SUPPLEMENTAL MATERIAL

Contents:

Supplemental Table S1: Acceptor list *

Enzyme activity measured	Acceptors used
***Galactosyltransferase (5mM)*:**	
β1,3GalT	GalNAcα-PABA GalNAcα-sp-biotin
β1,4GalT	Galβ1,3(GlcNAcβ1,6)GalNAcα-sp-biotin Galβ1,3(GlcNAcβ1,6)GalNAcα-O-Bn
β1,3/4GalT	GlcNAcβ1,6GalNAcα-sp-biotin
***Sialyltransferase (0.6mM)*:**	
ST3/6[Galβ1,3GalNAc]	Galβ1,3GalNAcα-sp-biotin Galβ1,3GalNAcα-PABA
ST3[Galβ1,3GalNAc]	Galβ1,3(GlcNAcβ1,6)GalNAcα-O-Bn
ST3/6[Galβ1,4GlcNAc]	Galβ1,4GlcNAcβ-sp-biotin Galβ1,4GlcNAcβ1,3Galβ1,4GlcNAcβ-O-Bn Galβ1,4GlcNAcβ1,3Galβ-Φ-NO_2
ST3/6[Galβ1,3GlcNAc]	Galβ1,3GlcNAcβ1,3lacβ-Φ-NO_2
***Fucosyltransferase (1.5mM) ***:**	
α1,3FT[Galβ1,4GlcNAc]	Galβ1,4GlcNAcβ1,3Galβ-Φ-NO_2 Galβ1,4GlcNAcβ1,3Galβ1,4GlcNAcβ-O-Bn
α1,4FT[Galβ1,3GlcNAc]	Galβ1,3GlcNAcβ1,3lacβ-Φ-NO_2
α1,3FT[SialylLacNAc]	Neu5Acα2,3Galβ1,4GlcNAcβ-PAA-biotin

* Table lists enzyme activities measured in the current study along with a list of synthetic acceptors used. Concentration of acceptor in individual assays is indicated. These were greater than reaction K_M in all cases. When more than one product may form during a reaction, multiple enzyme activities measured or types of potential glycosidic bonds formed are specified in the left column.

** α1,2FT activity is low in breast cancer cell lines and thus enzyme activity for LacNAc based acceptors is attributed to either α1,3FT or α1,4FT alone.

Supplemental Table S2: Enzymes activity in breast cancer cells

	ZR-75-1 (metastatic ER+ ductal carcinoma)	**MCF7** (metastatic ER+ ductal adenocarcinoma)	**T-47D** (metastatic ER+ ductal carcinoma)	**DU4475** (non-metastatic triple negative carcinoma)
Cell type	Luminal	Luminal	Luminal	Basal
β1,3GalT	+	-	++	++
β1,4GalT	-	-	-	-
ST3[Galβ1,3GalNAc]	+++	+++	++	+
ST3/6[Galβ1,4GlcNAc]	+	-	+	-
α1,3FT[Galβ1,4GlcNAc]	+	+	+	+
α1,3FT [SialylLacNAc]	+	+	-	-
α1,4FT[Galβ1,3GlcNAc]	++	+	+	+

"-": Enzyme activity comparable to negative control, "+": 2-10 times negative control, "++": 10-30 times negative control, "+++" >30 times negative control.

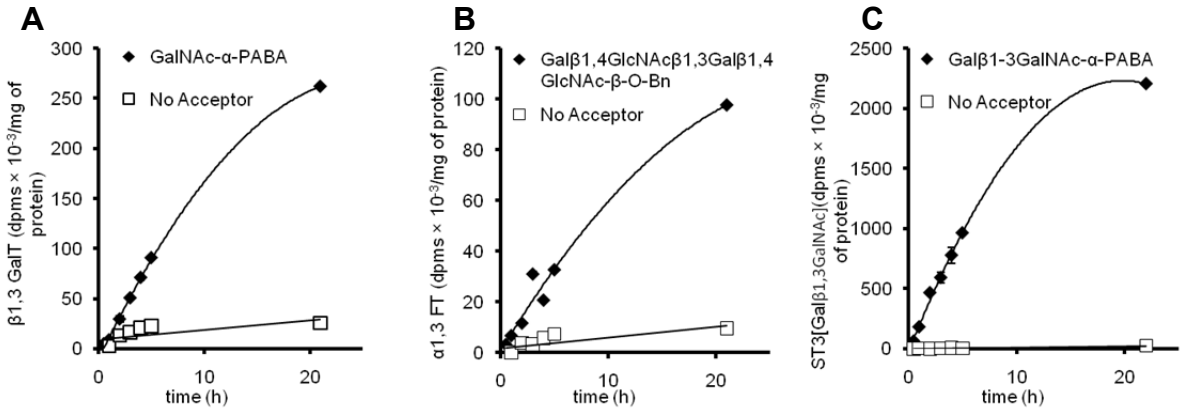

Figure S1: Time course of glycosyltransferase activity in cancer cell line: 1mg/mL ZR-75-1 cell lysate was used as catalyst for β1,3GalT (panel A), α1,3FucT (panel B) and α2,3SialylT (panel C) assays. Reaction conditions were identical to Fig. 2-3 in the main manuscript. In this case, samples withdrawn at indicated times were analyzed using RP-TLC. As seen, the extent of enzymatic reactions proceeds approximately linearly during the first 6h for all assays.

