

Supporting Information

Lectin Microarray-based Sero-Biomarker Verification Targeting Aberrant O-linked Glycosylation on Mucin 1

Atsushi Matsuda,¹ Atsushi Kuno,¹ Tomomi Nakagawa,¹ Yuzuru Ikehara,¹ Tatsuro Irimura,² Masakazu Yamamoto,³ Yasuni Nakanuma,⁴ Eiji Miyoshi,⁵ Shoji Nakamori,⁶ Hayao Nakanishi,⁷ Chutiwan Viwatthanasittiphong,⁸ Petcharin Srivatanakul,⁹ Masanao Miwa,¹⁰ Junichi Shoda,¹¹ Hisashi Narimatsu^{1*}

¹Research Center for Medical Glycoscience (RCMG), National Institute of Advanced Industrial Science and Technology (AIST), ²Juntendo University School of Medicine, ³Department of Surgery, Institute of Gastroenterology, Tokyo Women's Medical University, ⁴Department of Human Pathology, Graduate School of Medical Sciences, Kanazawa University, ⁵Department of Molecular Biochemistry and Clinical Investigation, Osaka University Graduate School of Medicine, ⁶National Hospital Organization Osaka National Hospital, ⁷Division of Oncological Pathology, Aichi Cancer Center Research Institute, ⁸Ubon Cancer Center of Thailand, ⁹National Cancer Institute of Thailand, ¹⁰Faculty of Bioscience, Nagahama Institute of Bio-Science and Technology, ¹¹Field of Basic Sports Medicine, Graduate School of Comprehensive Human Sciences, University of Tsukuba.

* Corresponding author: Hisashi Narimatsu, MD & PhD

Supporting Information

Figure S1. Glycan profiling of normal serum sialylated MUC1 with MY.1E12-overlay lectin microarray.

Figure S2. Dot plots of 36 lectins in CC, hepatolithiasis patients, and NC after MPA-normalization

Figure S3. Combinational analysis of WFA and WGA.

Figure S4. Comparative analysis among WFA-MY.1E12 ELISA, CA19-9, and total-bilirubin with ROC curve analysis in cohort 1.

Figure S5. Serum level of WFA-sialylated MUC1 in patients with CC, hepatolithiasis, and NC in cohort 2.

Figure S6. Linear responsibility and reproducibility of WFA-MY.1E12 sandwich ELISA .

Figure S7. Correlation of WFA-sialylated MUC1 and other clinical indicators (CA19-9 and total bilirubin) in CC patients.

Table S1. Abbreviations and carbohydrate binding specificities of 43 lectins in the lectin microarray.

Table S2. Comparison of glycan profiling methods on MUC1.

Table S3. Comparative lectin profiling of sialylated MUC1 between CC and hepatolithiasis patients in cohort 2.

Table S4. Statistical analysis of all lectins in CC, hepatolithiasis, and normal controls in cohort 2.

Table S5. Comparison of WFA-sialylated MUC1 and other markers in plasma from *O. viverrini*-positive CC and opisthorchiasis patients in cohort 1.

Table S6. Comparison of WFA-sialylated MUC1 and other markers in serum from CC and hepatolithiasis patients in cohort 2.

Table S7. Measured values of WFA-MY.1E12 ELISA and CA19-9 in 78 CC patients in Thailand (cohort 1).

Table S8. Measured values of WFA-MY.1E12 ELISA and CA19-9 in 33 CC patients in Japan (cohort 2).

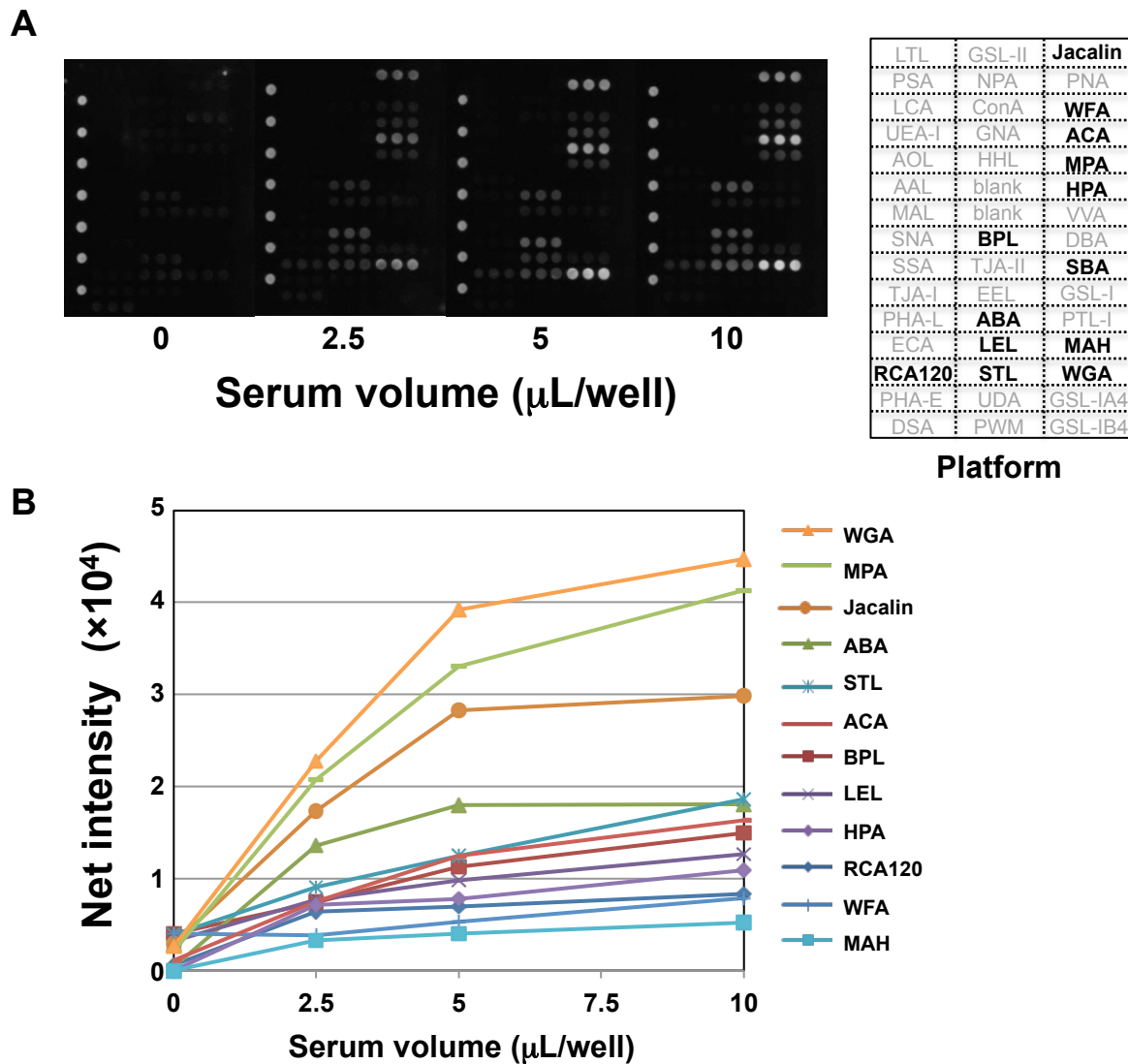


Figure S1. Glycan profiling of NC serum sialylated MUC1 with MY.1E12-overlay lectin microarray.

(A) Left, scan images of glycan profiling with MY.1E12-overlay lectin microarray of sialylated MUC1 0 (control), 2.5, 5, 10 μL of serum from normal control (NC). Right, platform of immobilized 43 lectins on the lectin array slide. Lectins showing significant intensity are indicated in bold. (B) Signal intensities of 13 lectins binding showing the significant signal intensities to serum sialylated MUC1 from NC.

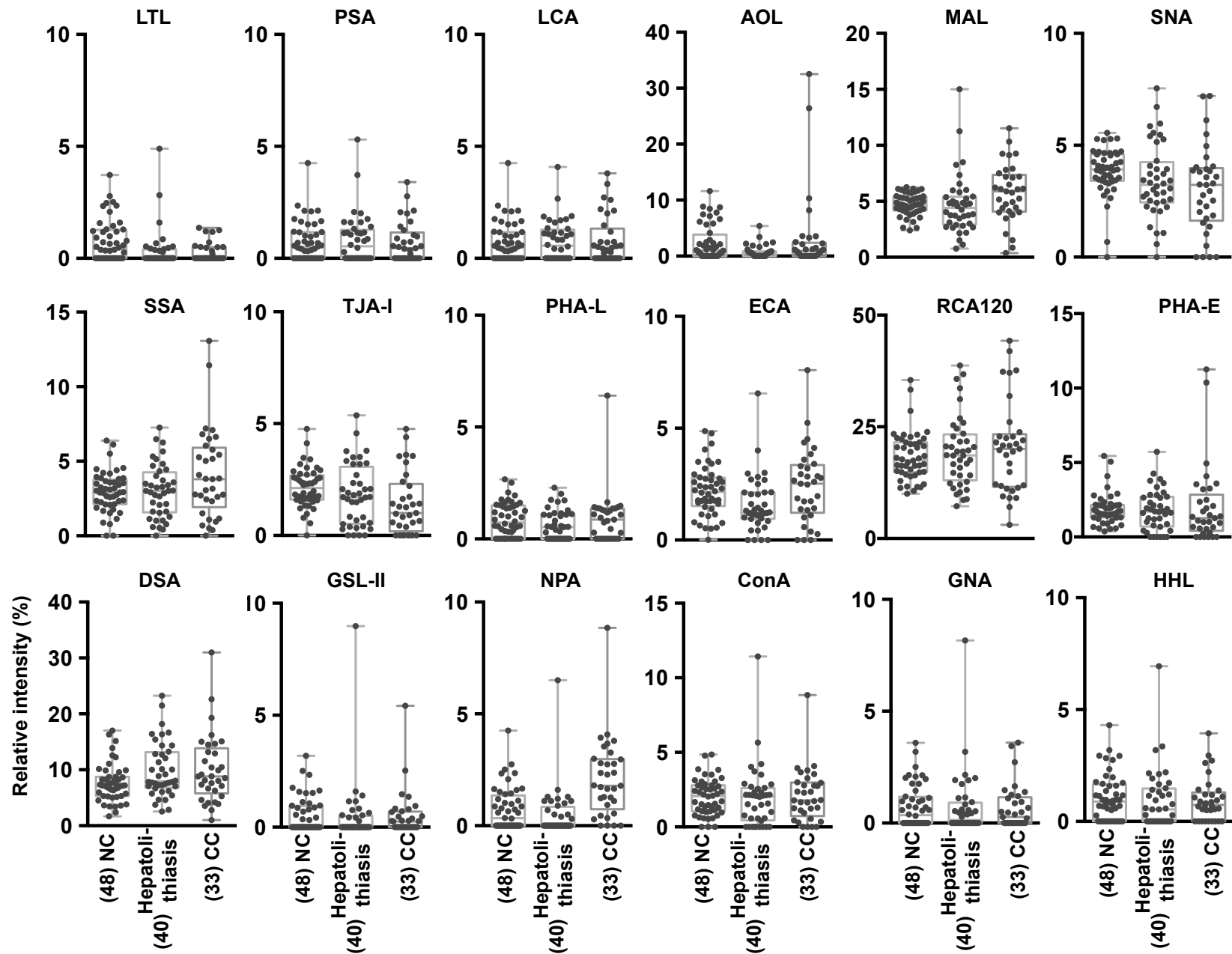


Figure S2-1. Dot plots of 36 lectin profiles in NC and patients with hepatolithiasis and cholangiocarcinoma (CC) after MPA-normalization

