true or highly likely substrate	method of verification	assay type	reference	doi	fc correct	ss correct	organism	predicted functional class fc	fc prediction probability	predicted substrate specificity ss	ss prediction probability	accession	perc aa identity to closest training set
2,3-dihydroxybenzoate	purified protein in heterologous host	malachite green pyrophosphate assay	Zane et al. (2014) *JACS.* 136(15), 5615-5618	doi: 10.1021/ja5019942.	1	1	*Vibrio campbellii ATCC BAA-1116*	Aryl-CoA liga	0.98	aryl and biary	0.95	ABU70375.1	59.7
proline	biosynthetic logic based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Fu et al. (2019) *ChemBioChem* 20(6), 764-769	doi: 10.1002/cbic.201800791.	1	1	*Streptomyces armeniacus*	Nonribosoma	0.98	cyclic aliphat	0.66	AZY92000.1	64.4
glycine	purified protein from heterologous host, in vitro biochemical assay	fluorogenic pyrophosphate production assay	Shi et al. (2019) *Chemical Science* 10(10), 3042-3048	doi: 10.1039/c8sc05670f	1	1	*Streptomyces lividans SBT19*	Nonribosoma	0.98	tiny	0.42	QCE20608.1	36.2
tyrosine	product abolished after genetic knockout, stable isotope labeling to show tyrosine incorporation	gene deletions	Lin et al. (2019) *Molecules* 24, 2267	doi: 10.3390/molecules24122267	1	1	*Neonectria* sp. DH2	Nonribosoma	0.96	bulky mainly	0.75	BGC0002035|c1|342(	58.1
C12 - C16 (preferred) C10-C18 tested	product purification from native host, MS-based assessment of structural variability of fatty acid moiety	product determination by ultra-high performance liquid chromatography plus (HPLC+)	Mares et al. (2019) *AEM*. 85(4), 17	doi: 10.1128/aem.02675-18	1	1	*Cylindrospermum moravicum CCA*	Fatty-acyl AM	0.91	C13 through	0.72	AXN93578.1	94.1
3-formamidosalicylate	BAC cloning and expression of biosynthetic cluster in heterologous host, biosynthetic logic based on natural product isolation	HPLC-MS analysis of natural product intermediates, sequence-based prediction	Awakawa et al. (2018) *Nat. Comm.* 9, 3534	doi: 10.1038/s41467-018-05877-z.	1	1	*Streptomyces orinoci*	Aryl-CoA liga	0.91	cinnamate ar	0.63	BBD17766.1	79.3
C12 - C16 (preferred) C10-C18 tested	product purification from native host, MS-based assessment of structural variability of fatty acid moiety	product determination by ultra-high performance liquid chromatography plus (HPLC+)	Mares et al. (2019) *AEM*. 85(4), 17	doi: 10.1128/aem.02675-19	1	1	*Anabaena minutissima UTEX B 16*	Fatty-acyl AM	0.91	C13 through	0.44	AXN93595.1	68.7
3-formamidosalicylate	BAC cloning and expression of biosynthetic cluster in heterologous host, biosynthetic logic based on natural product isolation	HPLC-MS analysis of natural product intermediates, sequence-based prediction	Awakawa et al. (2018) *Nat. Comm.* 9, 3534	doi: 10.1038/s41467-018-05877-z.	1	1	*Streptomyces sp.*	Aryl-CoA liga	0.9	cinnamate ar	0.6	BBD17745.1	79.2
C12 - C16 (preferred) C10-C18 tested	product purification from native host, MS-based assessment of structural variability of fatty acid moiety	product determination by ultra-high performance liquid chromatography plus (HPLC+)	Mares et al. (2019) *AEM*. 85(4), 17	doi: 10.1128/aem.02675-20	1	1	*Anabaena sp. UHCC-0399*	Fatty-acyl AM	0.89	C13 through	0.47	AXN93608.1	67.9
glycine, serine, alanine	purified protein from heterologous host, in vitro biochemical assay	fluorogenic pyrophosphate production assay	Shi et al. (2019) *Chemical Science* 10(10), 3042-3048	doi: 10.1039/c8sc05670f	1	0	*Streptomyces lividans SBT20*	Nonribosoma	0.88	cysteine	0.43	QCE20598.1	45.8
N-formyl glycine	biosynthetic logic-based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Bauman et al. (2019) *Cell Chem. Biol.* 26, 724	doi: 10.1038/s41467-018-05877-z.	1	1	*Streptomyces sp. CNB091*	Nonribosoma	0.85	small hydrop	0.3	WP_063738219.1	47.0
decanoic acid	biosynthetic logic-based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Koomsiri et al. (2019) *J. Nat. Prod.* 82(8), 2144-2151	doi: 10.1021/acs.jnatprod.9b00074	1	0	*Streptomyces sp.*	Fatty-acyl AM	0.83	C13 through	0.51	QED55419.1	47.4
