

S2 Table. Substrate specificity of characterised GH29 α -L-fucosidases. Abbreviations used as well as relevant references are listed below. The table is adapted from http://www.cazy.org/GH29_characterized.html.

Organism	Protein Name	EC#	GenBank	Uniprot	Reported substrates hydrolyzed	Reported substrates not hydrolyzed
<i>Sulfolobus solfataricus</i> P2	α -L-fucosidase (FucA1;SSO11867 + SSO3060)	3.2.1.51	AAK43159.1 AAK43160.1	Q97UG1 Q97UG2	pNP-Fuc, α -L-Fuc-(1-3)- α -L-Fuc-O-4-NP [1]	<i>NA</i>
<i>Bacteroides thetaiotaomicron</i> VPI-5482	α -1,3/1,4-L-fucosidase / α -galactosidase (BT2192;BT_2192)	3.2.1.111	AAO77299.1	Q8A5P6	3-FL, Le ^a , Le ^b , Le ^x , Le ^y , [2]	pNP-Fuc (very low), 2-FL (very low), Fuca1-3GlcNAc, Fuca1-4GlcNAc, Fuca1-6GlcNAc [2]
<i>Bacteroides thetaiotaomicron</i> VPI-5482	α -L-fucosidase (Fuc2970;BtFuc2970;BT2970;BT_2970)	3.2.1.51	AAO78076.1 NP_811882.1	Q8A3I4	pNP-Fuc, Fuca1-3GlcNAc, Fuca1-4GlcNAc (low) [2]	Fuca1-6GlcNAc, 2'FL, 3-FL, Le ^a , Le ^b , Le ^x , Le ^y [2]
<i>Bifidobacterium bifidum</i> JCM 1254	α -1,3/4-L-fucosidase (AfcB;BbAfcB)	3.2.1.111	BAH80310.1	C5NS94	3FL, Le ^a , Le ^b , Le ^x , Le ^y , LNFP II, LNFP III [3]	2'-FL, Fuca1-6GlcNAc, Sle ^x (trace), pNP-Fuc [3]
<i>Bifidobacterium longum</i> subsp. <i>infantis</i> ATCC 15697	α -1,3/1,4-L-fucosidase (Blon_2336)	3.2.1.51 3.2.1.111	ACJ53394.1	B7GNN8	CNP-fucose, 3'FL, LNFP III, Le ^a , Le ^x , partially LNFP I [4]	2'-FL, Fuca1-2Gal [4]
<i>Bifidobacterium longum</i> subsp. <i>infantis</i> ATCC 15697	α -L-fucosidase (Blon_0248)	3.2.1.51	ACJ51376.1	B7GTT5	CNP-fucose, LNFP III, partially LNFP I [4]	2'-FL, 3-FL, Fuca1-2Gal [4]
<i>Bifidobacterium longum</i> subsp. <i>infantis</i> ATCC 15697	α -L-fucosidase (Blon_0426)	3.2.1.51	ACJ51546.1	B7GN40	CNP-fucose, LNFP III, partially LNFP I [4]	2'-FL, 3-FL, Fuca1-2Gal [4]
<i>Lactobacillus casei</i> BL23	α -L-fucosidase A (AlfA;LCABL_20390) (probable fragment)	3.2.1.51	CAQ67115.1	B3W8U6	pNP-Fuc, Fuca1-6GlcNAc (low) [5]	Fuca1-2Gal, Fuca1-2Gal β 1-4GlcNAc, Fuca1-2Glc, Le ^x , Le ^a , Le ^b , Fuca1-3GlcNAc, Fuca1-4GlcNAc [5]
<i>Lactobacillus casei</i> BL23	α -L-fucosidase B (AlfB;LCABL_28270)	3.2.1.51	CAQ67877.1	B3WB08	pNP-Fuc, Fuca1-3GlcNAc (high), Fuca1-2Gal, Fuca1-2Gal β 1-4GlcNAc, 2'-FL, Fuca1-4GlcNAc [5]	3-FL, Le ^x , Le ^a , Le ^b , Fuca1-6GlcNAc [5]
<i>Lactobacillus casei</i> BL23	α -L-fucosidase C (AlfC;LCABL_29340) (possible fragment)	3.2.1.51	CAQ67984.1	B3WB55	pNP-Fuc, Fuca1-6GlcNAc (high), Fuca1-2Gal (low), Fuca1-3GlcNAc (low), Fuca1-4GlcNAc (low) [5]	Fuca1-2Gal β 1-4GlcNAc, 2'FL, 3-FL, Le ^x , Le ^a , Le ^b [5]