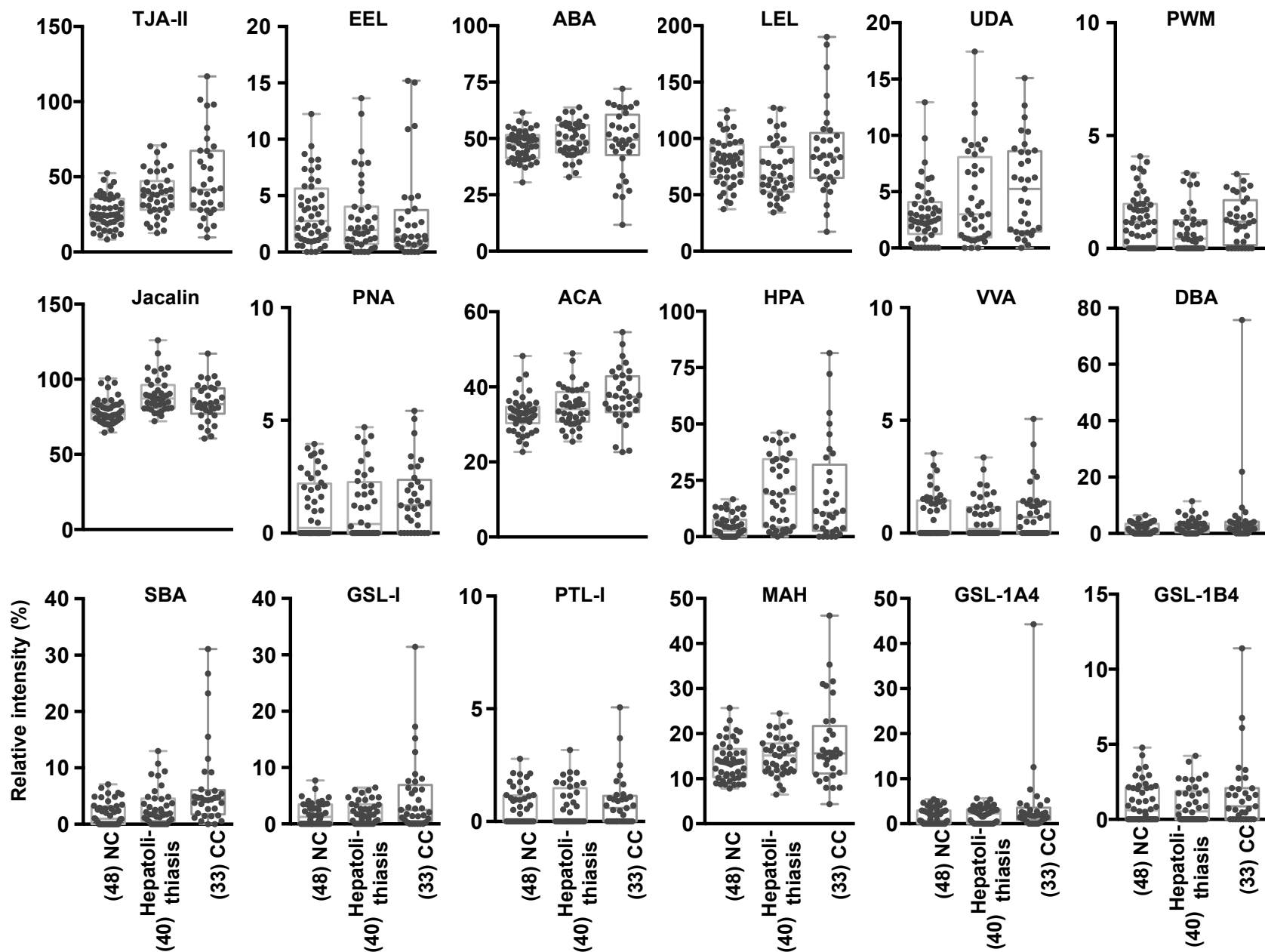


Figure S2-2. Dot plots of 36 lectin profiles in NC and patients with hepatolithiasis and cholangiocarcinoma (CC) after MPA-normalization

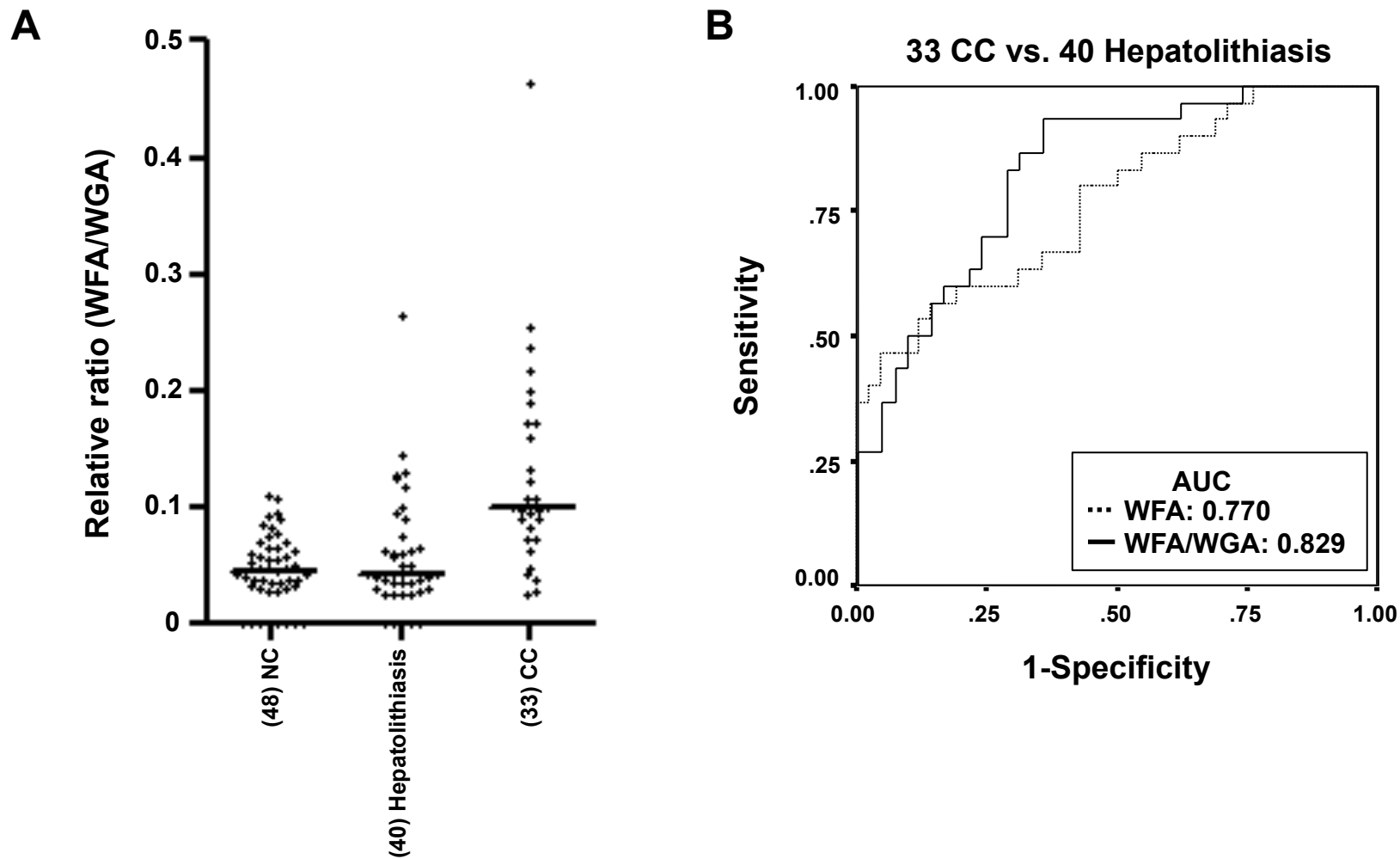


Figure S3. Combinational analysis of WFA and WGA.

(A) Dot plot of WFA/WGA ratio in NC, hepatolithiasis, and CC patients. (B) ROC curve analysis of WFA and WFA/WGA

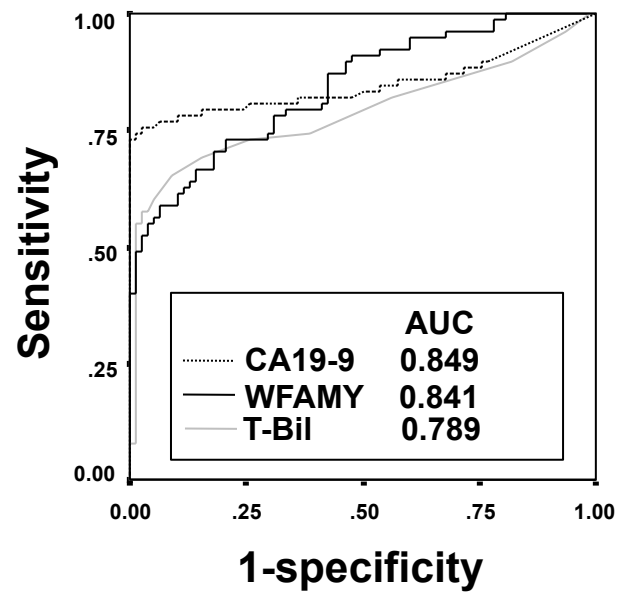


Figure S4. ROC curve of WFA-MY.1E12 ELISA, CA19-9, and total-bilirubin in cohort 1 (opisthorchiasis without CC (n = 78) and with CC (n = 78)).

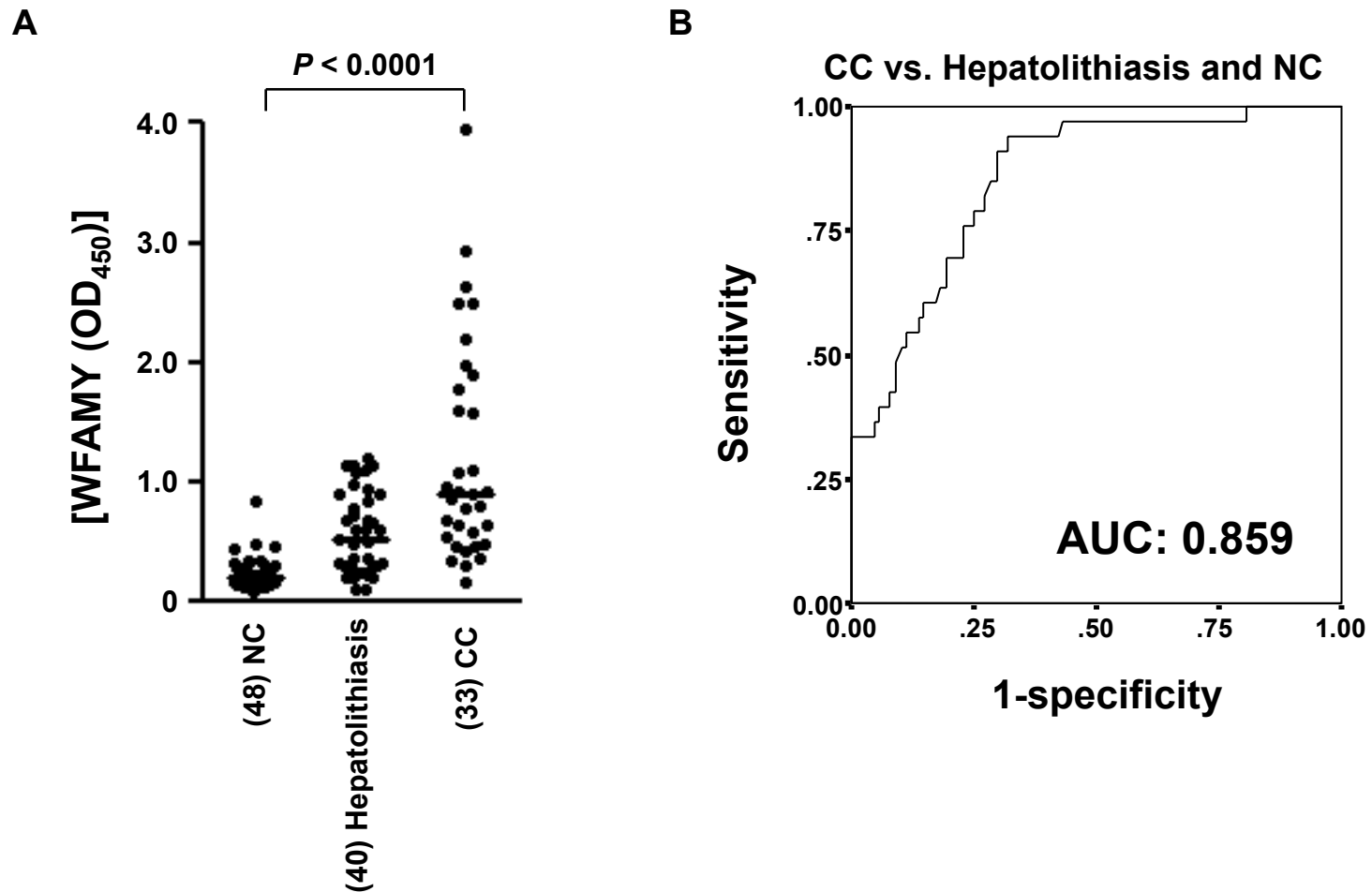


Figure S5. Serum level of WFA-sialylated MUC1 in patients with CC, hepatolithiasis, and NC in cohort 2.
(A) Dot plot of serum WFA-MY.1E12 ELISA. (B) ROC curve analysis of serum WFA-MY.1E12 ELISA.