(2*Z*,4*E*)-8-methyldeca-2,4-dienoic acid	TAR cloning and expression of biosynthetic cluster in heterologous host, biosynthetic logic	biosynthetic logic sequence-based prediction	Wu et al. (2019) *JACS* 141(9), 3910-3919	doi: 10.1021/jacs.8b12087	1	0	uncultured bacterium metagenome	Fatty-acyl AM	0.83	C13 through	0.43	QBC75017.1	51.8
phenylacetate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14414	1	1	*Streptomyces lividans TK25*	Aryl-CoA liga	0.82	aryl and biary	0.74	EFD64737.1	66.4

C12 - C16 (preferred) C10-C18 tested	product purification from native host, MS-based assessment of structural variability of fatty acid moiety	product determination by ultra-high performance liquid chromatography plus (HPLC+)	Mares et al. (2019) *AEM* 85(4), 17	doi: 10.1128/aem.02675-21	1	1	*Anabaena minutissima UTEX B 16*	Fatty-acyl AM	0.81	C6 through C	0.55	AXN93598.1	67.7
C12 - C16 (preferred) C10-C18 tested	product purification from native host, MS-based assessment of structural variability of fatty acid moiety	product determination by ultra-high performance liquid chromatography plus (HPLC+)	Mares et al. (2019) *AEM* 85(4), 17	doi: 10.1128/aem.02675-22	1	1	*Anabaena sp. UHCC-0399*	Fatty-acyl AM	0.81	C6 through C	0.55	AXN93611.1	66.0
2,3-dihydroxybenzoate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14415	1	1	*Streptomyces lividans TK24*	Aryl-CoA liga	0.79	aryl and biary	0.76	EFD64524.1	54.9
myristoleic acid	biosynthetic logic-based on isolation of natural product and intermediates	biosynthetic logic sequence-based prediction	Moosmann et al. (2018) *Org. Letters* . 20(17), 5238-5241	doi: 10.1021/acs.orglett.8b02193	1	1	*Fischerella sp. PCC 9339*	Fatty-acyl AM	0.78	C13 through	0.49	DAB41914.1	54.4
alanine	purified protein from heterologous host, in vitro biochemical assay	fluorogenic pyrophosphate production assay	Shi et al. (2019) *Chemical Science* 10(10), 3042-3048	doi: 10.1039/c8sc05670f	1	1	*Streptomyces lividans SBT21*	Nonribosoma	0.77	small hydrop	0.3	QCE20609.1	39.8
luciferin	purified protein from heterologous host, structure determination, steady-state kinetics	spectrophotometric assay	Carrasco-Lopez et al. (2018) *Life Sci Alliance* 1(4), e201800072	doi: 10.26508/lsa.201800072	1	1	*Amydetes vivianii*	Luciferase	0.76	luciferin	0.79	6AAA_A	86.4
2-aminobenzoate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14416	1	1	*Streptomyces lividans TK27*	Aryl-CoA liga	0.7	aryl and biary	0.57	EFD66106.1	33.7
4-acetamidopyrrole-2-carboxylate	biosynthetic logic-based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Vingadassalon et al. (2015) *ACS Chem. Biol.* 10(2), 601-610	doi: 10.1021/cb500652n	1	1	*Streptomyces netropsis*	Aryl-CoA liga	0.62	cinnamate ar	0.28	AIS24844.1	31.9
4-coumarate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14417	1	1	*Streptomyces lividans TK28*	Aryl-CoA liga	0.61	cinnamate ar	0.42	EFD67678.1	44.0
octanoate; hexanoate	substrate synthesis and culture feeding experiments, biosynthetic logic	HPLC-MS analysis of natural product intermediates, sequence-based prediction	Rachid et al. (2011) *ChemBioChem* . 12(6), 922-931	doi: 10.1002/cbic.201100024.	1	0	*Streptomyces cinnabarigriseus*	Fatty-acyl AM	0.6	C13 through	0.29	CBW54660.1	61.7
(1-(3-(carboxymethyl)-1,8,9-trihydroxyanthracen-2-yl)-1-hydroxyethyl)-L-serine	biosynthetic logic-based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Panter et al. (2018) *Chemical Science* 9(21), 4898-4908.	doi: 10.1039/c8sc01325j	1	1	*Pyxidicoccus fallax*	Aryl-CoA liga	0.58	cinnamate ar	0.3	AXM42922.1	36.2
3-oxo-3,4-dihydro-2*H*-benzo[*b*][1,4]oxazine-2,5-dicarboxylic acid	purified protein from heterologous host, in vitro biochemical assay	fluorogenic pyrophosphate production assay	Shi et al. (2019) *Chemical Science*. 10(10), 3042-3048	doi: 10.1039/c8sc05670f	1	1	*Streptomyces sp.*	Aryl-CoA liga	0.56	aryl and biary	0.34	QCE20613.1	48.4
3-methylmercaptopropionate; also active with short chain fatty acids up to C6	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Bullock et al. (2014) *J. Biol. Chem.* 196, 1275-1285	doi: 10.1016/j.chembiol.2019.02.004	0	0	*Ruegeria pomeroyi*	Aryl-CoA liga	0.47	cinnamate ar	0.23	WP_011047771.1	44.5