<i>Paenibacillus thiaminolyticus</i>	α -L-fucosidase (aLfk1)	3.2.1.51	CBM40947.1	E3PQQ9	pNP-fuc [6]	NA
<i>Streptomyces</i> sp. 142	α -1,3/1,4-L-fucosidase (N/A)	3.2.1.111	AAD10477.1	Q9Z4I9	<u>Oligosaccharides labeled with 2-amionpyridine:</u> LNFPII-PA, LNFPIII-PA, Fuca α 1-2LNFPII-PA	<u>Oligosaccharides labeled with 2-amionpyridine</u> sialylated-LNFPII-PA (very low), 2'-FL-PA (very low), LNFPI-PA, ...
<i>Tannerella forsythia</i> ATCC 43037	α -1,2-L-fucosidase (Fuc1;TfFuc1;BFO_2737)	3.2.1.63	AEW21393.1	G8UMQ6	pNP-fuc, 2'FL H-trisaccharide, Fuca α 1-6GlcNAc [7]	3-FL, Le ^a , A antigen tetraose, Fuc(α 1-4)Gal [7]
<i>Thermotoga maritima</i> MSB8	α -L-fucosidase (TM0306)	3.2.1.51	AAD35394.1	Q9WYE2	pNP-fuc [8]	NA
<i>Xanthomonas campestris</i> pv. <i>campestris</i> ATCC 33913	[N-glycan] α -1,3-L-fucosidase (NixE;FucA1;XCC2888)	3.2.1.51	AAM42160.1	Q8P6S7	AMC (7-amino-4-methylcoumarin) substrates: LNFPII-AMC, LNFPIII-AMC [9]	AMC (7-amino-4-methylcoumarin) substrates: 2'-FL-AMC [9]
<i>Arabidopsis thaliana</i>	α -1,3/4-L-fucosidase 1 (AtFUC1;At2g28100)	3.2.1.111	NP_180377.2	Q8GW72 Q9ZUV2	2-aminobenzamide labeled LNFP II, 3FL, fucose linked α 1-4 to non-reducing end in higher DP oligoes [10]	2-aminobenzamide labeled 2'-FL, pNP-Fuc, fucose linked α 1-3 to reducing end [10]
<i>Canis lupus familiaris</i>	α -L-fucosidase (FUCA1)	3.2.1.51	CAA63362.1	P48300	4-methylumbelliferyl- α -L-fucopyranoside [11]	NA
<i>Dictyostelium discoideum</i>	α -L-fucosidase (AlfA)	3.2.1.51	AAO51149.1	P10901	6-O-alpha-L-fucopyranosyl-N-acetylglucosaminitol, low activity on 2'-fucosyllactitol, very low on 3-fucosyllactitol and Lacto-N-fucopentaitol I [12]	Lacto-N-fucopentaitol II, Lacto-N-fucopentaitol III [12]
<i>Drosophila melanogaster</i>	α -L-fucosidase (Fuca;DmFuca;CG6128)	3.2.1.51	AAM50292.1	Q9VTJ4	NA	NA
<i>Fusarium graminearum</i> PH-1	α -L-fucosidase (Fco1;FgFCO1;fg11254)	3.2.1.51	AFR68935.1	J9UN47	pea XG oligosaccharides (Fuca α 1-2Gal β 1-2Xyl in XXFG) [13], 2'-FL, Fuca α 1-2Gal (low) [14]	pNP-Fuc (very weak), 3-FL, Le ^a , Le ^x (very weak) [14]

<i>Fusarium oxysporum</i> 0685	α -L-fucosidase (Fco1;FoFCO1)	3.2.1.51	AFR68934.1	J9TMS7	pNP-Fuc [13], fucoidan, porcine gastrin mucin [15]	NA
<i>Homo sapiens</i>	α -L-fucosidase (FucA1)	3.2.1.51	AAA52481.1	P04066 Q8NAC2	4-methylumbelliferyl α -L-fucopyranoside, pNP-Fuc, 2'-FL, LNFPII, LNFPIII, α 1-2Fuc-decasaccharide, Fuca1-6GlcNAc, α -L-fucose residues linked to the 2 position of galactose or the 3, 4, or 6 position of N-acetylglucosamine [16]	4-methylumbelliferyl β -fucopyranoside, 4-methylumbelliferyl α -galactopyranoside, pNP- β -Fuc [16]
<i>Homo sapiens</i>	α -L-fucosidase (FucA2;Mgc1314;dJ20N2.5)	3.2.1.51	CAB53746.1	Q7Z6V2 Q9BTY2	Hydrolyzes pNP-Fuc, prefers α 1-2 but capable of cleaving some α 1-3, and α 1-4 linkages [17]	NA
<i>Rattus norvegicus</i>	α -L-fucosidase (FucA1;FucA)	3.2.1.51	CAA34268.1	P17164	Hydrolyzes pNP-Fuc, α 1-2, α 1-3, and α 1-4 fucosyl linkages, and glycopeptides derived from β -glucuronidase but not native glycopeptides, lower activity on α 1-6 linkages [18]	Fuca1-2GlcNAc β -pNP

Abbreviations used:

2'FL	Fuca1-2Gal β 1-4Glc
3-FL	Gal β 1-4(Fuca1-3)Glc
A antigen tetraose	GalNAc β 1-3(α Fuc1-2)Gal β 1-4Glc
Antigen H disaccharide	Fuca1-2Gal β
Antigen H type II trisaccharide	Fuca1-2Gal β 1-4GlcNAc
CNP-Fucose	2-chloro-4-nitrophenyl- α -L-fucopyranoside
Le ^a trisaccharide	Gal β 1-3(Fuca1-4)GlcNAc
Le ^b trisaccharide	Fuca1-2Gal β 1-3(Fuca1-4)GlcNAc
Le ^x trisaccharide	Gal β 1-3(Fuca1-3)GlcNAc
Le ^y trisaccharide	Fuca1-2Gal β 1-3(Fuca1-3)GlcNAc
LNFP I	Fuca1-2Gal β 1-3GlcNAc β 1-3Gal β 1-4Glc
LNFP II	Gal β 1-3(Fuca1-4)GlcNAc β 1-3Gal β 1-4Glc
LNFP III	Gal β 1-3(Fuca1-3)GlcNAc β 1-3Gal β 1-4Glc
LNFP V	Gal β 1-3GlcNAc β 1-3Gal β 1-4(Fuca1-3)Glc
pNP-Fuc	4-Nitrophenyl α -L-fucopyranoside

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