

Supplementary Table S3. Phylogenetic profiles of glycosyltransferases among ascidians. A total of 35 GTs being lost either in each ascidian or in both ascidians were listed in the table. In the right columns, proteins homologous to the human GTs and functionally-linked glycan synthetic enzymes in the genomes of ascidians were coded as 1 (present) or 0 (absent). Other 138 GTs, which were present in both ascidians, were omitted in this table. GTs being lost in both ascidians comprised mainly Class 1 GTs

Human Glycosyltransferases							Ascidians' phylogenetic profile	
	UniProt ID	Gene Names	Protein Names	Categories of Glycan	Localization	CAZy	<i>Ciona intestinalis</i>	<i>Ciona savignyi</i>
Class 1	Q8N5D6	GBGT1	Globoside α -1,3- <i>N</i> -acetylgalactosaminyltransferase 1	Glycosphingolipid	Golgi apparatus	GT6	0	0
	P16442	ABO	Histo-blood group ABO system transferase	Glycosphingolipid	Golgi apparatus	GT6	0	0
	P19526	FUT1	Galactoside 2- α -L-fucosyltransferase 1	Glycosphingolipid	Golgi apparatus	GT11	0	0
	Q10981	FUT2	Galactoside 2- α -L-fucosyltransferase 2	Glycosphingolipid	Golgi apparatus	GT11	0	0
	Q00973	B4GALNT1	β -1,4 <i>N</i> -acetylgalactosaminyltransferase 1	Glycosphingolipid	Golgi apparatus	GT12	0	0
	Q8NHY0	B4GALNT2	β -1,4 <i>N</i> -acetylgalactosaminyltransferase 2	<i>O</i> -Glycan, <i>N</i> -Glycan, Glycosphingolipid	Golgi apparatus	GT12	0	0
	Q09327	MGAT3	β -1,4-mannosyl-glycoprotein 4- β - <i>N</i> -acetylglucosaminyltransferase	<i>N</i> -Glycan	Golgi apparatus	GT17	0	0
	Q92186	ST8SIA2	α -2,8-sialyltransferase 8B (SIAT8-B) (ST8SiaII) (STX)	<i>N</i> -Glycan	Golgi apparatus	GT29	0	1
	O15466	ST8SIA5	α -2,8-sialyltransferase 8E (SIAT8-E) (ST8SiaV)	Glycosphingolipid	Golgi apparatus	GT29	0	1
	Q8NDV1	ST6GALNAC3	α - <i>N</i> -acetylgalactosaminide α -2,6-sialyltransferase 3 (ST6GalNAcIII) (SIAT7-C)	Glycosphingolipid	Golgi apparatus	GT29	0	0
	Q9BVH7	ST6GALNAC5	α - <i>N</i> -acetylgalactosaminide α -2,6-sialyltransferase 5 (ST6GalNAcV) (SIAT7-E)	Glycosphingolipid	Golgi apparatus	GT29	0	0
	Q969X2	ST6GALNAC6	α - <i>N</i> -acetylgalactosaminide α -2,6-sialyltransferase 6 (ST6GalNAcVI) (SIAT7-F)	Glycosphingolipid	Golgi apparatus	GT29	0	0
	Q92185	ST8SIA1	α - <i>N</i> -acetylneuraminide α -2,8-sialyltransferase (Ganglioside GD3 synthase) (SIAT8-A)	Glycosphingolipid	Golgi apparatus	GT29	0	0
	Q9H4F1	ST6GALNAC4	α - <i>N</i> -acetylneuraminyl-2,3- β -galactosyl-1,3- <i>N</i> -acetyl-galactosaminide α -2,6-sialyltransferase (ST6GalNAcIV) (SIAT3-C) (SIAT7-D)	Glycosphingolipid	Golgi apparatus	GT29	0	0
	P15907	ST6GAL1	β -galactoside α -2,6-sialyltransferase 1 (ST6GalI)	<i>O</i> -Glycan, <i>N</i> -Glycan	Golgi apparatus	GT29	0	0
	Q92187	ST8SIA4	CMP- <i>N</i> -acetylneuraminyl-poly- α -2,8-sialyltransferase (SIAT8-D) (ST8SiaIV)	<i>N</i> -Glycan	Golgi apparatus	GT29	0	1
	Q9UNA3	A4GNT	α -1,4- <i>N</i> -acetylglucosaminyltransferase	<i>O</i> -Glycan	Golgi apparatus	GT32	0	0
	Q9NPC4	A4GALT	Lactosylceramide 4- α -galactosyltransferase	Glycosphingolipid	Golgi apparatus	GT32	0	0
	Q8NAT1	POMGNT2	Glycosyltransferase-like domain-containing protein 2	<i>O</i> -Glycan	Extracellular	GT61	0	0
	O94777	DPM2	Dolichol phosphate-mannose biosynthesis regulatory protein	<i>N</i> -Glycan, GPI	Endoplasmic	-	0	0
	Q9P2X0	DPM3	Dolichol-phosphate mannosyltransferase subunit 3	<i>N</i> -Glycan	Endoplasmic	-	0	0
	P0C6T2	OST4	Dolichyl-diphosphooligosaccharide—protein glycosyltransferase subunit 4	<i>N</i> -Glycan	Endoplasmic	-	1	0
	Q3MUY2	PIGY	Phosphatidylinositol <i>N</i> -acetylglucosaminyltransferase subunit Y	GPI anchor	Endoplasmic	-	0	0
Q8TBF5	PIGX	Phosphatidylinositol-glycan biosynthesis class X protein	GPI anchor	Endoplasmic	-	0	0	
Q14442	PIGH	Phosphatidylinositol <i>N</i> -acetylglucosaminyltransferase subunit H	GPI anchor	reticulum, Cytoplasm, Mitochondria,	-	0	0	
Class 2	Q16880	UGT8	2-hydroxyacylsphingosine 1- β -galactosyltransferase	Glycosphingolipid	-	GT1	0	0
	Q10469	MGAT2	α -1,6-mannosyl-glycoprotein 2- β - <i>N</i> -acetylglucosaminyltransferase	<i>N</i> -Glycan	Golgi apparatus	GT16	1	0
	Q96L58	B3GALT6	β -1,3-galactosyltransferase 6	Proteoglycan	Golgi apparatus	GT31	0	1
	Q96EU7	C1GALT1C1	C1GALT1-specific chaperone 1	<i>O</i> -Glycan	Golgi apparatus	GT31	0	1
Class 3	Q86VD9	PIGZ	GPI mannosyltransferase 4	GPI anchor	Endoplasmic	GT22	0	1
	Q9BT22	ALG1	Chitobiosyldiphosphodolichol b-mannosyltransferase	<i>N</i> -Glycan	Endoplasmic	GT33	1	0
	Q9H3S5	PIGM	GPI mannosyltransferase 1	GPI anchor	Endoplasmic	GT50	0	1
	Q92535	PIGC	Phosphatidylinositol <i>N</i> -acetylglucosaminyltransferase subunit C	GPI anchor	Endoplasmic	-	0	1
	P57054	PIGP	Phosphatidylinositol <i>N</i> -acetylglucosaminyltransferase subunit P	GPI anchor	Endoplasmic	-	1	0
	Q9BRB3	PIGQ	Phosphatidylinositol <i>N</i> -acetylglucosaminyltransferase subunit Q	GPI anchor	Endoplasmic	-	1	0