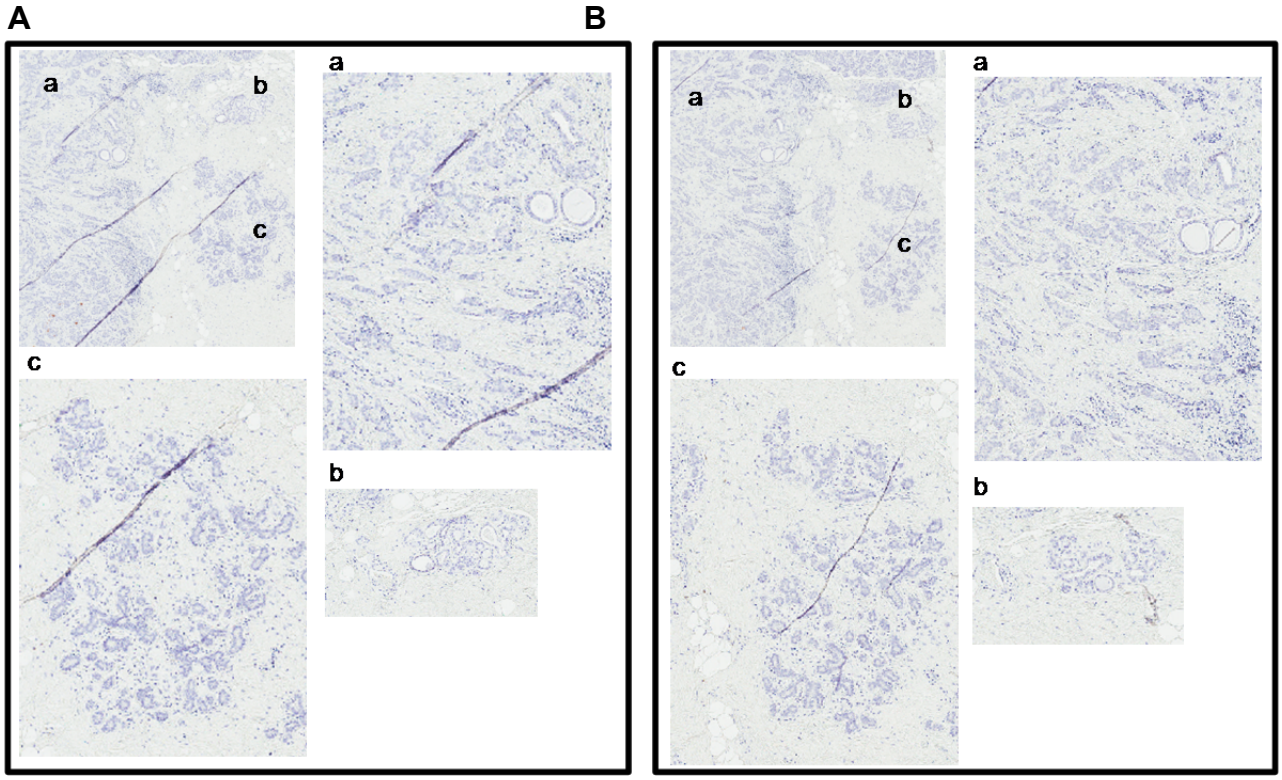

Figure S2: Histochemistry images without sialidase. ***A***. Staining with anti T-antigen antibody for breast tumor section with adjacent normal. The section is labeled as a. Tumor section b. Ductal region in normal section c. Lobular section in normal section. ***B***. Staining with PNA lectin for breast tumor section with adjacent normal. The section is labeled identical to panel ***A*.**

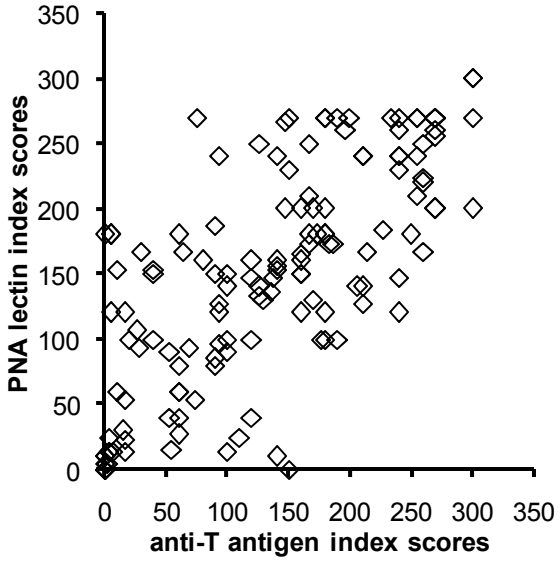

Figure S3: Correlation between PNA lectin and anti T-antigen mAb staining in breast TMA after neuraminidase treatment: Pearson correlation score = 0.725.