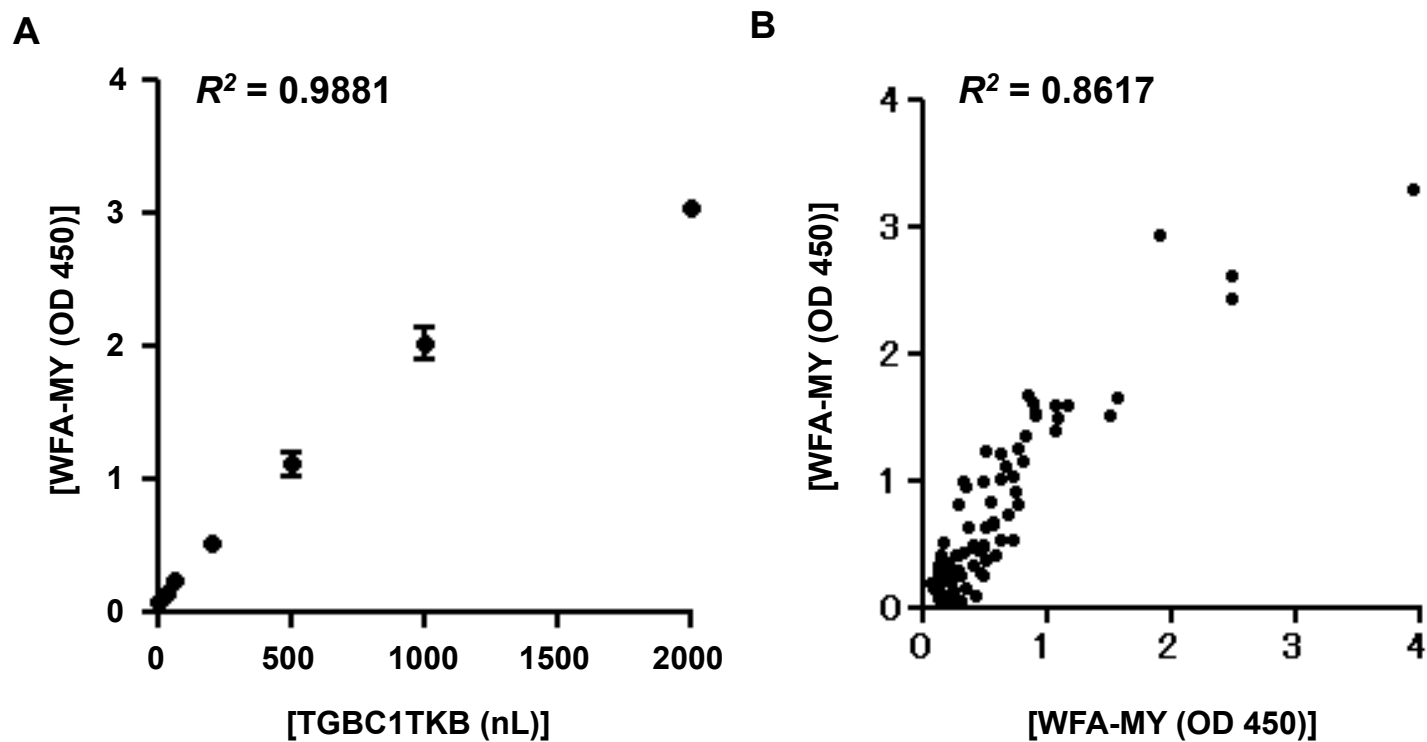


Figure S6. Linear responsibility and reproducibility of WFA-MY.1E12 sandwich ELISA.
(A) Standard curve of WFA-MY.1E12. (B) Correlation of different batches in ELISA.

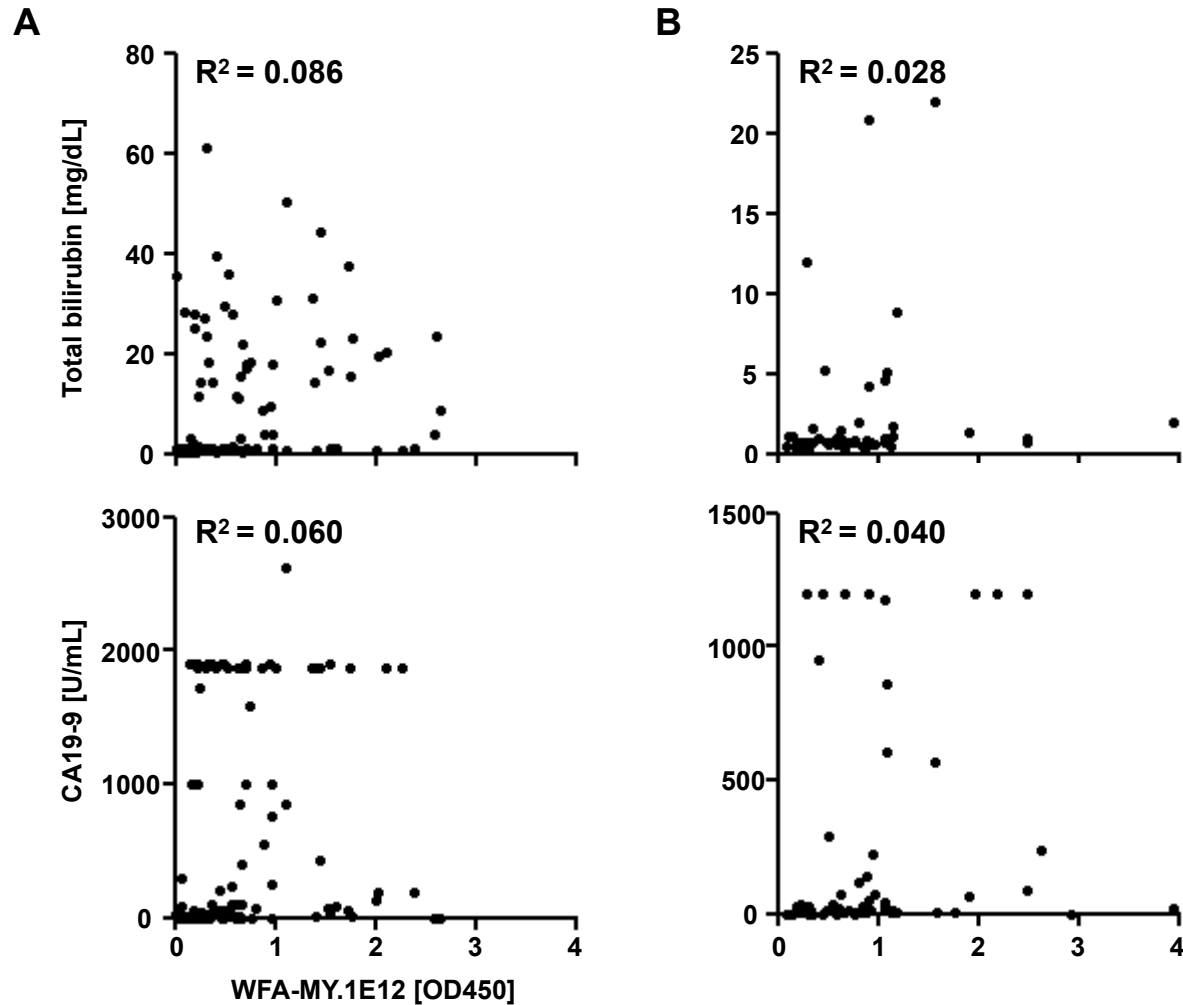


Figure S7. Correlation of WFA-sialylated MUC1 and other clinical indicators (CA19-9 and total bilirubin) in CC patients.

(A) CC in Thailand (cohort 1, n = 78). (B) CC in Japan (cohort 2, n = 33)

Supplementary Table S1. The abbreviations and carbohydrate specificities of 43 lectins of lectin array

	Lectins	Origin	Binding specificity
1	LTL	<i>Lotus tetragonobus</i>	Fuc α 1-3GlcNAc, Sia-Le ^x and Le ^x
2	PSA	<i>Pisum sativum</i>	Fuc α 1-6GlcNAc and α -Man
3	LCA	<i>Lens culinaris</i>	Fuc α 1-6GlcNAc and α -Man, α -Glc
4	UEA-I	<i>Ulex europaeus</i>	Fuc α 1-2LacNAc
5	AOL	<i>Aspergillus oryzae</i>	Terminal α -Fuc, Sia-Le ^x and Le ^x
6	AAL	<i>Aleuria aurantia</i>	Terminal α -Fuc, Sia-Le ^x and Le ^x
7	MAL	<i>Maackia amurensis</i>	Sia α 2-3Gal
8	SNA	<i>Sambucus nigra</i>	Sia α 2-6Gal/GalNAc
9	SSA	<i>Sambucus sieboldiana</i>	Sia α 2-6Gal/GalNAc
10	TJA-I	<i>Trichosanthes japonica</i>	Sia α 2-6Gal β 1-4GlcNAc β -R
11	PHA-L	<i>Phaseolus vulgaris</i>	Tri- and tetra-antennary complex oligosaccharides
12	ECA	<i>Erythrina cristagalli</i>	Lac/LacNAc
13	RCA120	<i>Ricinus communis</i>	Lac/LacNAc
14	PHA-E	<i>Phaseolus vulgaris</i>	NA ₂ and bisecting GlcNAc
15	DSA	<i>Datura stramonium</i>	(GlcNAc) _n , polyLacNAc and LacNAc (NA ₃ , NA ₄)
16	GSL-II	<i>Griffonia simplicifolia</i>	Agalactosylated N-glycan
17	NPA	<i>Narcissus pseudonarcissus</i>	Non-substituted α 1-6Man
18	ConA	<i>Canavalia ensiformis</i>	α 1-6Man (inhibited by presence of bisecting GlcNAc)
19	GNA	<i>Galanthus nivalis</i>	Non-substituted α 1-6Man
20	HHL	<i>Hippeastrum Hybrid</i>	Non-substituted α 1-6Man
21	ACG	<i>Agrocybe cylindracea</i>	Sia α 2-3Gal β 1-4 GlcNAc
22	BPL	<i>Bauhinia purpurea</i>	Gal β 1-3GalNAc and NA ₃ , NA ₄
23	TJA-II	<i>Trichosanthes japonica</i>	Fuc α 1-2Gal, β -GalNAc > NA ₃ , NA ₄
24	EEL	<i>Euonymus europaeus</i>	Gal α 1-3[Fuc α 1-2 Gal] > Gal α 1-3 Gal
25	ABA	<i>Agaricus bisporus</i>	Gal β 1-3GalNAc α -Thr/Ser (T) and sialyl-T
26	LEL	<i>Lycopersicon esculentum</i>	(GlcNAc) _n and polyLacNAc
27	STL	<i>Solanum tuberosum</i>	(GlcNAc) _n and polyLacNAc
28	UDA	<i>Urtica dioica</i>	(GlcNAc) _n and polyLacNAc
29	PWM	<i>Phytolacca americana</i>	(GlcNAc) _n and polyLacNAc
30	Jacalin	<i>Artocarpus integrifolia</i>	Gal β 1-3GalNAc α -Thr/Ser (T) and GalNAc α -Thr/Ser (Tn)
31	PNA	<i>Arachis hypogaea</i>	Gal β 1-3GalNAc α -Thr/Ser (T)
32	WFA	<i>Wisteria floribunda</i>	Terminal GalNAc (e.g., GalNAc β 1-4GlcNAc)
33	ACA	<i>Amaranthus caudatus</i>	Gal β 1-3GalNAc α -Thr/Ser (T)
34	MPA	<i>Maclura pomifera</i>	Gal β 1-3GalNAc α -Thr/Ser (T) and GalNAc α -Thr/Ser (Tn)
35	HPA	<i>Helix pomatia</i>	Terminal GalNAc
36	VVA	<i>Vicia villosa</i>	α -, β -linked terminal GalNAc and GalNAc α -Thr/Ser (Tn)
37	DBA	<i>Dolichos biflorus</i>	GalNAc α -Thr/Ser (Tn) and GalNAc α 1-3GalNAc
38	SBA	<i>Glycine max</i>	Terminal GalNAc (especially GalNAc α 1-3Gal)
39	PTL-I	<i>Psophocarpus tetragonolobus</i>	α -GalNAc and Gal
40	MAH	<i>Maackia amurensis</i>	Sia α 2-3Gal β 1-3[Sia α 2-6GalNAc] α -R
41	WGA	<i>Triticum aestivum</i>	(GlcNAc) _n and multivalent Sia
42	GSL-IA4	<i>Griffonia Simplicifolia</i>	α -GalNAc, GalNAc α -Thr/Ser (Tn)
43	GSL-IB4	<i>Griffonia Simplicifolia</i>	α -Gal

Data are compiled from the Lectin frontier Database (LfDB; <http://riodb.ibase.aist.go.jp/rcmg/glycodb/LectinSerch>).

