

Radford, A. Gene-enzyme
correlations in Neurospora

The following list is a revision of the correlations listed in Radford (1976), C.R.C. Handbook of Biochemistry, 3rd Edition. Other recent partial lists are given in Mishra (1977), Advances in Genetics 19, and Fincham, Day and Radford (1978), Fungal Genetics, 4th Edition.

In not all cases are the genes listed the actual structural genes for the enzymes, some being regulatory, and some others possibly regulatory.

Where possible, references are given to the bibliographies of Bachmann and Strickland (1964) and Bachmann (1971). Only references after 1970, and occasional references before that date but not listed in those bibliographies, are listed in full at the end of this paper.

Gene	Enzyme or Other Function	Reference	Gene	Enzyme or Other Function	Reference
<u>acu-2</u>	oxoglutarate dehydrase	XF30	<u>gln</u>	glutamine synthetase	R36a
<u>acu-3</u>	isocitrate lyase	14	<u>gpi-1</u>	glucose isomerase	22
<u>acu-5</u>	acetyl coA synthetase	XF30	<u>gpi-2</u>	glucose isomerase	22
<u>acu-6</u>	PEP carboxykinase	5	<u>his-1</u>	imidazole glycerol phosphate dehydrase	A29, A30
<u>ad-1</u>	AICAR formyl transferase, IMP cyclohydrolase	28	<u>his-2</u>	PRPP pyrophosphorylase	A29
<u>ad-3A</u>	CAIR to SAICAR	XF20	<u>his-3</u>	phosphoribosyl-ATP-dephosphorylase and histidinol dehydrogenase	A29
<u>ad-3B</u>	AIR to CAIR	XF20	<u>his-4</u>	histidinol phosphate phosphatase	A29, A30
<u>ad-4</u>	adenylosuccinase	W103	<u>his-5</u>	imidazol acetol phosphate transaminase	XS56
<u>ad-8</u>	adenylosuccinate synthetase	123	<u>hom</u>	aspartate- β -semialdehyde dehydrogenase	XJ5
<u>aga</u>	arginase	19	<u>ilv-1</u>	dihydroxyacid dehydrase	M190, 2
<u>alc</u>	allantoicase	26	<u>ilv-2</u>	α -keto- β -hydroxyacyl reductoisomerase	XW2
<u>aln</u>	allantoinase	26	<u>ilv-3</u>	pyruvate α -ketoacyl condensing enzyme	XW2
<u>am</u>	NADP-glutamate dehydrogenase	F37	<u>inv</u>	glucocycloaldolase	XP34
<u>amy(exo-1)</u>	α -amylase, glucoamylase, β -fructo-furanosidase and trehalase regulation	XG42	<u>inv</u>	invertase	XS9
<u>arg-1</u>	argininosuccinate synthetase	N31	<u>leu-1</u>	β -isopropylmalate dehydrogenase	XG62
<u>arg-2</u>	arginine-specific carbamoyl phosphate synthase	XD8, 33	<u>leu-2</u>	isopropylmalate isomerase	XG62
<u>arg-3</u>	arginine-specific carbamoyl phosphate synthase	33	<u>leu-3</u>	IPM isomerase and β -IPM dehydrogenase regulation	XG62
<u>arg-4</u>	acetylornithine glutamate transacetylase	8	<u>leu-4</u>	α -IPM synthetase	XG62
<u>arg-5</u>	acetylornithine transaminase	XM82	<u>leu-5</u>	leucyl-tRNA synthetase	XP52
<u>arg-10</u>	argininosuccinase	F42	<u>lys-4</u>	saccharopene-cleaving enzyme (yielding lysine)	13
<u>arg-12</u>	ornithine carbamoyl transferase	D16a	<u>met-2</u>	cystathionase II	XF35
<u>aro-1</u>	dehydroshikimic reductase	XG23	<u>met-3</u>	cystathionine- δ -synthase	13
<u>aro-2</u>	dehydroquininate synthetase	XG23	<u>met-5</u>	homoserine acetylase	XN2
<u>aro-3</u>	chorismate synthetase	XG23	<u>met-6</u>	homoserine-methionine transmethylase	13
<u>aro-4</u>	3-enolpyruvylshikimic acid- β -phosphate synthetase	XG23	<u>met-7</u>	cystathionine- β -synthase	13
<u>aro-5</u>	shikimate kinase	XG23	<u>mig</u>	trehalase migration	XS125
<u>aro-6</u>	DAHP synthetase (tyrosine)	XH7	<u>nit-1</u>	nitrate reductase - flavoprotein component	15
<u>aro-7</u>	DAHP synthetase (phenylalanine)	XH7	<u>nit-2</u>	nitrogen regulation	XS76, 26
<u>aro-8</u>	DAHP synthetase (tryptophan)	XH7	<u>nit-3</u>	nitrate reductase (NADPH-cytochrome reductase)	3
<u>aro-9</u>	dehydroquinase (synthetic)	XG23	<u>nit-5</u>	nitrate reductase	XS76
<u>ars</u>	aryl sulfatase	XM61	<u>nuc-1</u>	nuclease	16
<u>bal</u>	glucose-6-phosphate dehydrogenase	30	<u>nuc-2</u>	nuclease	16
<u>cel</u>	fatty acid chain elongation	11	<u>ota</u>	ornithine- β -transaminase	XD16
<u>chol-1</u>	phosphatidyl ethanolamine N-methyl transferase	XS14	<u>oxD</u>	D-amino acid oxidase	O6
<u>chol-2</u>	phosphatidyl mono(di)-methyl ethanolamine N-methyl transferase	XS14	<u>pcon</u>	phosphatase regulation	16, 20
<u>col-2</u>	glucose-6-phosphate dehydrogenase	XB115	<u>phe-2</u>	prephenic dehydratase	XE12
<u>col-3</u>	6-phosphogluconate dehydrogenase	1, 29	<u>pho-2</u>	alkaline phosphatase	20
<u>col-10</u>	6-phosphogluconate dehydrogenase	1, 29	<u>pho-3</u>	acid phosphatase	24
<u>cr-1</u>	adenyl cyclase	32	<u>pk</u>	L-glutamine D-fructose-6-phosphate amidotransferase	27
<u>csf-1</u>	cell wall autolyzing enzyme	31	<u>preg</u>	phosphatase regulation	16, 20
<u>csf-2</u>	cell wall autolyzing enzyme	31	<u>pro-1</u>	pyrroline-5-carboxylate reductase	Y28
<u>cys-2</u>	sulfite reductase	XL26	<u>pt</u>	chorismic mutase	XE12
<u>cys-3</u>	regulation of sulfur metabolism	XA184, XM100	<u>pyr-1</u>	dihydroorotate dehydrogenase	XC6, XC7
<u>cys-4</u>	sulfite reductase	XA184	<u>pyr-2</u>	orotidine 5'-monophosphate pyrophosphorylase	XC6, XC7
<u>cys-10</u>	sulfite reductase	XA184	<u>pyr-3</u>	carbamoyl phosphate synthase and aspartate carbamyltransferase	XD8
<u>cys-13</u>	sulfur permease I (conidial type)	17, 18	<u>pyr-4</u>	orotidine 5'-monophosphate decarboxylase	XC6, XC7
<u>cys-14</u>	sulfur permease II (mycelial type)	17, 18	<u>pyr-5</u>	dihydroorotate amidohydrolase	XC6, XC7
<u>gal-1</u>	glucose-6-phosphate dehydrogenase	30	<u>pyr-6</u>	urate catabolic pathway regulation	7
<u>gal-2</u>	galactokinase	23	<u>qa-3</u>	dehydroquinase (catalase)	7
	GDPG pyrophosphorylase	21	<u>qa-4</u>	aspartate dehydrogenase	7
			<u>rg-1</u>	dehydroshikimate dehydrase	7
				phosphoglucomutase I	XB117