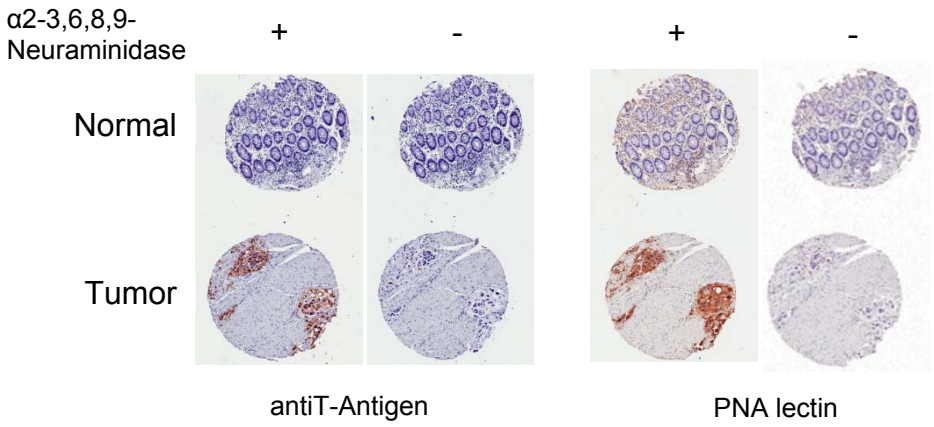

Figure S4: Specific case of matched colon tumor and normal sample. Images of matched normal and tumor section of colon cancer patient stained with anti T-antigen and PNA lectin, after treatment with ('+') or without ('-') neuraminidase.

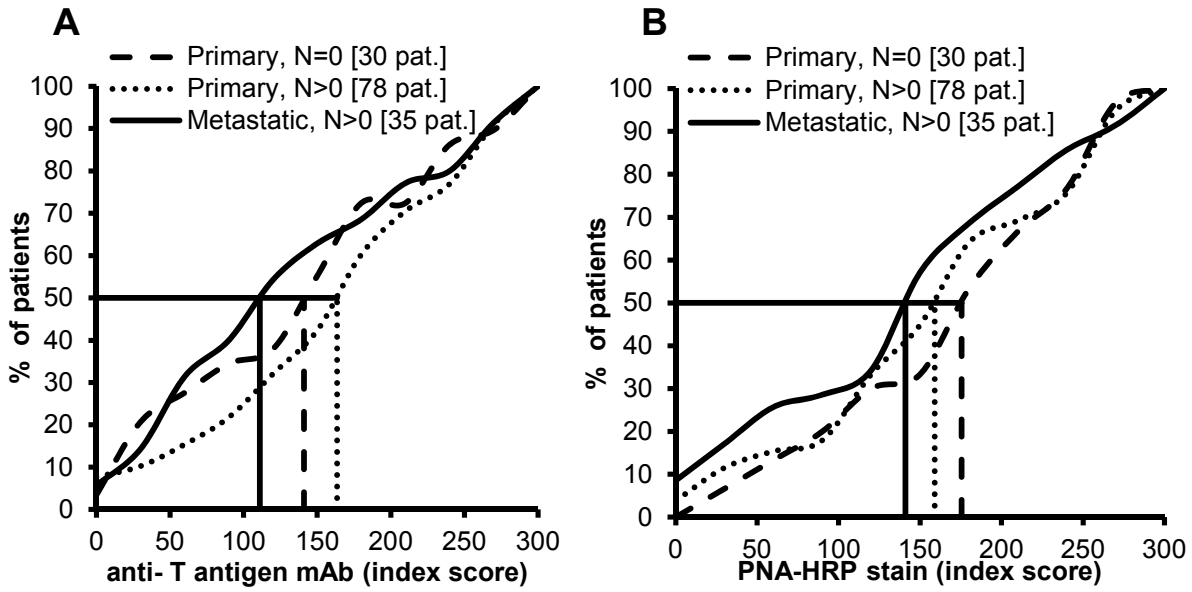

Figure S5: Correlation of amount of staining with metastatic stage. ***A***. Plot showing variation of distribution of number of patients in the 3 different groups viz. non-metastatic (Primary, N=0), primary metastatic tumor (Primary, N>0), metastasized tumor (Metastatic, N>0) with anti-T antigen staining (panel **A**) and PNA-HRP staining (panel **B**). Number of patients in each category is provided in square brackets. As seen, metastasized tumors have less staining of both anti-T-antigen mAb and PNA-HRP.