5-hydroxy-6-methoxy-1*H*-indole-2-carboxylic acid	biosynthetic logic based on gene knockouts, protein purification of other biosynthetic enzymes, and isolation of natural products and intermediates	biosynthetic logic sequence-based prediction	Huang et al. (2012) *JACS* 64(1),163–166	doi: 10.1038/ja.2010.150	1	1	*Streptomyces sp. TP-A2060*	Aryl-CoA liga	0.46	cinnamate ar	0.27	ADZ13551.1	35.3
benzoxazolinate	purified protein from heterologous host, in vitro biochemical assay	fluorogenic pyrophosphate production assay	Shi et al. (2019) *Chemical Science*. 10(10), 3042-3048	doi: 10.1039/c8sc05670f	1	1	*Streptomyces lividans SBT18*	Aryl-CoA liga	0.46	aryl and biary	0.23	QCE20614.1	34.5

3-dimethylallyl-4-hydroxybenzoic acid	purified protein in heterologous host	radioactive ATP-pyrophosphate exchange assay	Steffensky et al. (2000) *JBC* . 275(28), 21754-21760	doi: 10.1074/jbc.M003066200	1	1	*Streptomyces niveus*	Aryl-CoA liga	0.46	cinnamate ar	0.22	AAF67505.1	35.3
1-carboxy-2-cyanopropane	biosynthetic logic-based on gene knockouts and natural product isolation	biosynthetic logic sequence-based prediction	Wang et al. (2017) *ACS Chem. Biol.* 12, 3067−3075	doi: 10.1021/cb500652n	0	0	*Streptomyces thioluteus*	Long chain a	0.45	C13 through	0.55	ATY72527.1	58.6
(2*S*,3*R*)-2-hydroxy-3-(1*H*-indol-3-yl)butanoic acid	purified protein from heterologous host, in vitro biochemical assays	HPLC/LC-MS analysis	Du et al. (2015) *PNAS.* 112(9), 2717-2722	doi: 10.1073/pnas.1419964112	1	1	*Streptomyces griseus*	Aryl-CoA liga	0.45	aryl and biary	0.23	AJT38684.1	31.2
3-methylmercaptopropionate	purified protein from heterologous host, structure determination, steady-state kinetics	HPLC analysis	Shao et al. (2019) *Mol. Microbiol.* 111(4), 1057–1073.	doi: 10.1002/cbic.201100024.	0	0	*Ruegeria lacuscaerulensis ITI-115*	Aryl-CoA liga	0.44	cinnamate ar	0.24	6IJB_A	44.1
caproate, valerate, heptanoate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14418	0	0	*Streptomyces lividans TK29*	Aryl-CoA liga	0.37	C13 through	0.25	EFD68037.1	54.0
3-hydroxypropionate	purified protein from heterologous host, structure determination, steady-state kinetics	NADH-consumption continuous spectrophotometric assay	Bernhardsgrütter et al. (2018) *Nat. Chem. Biol.* 14(12), 1127-1132	doi: 10.1021/ja5019942.	1	1	*Erthythrobacter* sp. *NAP1*	Short chain a	0.36	C2 through C	0.24	6EQO_A	27.4
2-hydroxyisobutyric acid	purified protein from heterologous host, structure determination, steady-state kinetics	HPLC analysis	Zahn et al. (2019) *J Mol. Biol.* 431(15), 2747–2761	doi: 10.1016/j.jmb.2019.05.027	0	0	*Aquincola tertiaricarbonis*	Aryl-CoA liga	0.36	cinnamate ar	0.17	6HDW_A	34.0
myristate	biosynthetic logic based on gene knockouts, protein purification of other biosynthetic enzymes, and isolation of natural products and intermediates	biosynthetic logic sequence-based prediction	Duitman et al. (1999) *PNAS.* 96(23), 13294–13299	doi: 10.1073/pnas.96.23.13294	0	1	*Bacillus subtilis subsp. spizizenii A*	Aryl-CoA liga	0.32	C13 through	0.15	AAF08801.1	92.9
valerate, butyrate, caproate	purified protein from heterologous host	NADH-consumption continuous spectrophotometric assay	Burckhardt et al. (2020) *Mol. Microbiol.* 113, 253-269	doi: 10.1111/mmi.14419	0	0	*Streptomyces lividans TK26*	Aryl-CoA liga	0.31	C13 through	0.21	EFD64965.1	39.1
3-amino-2-hydroxy-4-methoxybenzoic acid	crude lysate assays, in vitro biochemical assays on partially purified protein	LC-MS-based analysis	Waldman et al. (2018) *J. Org Chem.* 83(14), 7539-46	doi: 10.1021/acs.joc.8b00367	1	0	*Streptomyces cremeus*	Aryl-CoA liga	0.29	C13 through	0.18	ALA99210.1	43.3
1-acetyl-9*H*-pyrido[3,4-*b*]indole-3-carboxylic acid	purified protein from heterologous host, structure determination	HPLC analysis with substrate panel	Petchey et al. (2018) *Angew. Chem. Int. Ed.*	doi: 10.1002/anie.201804592	1	1	*Marinactinospora thermotolerans*	Aryl-CoA liga	0.26	cinnamate ar	0.16	6H1B_A	33.2
				Average	0.83	0.73						**Average**	52.5