Gene	Enzyme or Other Function	Reference	Gene	Enzyme or Other Function	Reference
<u>rg-2</u>	phosphoglucomutase II	XM70	<u>trp-3</u>	tryptophan synthetase	B124
<u>scon</u>	regulation of sulfur metabolism	6	<u>trp-4</u>	anthranilate PP-ribose-P-phosphoribosyl-transferase	XD30, XD31
<u>ssu-1</u>	nonsense suppressor	XS31, XC21			23
<u>ssu-2</u>	nonsense suppressor	XS30, XS32	<u>trp-5</u>	tryptophanyl-tRNA synthetase	H124, H113
<u>ssu-3</u>	nonsense suppressor	XS30, XS32	<u>ty-1</u>	tyrosinase regulation	H124, H113,
<u>ssu-4</u>	nonsense suppressor	XS30, XS32	<u>ty-2</u>	tyrosinase regulation	12
<u>ssu-5</u>	nonsense suppressor	SC22			XE12
<u>ssu-6</u>	nonsense suppressor	xc22	<u>tyr-1</u>	prephenic dehydrogenase	XF42
<u>ssu-7</u>	nonsense suppressor	xc21	<u>tyr-2</u>	prephenic dehydrogenase (thermolabile)	XW64
<u>suc</u>	pyruvate carboxylase	S19, 4	<u>uc-1</u>	thymidine salvage pathway regulation	XW64
<u>T</u>	tyrosinore	H113, H114	<u>uc-2</u>	pyrimidine deoxyribonucleosidase	XW64
<u>i 9</u>	glucoamylase	21	<u>uc-4</u>	uracil phosphorylase	26
<u>thr-2</u>	threonine synthetase	F61, T37	<u>ure-1</u>	urease	26
<u>trp-1</u>	anthranilate synthetase, phosphoribosyl- anthranilate isomerase, and indole glycerol phosphate synthetase	XD29, XD31	<u>we-2</u>	urease	10
		XD29, XD30	<u>uvs-3</u>	serine protease (activator of nuclease)	10
<u>trp-2</u>	anthranilate synthetase		<u>uvs-6</u>	serine protease (activator of nuclease)	26
			<u>xdh-1</u>	xanthine dehydrogenase	

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