Fungal Genetics Reports

Volume 37 Article 20

Linkage mapping of the gpdA gene of Aspergillus nidulans

P. J. PUNT
Medical Biological Laboratory TNO

P. A. GREAVES
Medical Biological Laboratory TNO

CAM J. J. VAN DEN HONDEL
Medical Biological Laboratory TNO

Recommended Citation

PUNT, P. J., P.A. GREAVES, and C.J. VAN DEN HONDEL (1990) "Linkage mapping of the gpdA gene of Aspergillus nidulans," *Fungal Genetics Reports*: Vol. 37, Article 20. https://doi.org/10.4148/1941-4765.1485

Linkage mapping of the gpdA gene of Aspergillus nidulans

Abstract

In the last few years many genes of several Aspergillus species have been cloned and sequenced. For many of these genes mutant alleles and genetic linkage data are also available. However, for those genes for which no mutant alleles have been isolated, genetic mapping was not possible. Here we report linkage mapping of the glyceraldehyde-3- phosphate dehydrogenase gene (*gpdA*) of *A. nidulans* for which no mutant alleles have been isolated. The method used is applicable to all other cloned genes.

Linkage mapping of the *gpdA* gene of *Aspergillus nidulans*

P.J. Punt, P.A. Greaves and C.A.M.J.J. van den Hondel - Medical Biological Laboratory TNO, Lange Kleiweg 139, P.O. Box 45, 2280 AA Rijswijk, The Netherlands.

In the last few years many genes of several Aspergillus species have been cloned and sequenced. For many of these genes mutant alleles and genetic linkage data are also available. However, for those genes for which no mutant alleles have been isolated, genetic mapping was not possible. Here we report linkage mapping of the glyceraldehyde-3- phosphate dehydrogenase gene (*gpdA*) of *A. nidulans* for which no mutant alleles have been isolated. The method used is applicable to all other cloned genes.

Transformation in Aspergillus frequently occurs by homologous recombination between host and vector sequences. Although the frequency of homologous recombination does not need to be identical for different sequences, a vector containing sequences of the gene to be mapped will often integrate at the chromosomal locus of this gene. In this way, *A. nidulans* ArgB[pAN5-41B]15 was obtained (vector pAN5-41B contains the *lacZ* gene fused to the promoter region of the *gpdA* gene of *A. nidulans* ; Van Gorcom et al. 1986 Gene 48:211-217). Southern blot analysis has shown that this strain contains a single copy of a (functional) *lacZ* gene at the *gpdA* locus. Parasexual analysis of this strain with master strain MSE (*A. nidulans* FGSC A288) was carried out. Segregation of the *lacZ* marker (integrated at the *gpdA* locus) was analysed (Table I).

Table I. Linkage group assignment

	I	II	III	IV	V	VI	VII	VIII
FGSC A288	yA2	wA3	galA1	pyroA4	facA303	sB3	nicB8	riboB2
gpdA:lacZ(a)	62/64	2/139	47/121	72/135	63/139	ND	61/133	59/138
	*	1%	39%	53%	45%	ND	45%	43%
ArgB[pAN5-41B]15	biA1	-	argB2	methG2	-	-	-	-
gpdA:lacZ	63/138	-	**	66/138	-	-	-	-
	46%	-	-	48%	-	-	-	-

a - the number and % of recombinants is given; two independent diploids were analysed. The markers located at both arms of chromosome IV (*pyroA4* and *methG2*) gave 25/133 (19%) recombinants in this experiment.

* - *wA3* is epistatic to *yA2*
** - only ArgB+ segregants were analysed

From the results in Table I we conclude that the *lacZ* gene is significantly linked to *wA3* at chromosome II: thus, *gpdA* is located on chromosome II. Using suitable linkage group II strains the location of *gpdA* on chromosome II can be mapped similarly, although the presence of duplicated sequences in ArgB[pAN5-41B]15 could disturb normal segregation in sexual crosses.