Supplementary Table S2. Comparison of glycan profiling methods on MUC1

	Determination of the detailed glycan structure	Sample volume required for analysis*	References
Mass spectrometry	Yes	Not detectable**	<i>Storr SJ, et al. (1)</i>
Antibody microarray	No	20-120 µL	<i>Yue T, et al. (2), Chen S, et al. (3), Chen K, et al. (4), Cao Z, et al. (5)</i>
Lectin microarray (adapted in this study)	No	5 µL	
Lectin-antibody ELISA (adapted in this study)	No	20 µL	

*Sample volume required to obtain the glycan profile with 20 lectins on serum MUC1 from normal control (*Ref. 37*)

**Mass spectrometry was not applicable due to low amounts of serum MUC1 in normal control.

1 Storr, S. J. et al. *Glycobiology*. 18 (6), 456-462, (2008)

2 Yue, T. et al. *Mol Cell Proteomics*. 8 (7), 1697-1707, (2009)

3 Chen, S. et al. *Nat Methods*. 4 (5), 437-444, (2007)

4 Chen, K. et al. *J Proteome Res*. 12 (3), 2630-2640, (2013)

5 Cao, Z.; et al. *Anal Chem*. 85 (3), 1689-1702, (2013)

Supplementary Table S3-1 Relative signal intensities of all lectins.

Lectins	Norma control (N = 48)																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
LTL	0.0	0.0	0.0	1.4	0.0	1.3	0.0	2.1	0.0	0.3	2.8	0.0	0.5	0.0	1.0	1.3	2.5	0.7	0.0	0.0	0.0	1.6	2.4	0.6	0.0	3.7	2.3	0.0
PSA	0.0	1.0	0.0	0.5	0.0	0.9	0.0	1.4	0.0	0.7	0.6	0.0	1.0	0.0	2.0	1.3	2.5	0.4	0.0	0.6	0.0	2.6	2.4	1.2	1.7	4.3	2.3	0.3
LCA	0.0	1.0	0.0	0.0	0.0	0.4	0.0	0.7	0.0	0.7	1.7	0.0	0.5	0.0	1.6	0.4	2.1	0.4	0.0	1.0	0.0	1.0	2.4	1.2	0.6	4.3	1.8	0.6
UEA-I	6.1	15.7	23.6	3.9	4.0	3.4	1.7	26.4	15.8	2.8	3.3	6.7	4.3	6.7	3.3	2.6	3.5	4.7	0.8	16.8	1.8	4.2	3.5	22.7	21.8	5.9	7.0	15.9
AOL	0.0	0.0	1.1	1.0	0.0	0.4	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.4	0.4	5.8	0.6	1.0	2.4	11.6	6.1	2.1	2.9	7.1
AAL	8.8	18.2	17.6	3.9	2.0	2.1	0.6	25.0	9.2	2.1	3.3	2.2	2.4	1.2	2.3	2.2	1.1	3.6	2.8	8.7	2.9	3.7	3.5	20.9	17.3	4.3	5.8	13.0
MAL	4.8	3.5	4.4	2.4	5.1	4.3	4.1	6.3	5.4	4.2	6.1	4.4	5.7	5.5	5.2	4.7	6.0	4.7	4.3	4.2	4.7	2.6	5.9	5.8	4.5	5.9	5.3	4.9
SNA	0.7	4.0	3.3	3.4	4.0	4.7	5.2	5.6	4.3	3.5	3.9	0.0	3.8	3.0	3.9	4.7	4.6	3.9	3.5	3.9	2.9	3.7	4.7	4.7	3.9	4.3	4.7	3.6
SSA	0.0	4.5	4.4	3.9	1.5	2.6	2.9	4.2	3.8	2.1	1.7	0.0	2.9	2.1	2.6	3.0	3.2	3.9	0.8	3.9	0.9	3.1	3.5	2.9	4.5	2.7	2.3	3.6
TJA-I	3.4	2.5	0.5	1.0	3.0	2.6	1.7	3.5	2.7	1.7	2.8	0.0	2.4	1.2	2.3	1.7	2.5	2.9	0.8	1.6	1.2	1.6	4.1	2.3	1.7	1.6	2.9	1.6
PHA-L	0.7	1.5	0.0	1.4	0.0	0.9	1.7	2.1	0.0	1.4	1.7	0.0	1.4	0.3	1.6	0.4	0.4	2.5	0.0	1.0	0.6	0.0	1.8	0.0	0.6	0.0	0.6	0.3
ECA	3.4	4.0	0.5	2.4	0.5	1.7	0.0	4.9	2.2	1.7	2.2	1.8	4.3	2.7	2.3	2.6	3.5	2.5	0.8	2.6	1.5	0.5	2.4	1.7	2.8	1.1	1.8	1.6
RCA120	28.6	20.7	20.3	16.4	23.2	12.9	16.3	21.5	22.3	16.3	13.9	11.6	14.8	18.5	12.1	11.6	14.8	10.0	17.7	18.1	20.4	14.1	19.4	23.8	15.1	23.4	16.4	22.4
PHA-E	5.4	5.1	0.5	1.9	1.5	2.1	0.6	2.1	2.2	1.7	2.2	0.9	3.3	1.5	1.3	2.2	2.1	1.4	1.6	1.6	1.5	1.6	2.4	1.7	2.8	1.1	0.6	1.6
DSA	17.0	9.6	8.2	10.1	15.2	5.2	7.6	13.9	16.3	6.9	7.2	6.7	7.2	8.2	3.6	3.4	6.4	6.5	8.7	6.8	7.1	5.8	8.2	9.9	6.7	5.3	5.3	8.8
GSL-II	0.0	0.0	0.0	1.0	0.0	0.9	0.0	0.7	0.0	0.0	0.6	0.0	0.0	0.0	1.6	0.4	0.4	0.0	0.0	0.3	0.0	0.0	1.8	0.0	1.1	3.2	2.3	0.0
NPA	0.0	1.5	0.0	1.4	0.0	0.9	0.0	2.1	0.0	0.3	1.7	0.0	0.0	0.0	1.6	0.9	1.4	0.7	0.0	1.0	0.0	0.0	2.4	0.0	1.1	4.3	2.3	0.3
ConA	2.7	2.5	0.0	2.4	1.0	3.9	0.6	4.9	2.2	3.1	2.8	2.2	3.8	1.5	3.3	1.7	1.1	2.9	0.0	1.3	1.2	2.1	3.5	0.6	2.8	4.8	3.5	1.0
GNA	0.0	2.0	0.0	1.4	0.0	2.1	0.0	2.1	0.0	0.7	0.6	0.0	1.0	0.0	2.0	0.0	0.7	3.6	0.0	1.0	0.0	0.0	1.8	0.0	1.1	3.2	1.8	0.0
HHL	1.4	0.5	0.0	1.0	0.0	1.7	0.0	0.7	0.0	0.7	0.0	0.0	0.0	1.2	2.0	0.9	2.8	4.3	0.0	1.0	0.6	0.0	2.9	0.6	1.7	3.2	2.3	1.0
BPL	47.6	39.4	43.4	34.8	32.3	36.9	33.1	47.2	39.7	50.3	45.0	51.1	49.3	21.5	28.5	20.7	26.9	17.9	24.4	34.5	38.3	26.7	31.2	23.3	22.9	22.9	26.3	38.6
TJA-II	52.4	40.4	29.1	24.6	18.7	18.0	15.7	46.5	22.8	25.0	22.2	35.6	24.4	30.0	11.8	11.2	12.4	21.9	25.2	36.5	28.9	25.1	20.0	38.4	48.0	19.7	24.6	43.8
EEL	12.2	4.5	0.5	8.7	5.1	2.1	0.6	4.9	0.5	1.4	3.9	4.0	8.1	9.4	2.6	3.9	3.2	7.5	6.3	2.9	1.2	0.0	4.7	2.3	3.4	1.1	8.2	1.0
ABA	55.8	53.0	49.5	49.8	46.5	53.2	51.2	50.0	49.5	55.2	30.6	41.8	38.3	47.0	48.9	42.7	37.1	57.7	49.2	51.6	54.6	38.2	38.8	46.5	44.7	47.9	53.2	50.6
LEL	85.0	71.7	96.2	97.6	82.8	58.8	61.6	110.4	96.7	75.7	118.3	102.2	108.6	107.9	70.2	49.6	86.6	37.3	84.6	84.8	82.6	59.7	77.6	83.7	68.2	66.0	61.4	79.9
STL	81.6	64.6	89.6	95.7	84.3	56.7	62.8	104.2	88.6	69.8	115.0	98.7	104.8	98.8	69.5	65.9	93.6	48.4	86.6	77.1	79.6	63.4	78.8	91.9	87.2	72.9	72.5	82.1
UDA	12.9	7.6	2.7	6.8	4.5	5.6	1.7	9.7	5.4	4.9	3.9	2.2	6.2	2.4	3.3	0.0	0.4	0.0	0.0	2.3	1.5	0.0	4.1	2.3	2.2	0.0	2.3	2.6
PWM	3.4	2.5	0.0	1.9	0.5	1.7	0.0	2.8	2.2	2.4	0.6	1.3	3.8	0.3	2.0	1.7	0.0	1.4	0.0	1.0	0.6	0.0	3.5	0.0	1.7	0.0	1.2	0.6
Jacalin	89.8	97.5	85.7	83.1	71.7	76.0	66.3	70.8	70.1	74.0	73.9	76.0	64.6	79.1	84.3	76.3	86.2	73.5	76.4	80.3	83.2	76.4	94.7	83.1	86.0	100.5	97.7	80.8
PNA	0.0	2.0	0.0	2.9	0.0	3.4	0.0	2.1	0.0	1.4	0.6	0.0	1.9	0.0	3.6	0.0	0.0	0.0	0.0	1.6	0.0	0.0	3.5	0.0	2.2	2.7	2.9	0.0
WFA	26.5	20.2	22.0	16.4	16.7	13.7	9.9	29.2	17.9	17.7	24.4	28.4	28.2	34.2	14.1	9.5	17.0	11.5	18.5	25.5	23.6	11.0	22.9	19.8	27.4	12.8	24.6	24.0
ACA	35.4	34.3	30.2	32.9	24.7	33.5	22.7	31.9	26.6	33.0	31.7	33.8	34.4	31.8	38.4	28.9	25.4	31.2	28.3	28.4	36.3	34.0	48.2	32.6	35.8	42.0	43.3	35.7
MPA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
HPA	6.8	9.1	0.5	4.3	0.0	12.4	12.2	5.6	0.0	13.2	16.7	0.0	4.3	0.0	5.9	2.6	1.8	0.7	0.0	1.9	7.1	9.9	12.9	0.0	4.5	12.8	4.1	2.3
VVA	0.0	1.5	0.0	1.4	0.0	3.0	0.0	2.8	0.0	1.4	1.1	0.0	1.4	0.0	1.3	0.0	0.0	0.0	0.0	1.0	0.0	0.0	3.5	0.0	1.7	0.0	0.0	0.0
DBA	0.7	2.5	0.0	4.3	0.0	3.4	0.0	3.5	0.0	3.5	4.4	0.0	3.3	0.3	3.6	0.0	1.1	1.1	0.0	1.6	0.6	1.0	5.3	0.6	3.4	2.1	2.3	0.0
SBA	0.0	7.1	0.0	2.9	0.0	2.1	0.0	4.9	0.0	3.5	0.6	0.0	2.4	0.9	3.3	0.0	0.0	0.0	0.0	6.5	0.9	0.0	5.3	0.0	5.6	0.0	4.1	5.5
GSL-I	4.1	1.5	0.0	7.7	0.5	3.4	0.0	3.5	0.0	3.5	2.8	0.0	6.2	3.6	4.9	0.0	0.0	3.6	0.0	1.0	0.0	0.0	4.7	0.0	2.2	0.0	4.1	0.0
PTL-I	0.0	1.0	0.0	1.4	0.0	2.1	0.0	2.8	0.0	1.0	0.6	0.0	1.0	0.0	1.3	0.0	0.0	0.7	0.0	0.6	0.0	0.0	1.8	0.0	1.1	0.0	1.2	0.0
MAH	20.4	17.7	13.7	20.8	13.1	15.5	15.7	25.7	15.8	18.4	19.4	16.9	21.1	11.5	13.8	10.8	10.2	8.6	9.4	8.7	10.6	14.1	22.9	12.2	15.6	14.4	17.0	13.6
WGA	238.1	177.8	192.9	182.6	179.3	156.2	191.3	217.4	187.0	137.8	195.6	174.2	156.5	100.9	122.3	165.5	130.0	130.8	156.7	97.7	113.6	192.1	241.8	170.3	201.1	205.9	228.7	130.2
GSL-IA4	4.1	2.5	0.0	3.9	0.0	3.0	0.0	2.1	0.0	3.1	5.0	0.9	4.8	0.6	2.0	0.0	0.0	0.7	0.0	0.6	0.3	0.0	4.7	0.0	2.8	0.0	4.1	0.0
GSL-IB4	0.7	2.0	0.0	3.4	0.0	2.1	0.0	2.1	0.5	2.1	2.8	1.8	4.8	0.9	1.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0	2.9	0.0	2.2	0.0	2.9	0.0

The values are the medians after MPA-normalization (%).

