluorescence, if grown on minimal + indole. un-5 was formerly called un(b39t).
- B. Multicent is more likely than alcoy to reveal linkage of genes in the left arms of groups I-V, and VII is marked. Multicent is especially useful for determining which linkage groups are involved in translocations. It can also be used for point mutants, and is useful especially with temperature-sensitive mutants, for which alcoy is unsuitable because cot-1 is a marker.
- C. The most distal known markers in several arms are not practical to use because of problems of fertility, viability or scoring. Combinations of markers in these testers are therefore often compromiser, and the markers used may not be terminal. See Ref. XP28, pp. 273-274, for summary of terminal markers.
 - LG I. Use only as fertilizing parent. R is female-sterile.
 - LG II. tryp-3 grows well on tryptophan + phenylalanine.
 - LG III. tryp-1 can be grown on minimal + indole and scored by UV-fluorescence.
 - LG IV. cys-10 grows well on casein hydrolysate but poorly on methionine, so uvs-2 is scored on plates containing 3% agar + sorbose minimal + NZ-case, and drops of conidial suspension are spotted as described by Stadler and Smith (XS90).
 - LG V. Use minimal + histidine, not complete, to avoid inhibition of hist-6 on complete, and incidentally to maximize clarity of at scoring.
 - LG VII. sk is female-sterile. For optimal growth of arg-10 use 0.5-1 mg arginine per ml.
- III. By crossing T(III→VR)NM149 x Normal sequence, duplications are obtained that cover the het-c locus. If the parents carry different het-c alleles, this is signalled by an abnormal phenotype in the heterozygous duplication progeny.
- IV. All but rg cr are homozygous fertile
- V. Z-molar sucrose (XM58) or propylene glycol (Landner 1971 Heredity 27:385) are recommended as mounting fluids to prevent disruption of linear asci.

V. Use of pan-2 as a spore-color marker requires that pantothenate not be present in the crossing medium (XT22). Probably other classes of nutritional mutants could be used in a similar way. e.g., cys-3 and other cysteine mutants (XM109) (XM109).

VI. "Type" strains representing each of the described *Neurospora* species are needed for testing new isolates from nature. Because morphological variability within the same species is known to be great, crossability, fertility, and chromosome sequence are likely to be more valid criteria of biological relationships than are the predominantly morphological features on which descriptions of the established taxonomic species have been based. Oak Ridge wild-types, and fluffies derived from OR, are used as *N. crassa* standards in our laboratory. Other commonly used wild-types, e.g., Emerson or Lindgren, would be equally valid. The fl strains, being highly fertile and unencumbered with conidia, are ideal as protoperithecial parents in crosses with unknowns and in interspecific crosses.



Location of markers in special-purpose stocks