Supplementary Table S3-2 Relative signal intensities of all lectins.

Lectins	Norma control (N = 48)																				Benign disease (N = 40)						
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	1	2	3	4	5	6	7
LTL	0.0	0.9	0.5	0.0	0.6	0.3	0.3	0.4	2.5	0.0	1.2	0.0	1.2	0.7	0.8	0.0	1.2	0.4	1.6	0.0	0.9	0.0	0.0	0.4	0.0	0.0	1.6
PSA	1.7	0.9	1.5	0.5	1.0	0.0	0.3	1.1	2.9	0.4	1.2	0.0	1.6	0.7	0.8	0.0	1.8	0.8	2.1	0.0	0.0	0.0	0.9	1.3	1.1	0.0	1.6
LCA	0.6	0.0	1.5	0.0	0.3	0.5	0.3	0.8	2.1	0.0	1.2	0.0	1.2	0.7	0.0	0.0	1.5	0.0	2.1	0.0	0.0	1.0	0.4	1.7	1.7	0.0	1.6
UEA-I	2.9	21.6	14.3	1.3	6.5	21.4	2.3	7.6	3.3	5.7	2.9	14.7	2.0	25.9	4.3	25.7	4.6	1.5	16.5	3.9	4.3	27.3	3.4	0.4	0.0	2.4	3.2
AOL	1.2	8.7	6.6	0.3	1.0	8.4	0.7	1.9	2.5	0.0	0.6	5.7	1.6	8.8	0.8	7.8	2.1	0.0	7.4	0.0	0.9	0.0	2.1	0.0	0.0	0.3	0.3
AAL	4.7	17.0	13.8	1.8	6.1	15.0	2.0	4.2	3.3	2.7	1.5	11.3	3.2	18.4	3.9	17.9	2.4	2.3	11.7	2.6	2.6	16.3	3.4	2.2	2.8	1.8	1.3
MAL	4.7	4.6	3.6	4.7	5.2	5.0	4.0	5.3	3.3	5.3	4.7	2.6	3.2	6.1	3.9	6.0	6.1	3.8	5.3	4.5	3.8	3.7	6.0	2.2	1.1	6.0	5.4
SNA	4.7	4.6	3.6	5.3	4.2	5.3	4.0	3.4	3.3	3.4	2.6	2.3	3.6	4.1	3.1	2.8	3.7	5.3	4.3	4.5	3.4	1.3	3.4	3.9	2.8	6.0	2.2
SSA	3.5	5.5	3.6	2.1	2.3	4.2	2.3	1.1	2.9	1.5	1.8	1.9	2.4	6.1	3.1	3.7	2.7	3.4	6.4	3.2	2.1	4.0	3.0	3.5	3.4	3.6	1.3
TJA-I	2.3	2.8	2.6	2.4	2.3	1.3	1.3	1.9	1.7	1.5	1.8	1.5	2.0	4.8	2.3	1.8	1.8	3.0	3.2	2.6	1.7	0.0	1.7	3.5	1.7	1.5	0.0
PHA-L	0.6	0.0	1.5	0.5	1.6	1.1	1.0	0.0	1.3	0.0	1.2	0.4	1.2	1.4	0.8	0.0	1.5	0.0	2.7	1.9	1.3	0.0	1.7	1.7	0.0	0.0	0.6
ECA	3.5	1.4	2.0	2.1	2.9	1.8	1.7	1.1	2.9	2.7	1.8	0.8	2.4	4.8	3.5	1.8	2.7	1.1	3.2	0.6	2.1	0.0	3.0	1.3	0.6	1.2	1.0
RCA120	21.5	21.1	16.3	21.1	35.5	23.2	17.0	20.5	11.3	17.9	15.0	15.5	11.5	33.3	17.4	22.5	14.3	16.7	10.6	22.7	14.1	12.3	16.7	16.6	15.8	36.7	10.9
PHA-E	2.9	1.8	2.6	1.3	1.9	0.8	0.7	0.4	2.1	1.5	1.8	1.5	2.0	4.1	2.7	0.9	1.2	1.5	2.1	1.3	3.0	0.0	1.7	1.7	2.8	1.2	0.0
DSA	7.6	8.3	7.1	8.7	12.6	11.1	5.0	7.6	1.7	9.9	3.8	4.5	2.4	12.2	7.4	6.0	3.7	3.4	5.3	7.1	7.7	4.7	7.7	7.9	6.2	21.5	5.8
GSL-II	0.0	0.0	1.5	0.0	1.0	0.8	0.0	0.0	2.5	0.0	0.9	0.0	1.6	0.0	0.0	0.0	1.5	0.0	1.1	0.0	0.0	0.0	0.4	0.4	0.0	0.0	0.6
NPA	0.6	0.0	1.0	0.0	0.6	0.0	0.0	0.0	2.5	0.0	0.6	0.0	1.2	0.0	0.8	0.0	2.7	0.0	1.6	0.0	0.0	0.0	0.4	1.3	0.0	0.0	1.0
ConA	2.3	1.4	3.1	0.5	2.6	1.1	1.7	0.8	2.5	0.8	1.5	0.0	2.4	2.0	1.6	1.4	3.0	1.1	2.7	0.6	2.1	1.0	2.1	2.6	0.6	2.1	2.6
GNA	0.6	0.0	1.0	0.0	0.3	0.0	0.0	0.8	2.5	0.0	0.6	0.0	1.2	0.0	0.4	0.0	2.1	0.0	1.1	0.0	0.0	0.0	0.4	1.7	0.0	0.0	1.9
HHL	1.2	0.0	2.0	0.3	1.0	0.8	0.7	1.1	2.9	0.0	1.8	0.0	1.6	0.0	1.2	0.9	2.7	0.8	1.6	0.0	0.0	0.0	1.7	1.3	0.0	0.6	1.9
BPL	23.8	24.8	17.9	31.1	49.0	30.1	27.0	23.5	15.1	25.2	27.9	18.9	20.2	36.1	22.1	32.6	47.9	20.1	22.3	22.1	44.0	42.0	57.1	29.7	35.6	39.4	71.6
TJA-II	34.9	38.5	21.9	14.2	37.7	28.2	14.7	29.9	8.4	22.9	19.9	24.5	13.8	36.1	24.0	37.6	29.6	10.6	32.4	18.2	35.0	57.0	38.2	27.1	41.2	28.1	40.6
EEL	5.8	0.0	2.0	0.3	6.5	1.1	1.0	4.2	1.7	7.3	1.5	0.0	2.4	2.0	7.4	0.9	1.8	1.5	3.7	5.8	6.8	0.0	2.1	3.1	1.7	0.0	1.0
ABA	41.3	40.4	50.5	61.5	51.0	56.7	45.7	51.9	46.9	43.5	41.1	54.3	42.7	40.8	40.7	39.4	49.1	39.4	46.3	43.5	55.6	42.7	48.1	55.0	45.2	59.7	42.8
LEL	93.6	112.4	76.5	79.7	125.2	78.4	65.7	79.2	43.9	82.1	65.7	56.2	42.7	95.2	72.5	87.6	97.6	48.5	51.6	90.3	78.2	79.3	79.4	49.3	53.1	80.3	115.3
STL	107.6	113.8	85.2	89.2	119.7	82.1	70.0	89.8	54.4	97.7	65.7	64.5	47.8	107.5	81.0	89.9	89.9	64.8	68.6	113.0	73.1	67.7	92.3	46.3	53.1	73.1	106.7
UDA	3.5	0.0	3.1	0.8	3.5	2.9	1.7	1.1	2.5	1.9	3.5	0.0	1.6	6.1	4.3	2.8	3.0	0.8	2.1	0.0	3.0	0.0	3.0	8.7	2.8	0.9	1.3
PWM	1.2	0.0	3.6	0.8	1.9	1.1	1.3	0.0	1.7	0.8	1.2	0.0	2.0	4.1	3.1	0.0	1.8	1.1	2.1	0.0	3.0	0.0	1.3	0.4	0.0	0.6	0.6
Jacalin	81.4	80.7	84.7	82.8	79.0	77.6	74.0	77.3	74.1	76.0	70.1	75.1	71.1	72.8	70.2	69.7	75.0	72.0	79.3	82.5	90.6	90.3	80.3	90.4	92.7	87.2	78.6
PNA	1.2	0.0	2.0	0.0	1.0	0.0	1.0	0.0	3.8	0.0	2.6	0.0	4.0	0.0	1.6	0.5	2.4	0.0	3.2	0.0	1.7	0.0	2.6	3.5	0.0	0.3	3.2
WFA	25.6	22.9	19.9	17.7	46.8	25.3	15.7	23.1	11.7	23.3	18.5	18.5	13.4	25.9	23.6	28.9	25.0	6.8	20.7	20.1	22.6	28.7	37.3	11.8	6.2	28.7	38.0
ACA	37.2	27.1	31.1	28.2	33.2	27.7	30.7	33.7	33.5	31.3	33.1	31.3	34.8	31.3	35.3	33.0	39.0	31.4	32.4	27.3	39.3	35.3	32.6	36.7	31.6	29.0	47.0
MPA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
HPA	2.9	0.0	2.0	11.1	1.9	0.0	7.7	0.4	4.6	0.0	8.2	0.0	5.5	0.0	1.9	0.0	14.3	2.7	2.1	0.0	3.0	2.0	20.2	21.4	42.9	19.4	34.2
VVA	0.6	0.0	1.5	0.0	1.3	0.0	1.0	0.0	2.5	0.0	1.2	0.0	2.0	0.0	1.6	0.0	2.1	0.0	1.6	0.0	0.9	0.0	1.7	1.7	0.0	0.0	1.0
DBA	3.5	0.0	4.6	0.5	2.6	0.0	2.3	0.0	4.2	0.0	3.2	0.0	3.6	0.0	3.1	0.0	6.4	1.9	4.3	0.0	1.7	0.0	6.4	3.5	0.0	2.1	7.7
SBA	2.3	0.0	1.5	0.5	2.6	1.1	2.0	0.0	2.9	0.0	3.2	0.4	2.8	2.7	2.7	0.9	4.9	0.0	4.8	0.0	2.1	1.3	6.9	3.1	0.0	0.9	4.5
GSL-I	3.5	0.0	1.5	0.0	1.9	0.0	1.7	0.0	2.5	0.8	2.6	0.0	2.8	0.0	3.9	0.0	2.7	0.0	1.6	0.0	4.7	0.0	4.7	3.1	0.0	0.9	3.5
PTL-I	1.7	0.0	0.5	0.0	1.0	0.0	0.3	0.0	2.1	0.0	1.2	0.0	2.0	0.0	1.6	0.0	0.9	0.0	2.1	0.0	1.7	0.0	1.3	2.2	0.0	0.0	0.0
MAH	19.2	11.0	10.2	8.7	13.9	9.0	10.0	8.7	13.8	11.5	13.5	8.7	12.3	13.6	19.4	7.8	13.4	9.5	14.4	11.0	19.2	11.7	11.2	15.3	22.6	12.5	18.8
WGA	247.1	156.0	185.2	100.8	93.9	105.8	122.7	130.3	160.3	155.7	113.8	136.6	142.7	198.6	143.8	111.9	95.1	164.0	158.0	181.8	157.7	145.3	116.3	171.2	214.1	79.4	119.8
GSL-IA4	4.7	0.0	1.0	0.0	1.9	0.0	2.0	0.0	2.9	0.4	2.9	0.0	2.8	0.0	5.4	0.0	3.7	0.0	2.1	0.0	4.3	0.0	3.9	3.1	0.0	0.3	1.6
GSL-IB4	3.5	0.0	0.5	0.0	2.3	0.0	0.7	0.0	0.8	0.0	1.2	0.0	2.4	1.4	4.3	0.0	1.2	0.0	2.1	0.0	3.8	0.0	1.7	1.7	0.0	0.0	0.3

Supplementary Table S3-3 Relative signal intensities of all lectins.

Lectins	Benign disease (N = 40)																															
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32							
LTL	0.0	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	4.9	2.8							
PSA	1.2	0.0	0.3	0.0	1.1	1.8	3.7	0.0	0.0	1.1	0.0	0.0	0.8	0.6	0.0	0.0	1.1	1.1	1.4	0.0	1.6	0.0	0.0	5.3	0.5							
LCA	1.2	0.0	0.0	0.0	1.7	1.3	2.7	0.0	1.1	1.9	0.0	0.0	0.4	0.6	0.0	0.0	0.5	1.1	1.9	0.0	1.1	0.0	0.0	4.1	0.9							
UEA-I	2.3	3.7	1.7	41.5	2.9	1.8	12.2	4.6	1.7	2.6	2.2	0.0	1.5	0.0	0.8	6.1	1.1	0.8	3.3	7.1	3.8	0.0	1.3	6.5	3.8							
AOL	0.6	5.4	0.6	0.8	3.4	0.0	0.5	0.9	0.0	2.2	0.0	0.0	1.2	0.0	0.0	0.8	0.5	0.4	0.0	0.0	0.0	0.0	0.0	2.4	1.9							
AAL	0.6	6.4	0.8	23.4	3.4	3.1	13.8	1.4	1.1	2.2	1.1	0.4	0.8	0.6	2.5	3.6	2.6	1.9	7.5	4.0	3.8	10.2	1.7	2.0	2.8							
MAL	2.9	4.3	3.1	5.2	4.6	4.8	4.8	4.0	15.0	3.7	2.8	2.2	3.5	3.0	8.3	4.9	2.6	2.7	8.5	6.6	3.8	0.8	11.3	7.3	4.7							
SNA	0.6	1.1	2.3	2.8	5.1	5.3	5.9	2.9	5.6	3.7	3.9	2.6	2.7	3.0	3.7	2.4	3.2	0.0	7.5	2.5	4.3	5.5	2.1	4.1	3.3							
SSA	0.6	0.5	1.1	7.3	5.1	4.8	5.3	4.3	4.4	2.2	3.4	0.0	1.5	3.0	3.7	1.6	2.6	0.8	5.7	3.0	3.2	6.3	0.4	2.9	3.3							
TJA-I	2.3	3.2	0.3	0.4	4.6	3.5	3.2	0.3	3.3	1.5	0.6	0.0	0.4	1.8	2.1	0.8	1.6	1.9	3.8	0.0	3.2	2.3	0.8	1.6	1.9							
PHA-L	0.6	0.5	0.6	0.0	2.3	0.0	0.5	0.3	0.0	1.1	0.0	0.0	1.2	0.0	0.0	0.4	1.1	1.1	0.0	0.0	0.5	0.0	0.0	0.8	1.4							
ECA	1.2	2.1	0.8	1.2	4.0	1.3	2.1	1.4	6.6	3.0	1.1	0.4	1.2	1.2	1.2	1.2	1.6	0.8	0.9	1.0	1.6	0.0	0.4	2.0	2.8							
RCA120	9.8	18.6	8.8	20.6	23.4	31.1	19.7	22.8	21.7	20.4	25.8	18.5	11.2	25.3	19.4	19.4	18.5	12.6	38.7	21.7	20.4	33.6	17.6	8.6	10.3							
PHA-E	2.3	4.3	0.3	0.0	5.7	2.6	2.1	0.9	3.9	1.9	1.7	0.4	1.9	3.6	1.2	0.0	2.6	1.5	2.8	0.0	1.6	0.8	1.3	1.6	1.9							
DSA	4.6	14.4	2.5	8.9	15.4	16.7	10.1	12.7	10.0	16.4	7.9	7.3	5.4	13.3	12.8	11.3	10.1	7.3	7.5	18.2	8.1	16.4	6.7	2.9	7.0							
GSL-II	1.2	0.0	0.3	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.5	0.8	0.0	0.0	0.5	0.0	0.0	9.0	1.4							
NPA	1.2	0.0	0.3	0.0	1.1	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	0.0	0.0	1.6	0.0	0.0	6.5	0.9							
ConA	2.9	0.0	0.6	2.0	2.9	3.5	3.7	0.6	0.0	1.5	0.0	0.0	0.8	4.2	1.2	0.4	2.1	2.3	5.7	1.5	2.7	1.6	0.0	11.4	2.3							
GNA	0.6	0.0	0.3	0.0	1.1	0.4	3.2	0.0	0.0	1.1	0.0	0.0	0.4	0.6	0.0	0.0	0.5	1.9	0.5	0.0	2.2	0.0	0.0	8.2	0.9							
HHL	0.6	0.0	0.3	0.0	1.1	2.2	3.2	0.3	0.0	1.5	0.0	0.0	0.8	1.2	0.0	0.0	2.1	1.1	0.9	0.0	2.2	0.0	0.0	6.9	1.4							
BPL	37.6	41.5	31.9	79.8	45.1	46.1	33.5	37.3	40.0	39.0	42.1	15.1	23.2	41.6	40.9	42.5	18.0	33.0	34.4	58.1	40.3	58.6	14.6	44.5	22.5							
TJA-II	31.2	56.9	18.6	71.0	47.4	54.4	39.9	36.4	23.3	26.0	40.4	14.2	16.2	38.0	46.3	43.3	18.0	31.0	59.4	53.5	41.4	66.4	12.6	28.2	37.6							
EEL	2.9	8.0	0.3	1.6	4.0	2.2	3.7	7.8	1.1	8.9	1.1	0.0	3.1	1.8	0.4	0.4	2.1	1.1	12.3	13.6	2.7	0.8	0.0	1.6	6.1							
ABA	43.9	63.8	45.5	38.3	56.6	61.8	53.7	52.0	54.4	56.1	45.5	50.9	44.8	42.8	47.9	43.7	50.8	55.6	57.5	38.4	51.6	43.8	56.9	34.7	50.2							
LEL	37.6	60.6	46.6	126.2	74.9	58.8	52.7	74.9	55.6	62.5	56.7	48.3	51.4	88.6	102.5	100.0	63.5	41.4	93.9	127.3	46.8	58.6	40.6	99.2	69.0							
STL	42.8	61.2	48.3	108.9	65.7	57.0	49.5	66.2	56.1	72.5	52.2	50.9	49.4	75.3	90.1	90.7	59.8	38.7	84.0	125.3	45.2	59.4	41.4	86.5	69.5							
UDA	4.0	6.9	0.6	4.4	12.0	8.3	9.6	0.9	3.3	3.7	6.7	0.0	1.2	9.6	5.4	0.8	2.6	7.3	12.7	6.6	9.1	8.6	0.0	0.8	1.9							
PWM	0.0	0.0	0.3	0.4	2.9	0.0	1.1	0.9	0.0	3.3	0.0	0.0	1.2	0.6	0.0	0.4	1.1	1.1	0.0	0.0	3.2	0.0	0.4	0.0	2.8							
Jacalin	87.3	96.3	72.0	79.8	80.6	105.3	106.9	77.5	80.6	84.4	107.9	89.7	83.8	103.0	107.9	80.6	88.9	95.8	125.9	77.3	117.2	99.2	85.8	75.5	89.2							
PNA	4.0	0.0	1.4	0.0	1.7	0.0	4.3	0.0	0.0	1.1	0.0	0.0	2.3	1.8	0.0	0.0	2.1	1.1	0.5	0.0	4.3	0.0	0.0	1.2	2.8							
WFA	11.0	15.4	20.6	48.8	17.7	20.2	22.3	19.4	9.4	27.5	15.7	6.9	8.9	18.7	14.5	38.5	11.1	12.3	21.2	28.8	20.4	32.0	5.4	24.9	16.4							
ACA	39.9	31.4	30.5	40.7	35.4	39.0	42.6	28.3	30.6	30.1	34.8	26.7	28.2	39.2	35.1	35.6	30.2	33.0	40.6	39.4	48.9	31.3	26.8	33.1	34.7							
MPA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0							
HPA	37.0	5.3	7.1	4.4	44.6	26.8	13.8	0.0	42.8	1.1	18.5	2.6	7.3	15.7	34.7	29.1	7.9	20.3	3.3	2.0	43.5	46.1	2.5	36.7	4.2							
VVA	1.2	0.0	0.8	0.0	1.1	0.0	1.6	0.0	0.0	0.4	0.0	0.0	0.4	1.8	0.0	0.0	2.1	0.4	0.0	0.0	1.1	0.0	0.0	0.8	2.8							
DBA	3.5	0.0	2.5	0.8	5.7	0.4	4.3	0.0	1.7	1.1	1.1	0.0	2.7	2.4	1.2	1.6	4.2	3.4	0.0	0.0	8.1	1.6	0.0	2.4	2.8							
SBA	1.7	0.0	2.5	8.9	4.6	1.8	5.9	0.9	0.0	3.7	2.2	0.0	1.9	3.6	1.2	4.9	2.6	1.1	0.5	0.5	8.6	9.4	0.0	1.6	2.3							
GSL-I	1.7	2.7	1.4	0.0	3.4	1.3	4.3	0.6	0.0	2.2	0.0	0.0	2.3	2.4	0.8	0.4	2.6	2.7	4.2	5.6	6.5	0.0	0.0	1.6	4.7							
PTL-I	1.7	0.0	0.8	0.0	1.1	0.0	0.5	0.0	0.0	0.7	0.0	0.0	1.5	0.0	0.0	0.0	3.2	1.1	0.0	0.0	1.6	0.0	0.0	0.4	1.9							
MAH	19.1	16.5	8.5	21.4	17.1	16.2	19.7	11.0	17.2	12.3	14.0	6.5	13.5	21.7	15.7	15.0	11.6	11.9	21.7	17.7	12.9	10.2	7.5	24.5	16.4							
WGA	212.7	198.9	74.9	134.3	203.4	163.2	203.7	82.7	192.8	116.4	216.3	150.4	124.3	203.6	155.4	135.6	194.2	144.1	186.8	169.7	163.4	246.1	149.4	140.0	155.4							
GSL-IA4	2.9	0.5	2.0	0.0	4.6	0.0	1.6	0.3	0.0	2.2	0.0	0.0	2.7	3.0	0.8	2.0	4.2	2.3	2.4	3.5	3.2	0.0	0.0	2.9	5.6							
GSL-IB4	1.2	0.0	0.8	0.0	1.7	0.0	1.6	0.9	0.0	3.0	0.0	0.0	1.9	0.6	0.0	0.0	2.6	0.8	0.5	1.0	2.2	0.0	0.0	0.0	4.2							

Supplementary Table S3-4 Relative signal intensities of all lectins.

Lectins	Benign disease (N = 40)								Cholangiocarcinoma (N = 33)															
	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LTL	0.0	0.4	0.0	0.7	0.0	0.3	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.2	0.0	0.5	0.0
PSA	0.0	0.8	0.0	2.0	0.0	0.0	1.6	2.1	0.4	0.0	2.8	1.4	0.9	0.0	0.0	0.0	0.0	0.5	0.0	0.0	2.1	0.0	0.7	0.0
LCA	0.0	0.8	0.0	1.3	0.0	0.0	1.1	0.8	0.4	0.7	3.3	0.5	1.2	0.0	0.0	0.0	0.0	0.5	0.0	0.6	1.5	0.0	0.7	0.0
UEA-I	8.1	5.4	2.0	4.0	0.0	2.4	1.6	0.0	0.4	27.0	2.8	0.9	12.1	13.5	26.4	51.2	12.2	6.5	0.0	0.6	25.4	58.6	3.2	0.7
AOL	1.6	0.4	0.7	0.7	0.0	0.7	0.5	0.0	0.4	1.0	1.1	0.0	1.2	0.0	3.6	0.9	0.5	8.2	0.0	0.0	10.3	0.0	1.5	0.2
AAL	4.9	1.7	2.4	6.7	0.0	0.7	2.7	0.0	14.5	25.1	5.8	1.9	13.9	6.3	10.4	19.1	1.0	11.4	0.0	0.9	15.0	21.2	3.2	0.9
MAL	4.9	5.0	4.8	5.4	1.5	3.8	2.7	5.8	4.1	5.2	6.1	4.7	4.4	2.1	5.8	7.9	7.1	9.3	0.4	0.9	5.9	3.5	4.9	4.0
SNA	5.4	3.3	3.1	6.7	3.5	2.0	1.1	2.5	1.7	3.9	7.2	0.0	3.8	1.0	3.3	1.9	0.5	3.8	0.0	2.0	3.2	0.0	3.0	2.4
SSA	6.5	2.9	2.7	4.7	1.0	1.0	1.6	2.1	1.1	6.6	5.3	0.9	6.5	0.7	5.8	6.0	0.5	3.8	0.4	1.2	5.0	2.3	2.7	2.4
TJA-I	3.8	2.1	0.3	5.4	0.5	0.7	2.7	2.1	0.6	2.2	3.6	1.4	3.6	1.4	0.0	0.0	0.0	1.6	0.0	0.6	0.6	0.0	2.7	0.4
PHA-L	1.1	1.7	0.3	2.0	0.0	1.0	1.1	0.0	1.1	0.7	0.3	1.4	1.5	0.0	0.0	0.0	0.0	1.6	0.0	0.9	1.2	0.0	6.4	0.4
ECA	2.7	2.5	1.4	2.7	0.0	2.0	1.1	0.0	0.0	2.0	1.1	0.0	2.7	2.8	4.1	1.9	1.0	4.4	0.0	0.6	2.9	1.7	2.6	1.3
RCA120	35.7	17.5	24.6	26.8	14.6	7.2	14.1	12.0	9.1	37.1	11.9	11.4	22.5	21.2	37.6	26.0	3.0	37.3	9.4	10.7	19.8	31.9	19.5	11.1
PHA-E	3.8	2.1	0.7	3.4	0.0	1.0	2.7	0.4	10.4	1.7	2.5	2.4	3.3	1.4	1.1	0.0	1.0	1.4	0.0	0.3	1.5	0.6	3.2	0.2
DSA	23.2	7.1	14.3	12.1	6.1	3.8	9.2	7.5	3.9	14.5	6.6	7.1	15.1	10.4	11.5	4.2	1.0	22.6	5.3	4.6	9.1	16.2	8.1	7.3
GSL-II	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.8	0.5	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.3	1.5	0.0	5.4	0.0
NPA	0.0	1.3	0.0	0.7	0.0	0.0	0.5	0.0	0.0	0.2	0.8	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.7	0.0	0.0
ConA	2.2	2.1	0.0	4.0	0.0	0.0	2.2	0.0	3.7	1.2	2.8	2.4	3.0	0.3	1.6	0.9	0.0	3.0	0.0	0.3	2.4	0.0	3.9	0.4
GNA	0.0	0.8	0.0	2.0	0.0	0.0	0.5	0.0	0.2	0.5	1.4	0.5	0.9	0.0	0.0	0.0	0.0	0.3	0.0	0.0	1.5	0.0	3.4	0.0
HHL	0.5	1.7	0.0	3.4	0.0	0.0	0.5	0.0	0.9	0.7	1.1	0.9	0.9	0.0	0.5	0.0	0.5	0.5	0.0	0.0	2.9	0.0	3.9	0.7
BPL	58.4	36.7	33.4	42.3	28.3	22.2	50.3	41.1	22.7	76.9	57.1	28.0	32.5	57.3	50.5	78.6	59.9	64.3	43.8	43.2	43.1	92.8	51.5	37.6
TJA-II	70.3	29.2	33.1	53.7	34.3	21.5	43.8	30.7	17.3	82.6	48.5	32.7	41.4	56.6	33.0	67.4	9.6	38.4	17.4	25.9	55.5	97.4	44.8	31.4
EEL	2.2	7.9	0.0	4.0	0.5	0.7	5.4	1.2	0.6	0.5	3.6	2.4	2.4	1.4	0.5	0.0	11.2	1.4	0.0	0.9	2.7	0.0	3.0	0.2
ABA	45.9	39.6	61.8	32.9	58.6	47.8	45.9	56.4	63.9	63.9	44.0	59.7	63.6	47.6	46.7	33.5	11.7	64.9	24.5	26.8	54.9	45.8	51.2	55.5
LEL	112.4	110.8	95.9	59.1	34.3	64.8	67.0	65.6	17.3	102.5	54.3	40.8	65.7	85.1	107.4	163.3	190.2	108.2	98.1	77.5	66.4	122.6	70.7	61.7
STL	117.8	104.6	86.0	61.7	33.3	71.7	60.5	62.2	13.4	103.2	63.7	39.3	66.3	79.2	100.5	140.5	215.2	94.3	98.5	77.8	80.5	122.9	70.0	58.4
UDA	1.1	2.1	0.7	17.4	2.5	0.7	9.2	1.7	1.3	10.3	7.5	8.5	15.1	6.3	1.6	6.0	1.5	6.3	0.0	1.2	2.4	6.1	4.2	0.7
PWM	1.6	1.7	0.3	2.0	0.0	1.4	1.1	0.0	0.0	1.0	0.8	0.0	1.5	2.8	1.4	0.0	1.5	3.0	0.0	0.3	2.1	0.3	2.2	1.1
Jacalin	83.2	83.8	82.6	85.2	87.4	80.9	84.9	99.6	80.8	100.7	92.2	81.5	86.1	102.1	72.0	68.8	78.2	84.2	83.4	85.0	89.1	87.8	101.5	80.4
PNA	0.0	2.1	0.0	4.7	0.0	0.3	2.7	0.0	1.1	1.2	4.4	1.9	3.0	0.3	0.0	0.0	0.0	2.5	0.0	1.4	3.2	0.0	5.4	1.3
WFA	48.1	32.1	23.2	32.9	5.1	13.0	25.4	17.0	18.7	54.5	21.9	12.3	18.9	32.6	51.1	78.1	73.1	55.6	14.7	25.4	40.7	77.1	33.3	21.8
ACA	33.0	25.4	33.4	36.2	31.8	35.2	37.3	32.0	46.4	51.4	54.6	37.9	35.5	32.6	23.9	32.6	42.6	43.1	22.6	34.6	34.5	33.9	40.9	32.5
MPA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
HPA	41.6	0.8	34.5	33.6	29.8	11.9	31.4	15.4	38.9	3.7	50.1	37.0	9.5	3.1	0.0	0.0	2.0	4.4	0.0	10.7	3.8	0.0	72.2	14.9
VVA	0.0	1.3	0.0	3.4	0.0	1.0	2.2	0.0	1.3	0.5	2.5	1.4	1.2	0.0	0.0	0.0	0.5	1.4	0.0	0.9	1.5	0.0	3.9	0.0
DBA	7.0	2.1	3.4	11.4	0.5	2.4	5.4	0.0	0.0	1.7	9.1	3.8	1.2	2.1	0.0	0.0	1.5	1.9	0.0	1.2	2.1	0.0	21.9	3.6
SBA	13.0	3.3	0.0	10.7	0.0	1.7	4.9	0.0	0.0	5.4	4.7	1.4	5.9	5.6	3.6	9.3	0.5	4.9	0.0	1.4	6.2	1.2	15.5	4.7
GSL-I	1.6	3.3	0.7	6.0	0.0	2.4	5.9	1.7	1.5	0.7	7.5	4.3	3.0	1.4	0.0	0.0	17.3	2.7	0.0	1.2	2.1	0.0	5.4	1.3
PTL-I	0.0	2.1	0.0	0.7	0.0	1.7	2.2	0.0	0.0	1.0	2.5	0.5	0.6	1.0	0.0	0.0	0.5	1.1	0.0	0.3	1.2	0.0	3.7	0.0
MAH	11.4	16.7	13.3	12.1	11.6	13.3	16.2	17.8	12.3	22.9	22.7	14.2	14.8	19.8	8.0	15.8	46.2	15.0	7.9	11.0	9.4	11.3	31.0	10.7
WGA	194.6	139.6	118.4	194.6	175.8	116.7	187.6	151.0	92.7	106.9	122.4	163.5	131.7	151.4	86.8	128.4	209.1	81.5	149.8	139.5	142.2	122.9	104.7	93.5
GSL-IA4	3.8	2.5	3.1	4.0	0.0	2.7	5.4	0.0	5.2	0.5	4.2	1.9	2.4	1.7	0.0	0.0	6.1	1.9	0.0	1.2	1.8	0.3	12.6	2.2
GSL-IB4	0.0	2.1	0.0	2.7	0.0	2.7	2.7	0.0	0.0	0.7	2.8	0.5	2.1	2.1	0.3	0.0	6.1	1.6	0.0	0.9	1.2	0.0	3.4	0.0

Supplementary Table S3-5 Relative signal intensities of all lectins.

Lectins	Cholangiocarcinoma (N = 33)																	
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
LTL	0.0	0.0	0.0	0.0	0.5	0.0	1.3	0.0	0.5	0.2	0.3	0.7	0.0	1.2	1.4	0.0	0.0	
PSA	1.0	0.6	0.5	0.4	0.7	0.0	1.3	0.0	0.5	0.2	1.0	2.1	0.0	2.0	3.4	1.6	0.0	
LCA	0.3	0.3	0.2	0.0	0.7	0.0	3.8	0.0	0.5	0.6	2.6	2.1	0.0	2.0	2.7	2.2	0.0	
UEA-I	2.1	2.2	2.9	51.4	5.7	1.6	17.7	25.8	3.0	4.5	33.3	18.4	26.0	19.2	6.8	1.6	6.3	
AOL	0.0	1.1	2.3	32.5	3.5	0.0	2.5	0.0	0.8	26.4	3.3	2.1	0.0	1.2	0.7	0.0	0.0	
AAL	7.3	1.4	3.2	43.9	5.4	16.0	12.7	11.0	4.8	31.5	36.9	14.9	7.3	15.2	4.8	2.2	13.1	
MAL	6.2	5.2	7.2	6.1	3.8	9.2	1.5	10.3	4.0	9.1	7.5	7.8	6.5	7.2	6.1	4.4	11.5	
SNA	2.8	3.9	4.1	3.6	4.0	1.4	2.5	3.2	2.3	4.5	7.2	5.0	1.5	3.6	6.1	5.5	0.0	
SSA	2.8	2.8	3.2	11.4	2.6	5.4	3.8	5.2	1.5	4.1	13.1	7.1	3.1	7.2	6.8	3.8	0.0	
TJA-I	1.7	0.8	0.9	0.0	1.4	0.0	1.3	1.3	1.0	1.0	3.3	3.5	0.4	2.4	4.8	4.4	0.0	
PHA-L	0.0	1.4	1.4	0.0	0.9	0.3	1.3	0.0	1.3	1.4	1.3	1.4	0.0	0.8	1.4	1.1	0.0	
ECA	1.7	1.4	2.5	2.9	1.4	0.3	7.6	4.5	2.5	3.3	3.6	2.8	0.4	3.2	3.4	3.8	5.2	
RCA120	20.8	12.2	20.0	22.9	14.9	7.1	21.5	41.9	9.1	44.3	11.8	22.0	16.8	22.8	23.8	18.7	20.8	
PHA-E	2.1	0.0	0.7	0.0	0.9	0.5	1.3	1.9	1.0	11.3	0.7	3.5	0.0	3.6	4.1	4.9	0.0	
DSA	7.6	8.0	14.6	15.0	3.5	4.1	8.9	31.0	2.8	10.5	19.3	8.5	9.9	8.8	12.9	13.2	6.3	
GSL-II	0.0	0.3	0.7	0.0	0.9	0.0	2.5	0.0	0.3	0.4	0.0	0.7	0.0	0.8	1.4	0.0	0.0	
NPA	0.0	0.0	0.2	0.0	0.7	0.0	2.5	0.0	0.8	0.2	3.6	2.1	0.0	1.2	2.7	2.2	0.0	
ConA	1.7	1.1	1.8	1.8	1.7	0.5	3.8	1.3	1.3	4.1	3.3	3.5	2.3	2.8	8.8	2.7	0.0	
GNA	0.0	1.1	0.7	0.0	0.9	0.0	1.3	0.0	0.5	0.4	3.6	0.0	0.0	1.2	2.7	1.6	0.0	
HHL	1.4	2.2	0.7	1.1	1.2	0.8	0.0	0.0	0.5	0.6	2.6	1.4	0.0	1.2	2.7	1.6	0.0	
BPL	38.4	40.1	57.9	57.9	22.0	31.8	112.7	87.7	49.9	48.2	67.3	64.5	53.4	63.2	44.2	35.2	62.6	
TJA-II	27.7	31.2	41.0	60.0	14.9	39.7	101.3	75.5	28.2	22.3	98.0	70.2	42.4	67.2	63.9	28.0	116.8	
EEL	1.4	1.1	1.1	1.1	1.4	1.9	15.2	0.0	0.8	4.9	15.0	5.0	0.4	4.8	10.9	3.8	0.0	
ABA	49.1	55.8	65.8	65.7	47.5	46.5	24.1	61.3	49.6	72.0	28.8	51.8	41.2	54.0	44.2	49.5	30.9	
LEL	90.0	59.1	82.9	113.9	32.2	90.5	138.0	183.2	83.4	98.4	83.7	69.5	100.4	80.4	85.0	52.7	64.4	
STL	85.8	63.3	71.4	115.0	30.0	68.2	341.8	161.3	67.3	84.3	87.6	81.6	93.5	89.2	78.9	52.2	111.0	
UDA	8.7	0.3	1.4	1.8	1.4	0.8	12.7	7.7	4.0	2.1	8.5	9.2	3.1	11.6	8.8	10.4	5.2	
PWM	0.0	0.6	1.1	2.5	1.2	0.0	1.3	2.6	1.8	1.0	2.6	1.4	0.0	1.2	2.7	3.3	0.0	
Jacalin	94.5	76.0	79.5	93.6	81.8	60.6	62.0	81.9	65.7	81.2	96.1	94.3	76.0	97.2	117.0	84.1	68.1	
PNA	0.7	0.6	2.0	0.0	2.1	0.8	5.1	0.0	2.3	1.7	2.9	1.4	0.0	1.2	3.4	1.1	0.0	
WFA	21.8	22.1	34.7	76.1	22.7	14.1	79.7	48.4	20.4	50.7	45.8	50.4	31.7	50.0	38.0	19.0	47.1	
ACA	37.4	30.9	42.3	48.2	38.8	39.7	34.2	45.2	37.8	44.1	36.9	35.5	29.8	37.6	44.2	36.3	23.0	
MPA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
HPA	28.7	16.0	35.1	81.4	6.4	24.7	11.4	0.0	18.9	2.1	45.4	8.5	1.1	10.0	11.6	19.8	55.0	
VVA	0.0	0.0	0.7	1.4	0.9	0.3	5.1	0.0	1.3	0.8	2.3	0.7	0.0	1.2	2.7	0.0	0.0	
DBA	1.7	3.3	5.2	75.7	3.1	4.1	7.6	1.9	3.3	1.4	4.2	2.8	0.0	3.6	3.4	4.4	6.3	
SBA	2.8	4.7	4.3	31.1	4.3	0.5	3.8	1.9	3.8	1.6	23.2	9.2	2.7	11.6	4.8	4.4	26.7	
GSL-I	7.6	0.3	2.5	31.4	0.9	0.3	15.2	0.0	2.8	1.7	12.7	6.4	0.0	8.0	8.8	6.0	6.1	
PTL-I	0.0	0.0	0.9	1.8	0.7	0.0	5.1	0.0	1.0	0.0	1.0	0.7	0.0	1.2	2.0	1.6	0.0	
MAH	13.1	9.9	16.4	15.7	8.0	4.3	29.1	31.6	14.9	15.7	35.3	15.6	14.9	16.4	30.6	18.7	20.7	
WGA	124.6	98.3	81.3	92.9	88.7	88.6	230.4	191.6	107.6	65.4	142.8	159.6	128.6	151.6	191.2	141.0	130.4	
GSL-IA4	2.4	0.8	4.5	44.3	1.4	1.1	7.6	0.0	3.0	1.9	2.6	1.4	0.0	2.0	4.1	2.7	0.9	
GSL-IB4	0.0	0.0	0.5	0.0	0.7	0.0	11.4	0.6	2.0	1.7	1.6	1.4	0.0	1.6	2.7	3.3	6.8	

Supplementary Table S4. Comparative lectin profiling of sialylated MUC1 between CC and hepatolithiasis patients in cohort 2.

Lectins	Mean Normalization*		MPA Normalization**		
	Median	CV value	Hepatolithiasis	CC	P value***
	($\pm$ SD)	(%)	Median ($\pm$ SD)	Median ($\pm$ SD)	(Benign vs CC)
LTL	0.9 (3.88)	413.5	0.0 (0.90)	0.0 (0.42)	ND
PSA	1.2 (4.35)	364.2	0.5 (1.16)	0.5 (0.69)	ND
LCA	0.7 (3.61)	467.0	0.6 (0.96)	0.5 (1.00)	ND
UEA-I	39.3 (49.34)	125.7	2.4 (7.42)	6.5 (17.66)	0.0038
AOL	7.8 (20.28)	261.5	0.5 (0.67)	0.9 (8.24)	ND
AAL	31.0 (37.45)	120.9	2.4 (4.60)	10.4 (11.65)	< 0.0001
MAL	24.1 (12.26)	50.8	4.4 (1.79)	5.9 (4.44)	0.0167
SNA	16.8 (9.76)	58.2	3.2 (1.70)	3.2 (1.62)	0.3987
SSA	12.5 (10.77)	86.0	3.0 (1.85)	3.8 (3.09)	ND
TJA-I	4.9 (7.36)	148.8	1.7 (1.47)	1.0 (1.06)	ND
PHA-L	1.0 (3.66)	364.4	0.5 (0.66)	0.9 (1.32)	ND
ECA	6.4 (7.79)	122.4	1.2 (1.03)	2.5 (2.24)	ND
RCA120	103.9 (35.33)	34.0	18.6 (7.74)	20.0 (11.21)	0.7181
PHA-E	5.4 (11.30)	209.1	1.7 (1.45)	1.3 (2.34)	ND
DSA	46.8 (24.69)	52.8	8.0 (4.86)	8.8 (6.89)	0.7962
GSL-II	0.8 (4.50)	584.5	0.0 (1.42)	0.3 (1.19)	ND
NPA	1.2 (4.92)	407.2	0.0 (1.15)	0.0 (1.27)	ND
ConA	5.3 (8.34)	166.1	2.0 (2.29)	1.8 (1.31)	ND
GNA	1.4 (4.97)	360.7	0.1 (1.44)	0.3 (1.02)	ND
HHL	2.4 (5.83)	242.1	0.5 (1.35)	0.7 (1.05)	ND
BPL	209.8 (60.53)	28.9	40.2 (13.37)	51.5 (20.53)	0.0014
TJA-II	183.2 (63.61)	34.7	37.8 (15.27)	41.4 (26.75)	0.2371
EEL	13.1 (18.87)	144.5	2.0 (3.52)	1.4 (4.46)	ND
ABA	276.6 (70.42)	25.5	49.2 (7.53)	49.5 (15.33)	0.504
LEL	436.0 (135.61)	31.1	65.2 (24.72)	83.7 (79.99)	0.0147
STL	430.0 (118.75)	27.6	64.0 (22.14)	81.6 (62.99)	0.0067
UDA	17.6 (19.73)	112.4	3.0 (4.25)	5.2 (3.75)	ND
PWM	1.6 (4.32)	271.0	0.4 (1.10)	1.2 (0.94)	ND
Jacalin	464.9 (83.49)	18.2	87.2 (12.30)	83.4 (11.12)	0.072
PNA	3.8 (7.06)	187.0	0.4 (1.49)	1.2 (1.55)	ND
WFA	133.5 (56.14)	42.0	20.3 (10.8)	33.3 (21.54)	< 0.0001
ACA	195.4 (38.58)	19.7	34.1 (5.34)	37.4 (6.26)	0.0382
MPA	554.6 (100.94)	18.0	-	-	-
HPA	70.0 (82.51)	117.9	19.0 (15.17)	10.7 (22.18)	0.2215
VVA	1.0 (3.32)	347.3	0.2 (0.93)	0.7 (1.28)	ND
DBA	11.6 (25.96)	223.1	2.1 (2.62)	2.8 (15.4)	ND
SBA	12.5 (17.43)	139.4	2.0 (3.19)	4.4 (7.49)	ND
GSL-II	10.4 (14.86)	142.7	2.0 (2.23)	2.5 (7.53)	ND
PTL-I	0.6 (2.67)	482.2	0.0 (0.89)	0.6 (1.24)	ND
MAH	83.8 (23.84)	28.5	15.1 (4.81)	15.6 (10.21)	0.8326
WGA	857.0 (229.12)	26.7	156.5 (40.05)	128.4 (42.17)	0.0006
GSL-IA4	7.9 (16.67)	211.5	2.3 (1.72)	1.9 (9.02)	ND
GSL-IB4	2.0 (5.38)	269.8	0.5 (1.27)	0.9 (2.53)	ND

*The values are presented as the median after mean-normalization.

**The values are presented as the median after MPA-normalization.

***Mann-Whitney U test was used. ND, not determined.

Supplementary Table S5. Comparison of WFA-sialylated MUC1 and other markers in plasma from *O. viverrini*-positive CC and opisthorchiasis patients in cohort 1.

Cohort 1	CC (range)	Opisthorchiasis (range)	<i>p</i> -value	Odds ratio
(plasma)	(<i>n</i> = 78)	(<i>n</i> = 78)	(univariate)	(95% CI) (multivariate)
Sex (M/F)	23/55	23/55		
Age (y)	56 ± 8.25 (57–90)	54 ± 10.42 (32–73)	0.7149	NS
CA19-9 (U/mL)	417.8 ± 862.2 (0–2623)	6.8 ± 11.4 (0–54.7)	< 0.0001	1.003 (1.001–1.005)
Total bilirubin (mg/dL)	6.25 ± 14.10 (0.40–50.30)	0.7 ± 0.24 (0.40–1.70)	< 0.0001	1.022 (1.006–1.038)
α-Fetoprotein (ng/mL)	2.96 ± 41.33 (0.70–291.73)	2.48 ± 2.65 (0.39–19.84)	0.0119	NS
AST (U/L)	70 ± 72.65 (18–353)	28 ± 24.39 (17–182)	< 0.0001	NS
ALT (U/L)	48 ± 62.22 (10–354)	24 ± 25.50 (6–197)	< 0.0001	NS
Albumin (g/dL)	3.7 ± 0.65 (2.0–4.9)	4.2 ± 0.29 (2.9–4.7)	< 0.0001	NS
WFA-sialylated MUC1	0.656 ± 0.681 (0.051–2.651)	0.188 ± 0.239 (0–0.761)	< 0.0001	1.047 (1.022–1.072)

CC, cholangiocarcinoma; CI, confidence interval; AST, aspartate transaminase; ALT, alanine transaminase; WFA, *Wisteria floribunda* agglutinin; NS, not significant.

Supplementary Table S6. Comparison of WFA-sialylated MUC1 and other markers in serum from CC and hepatolithiasis patients in cohort 2.

Cohort 2 (serum)	CC (range) (<i>n</i> = 33)	Hepatolithiasis (range) (<i>n</i> = 40)	<i>p</i> -value (univariate)	Odds ratio (95% CI) (multivariate)
Sex (M/F)	20/13	19/21		
Age (y)	77 ± 8.25 (57–90)	76 ± 9.50 (56–93)	0.6692	NS
CA19-9 (U/mL)	69.6 ± 506.7 (0–1200)	6 ± 140.6 (0–858.3)	0.0002	1.003 (1.001–1.006)
CYFRA21-1 (ng/mL)	1.7 ± 54.72 (0–208.6)	0 ± 2.50 (0–15.76)	0.0022	NS
CA 242 (U/mL)	7.5 ± 104.13 (0–405.0)	3.75 ± 4.34 (0–25.6)	0.004	NS
Total bilirubin (mg/dL)	0.90 ± 6.73 (0.50–26.60)	0.66 ± 1.63 (0.22–8.85)	0.002	NS
Location				
Intrahepatic	28/33 (85%)			
Perihilar	1/33 (3%)			
Extrahepatic	4/33 (12%)			
WFA-sialylated MUC1	0.900 ± 0.915 (0.15–3.95)	0.505 ± 0.341 (0.08–1.19)	0.0002	1.018 (1.005–1.031)

CC, cholangiocarcinoma; CI, confidence interval; WFA, *Wisteria floribunda* agglutinin; NS, not significant.

Supplementary Table S7. Measured values of WFA-MY.1E12 ELISA and CA19-9 in 78 CC patients in Thailand (cohort 1)

Patient No.	WFA-MY (OD)	CA 19-9 (U/ml)
1	0.53	7
2	0.22	1000
3	1.42	11
4	2.01	135
5	0.46	202
6	0.97	ND
7	1.60	83
8	0.41	56
9	0.57	237
10	1.12	852
11	2.60	ND
12	0.37	105
13	1.53	75
14	0.32	ND
15	0.17	1000
16	0.98	756
17	0.97	1000
18	0.72	1000
19	1.72	54
20	0.56	27
21	2.61	ND
22	0.67	95
23	1.75	1865
24	0.76	1591.3
25	2.65	ND
26	2.10	1865
27	0.67	399.3
28	0.88	1865
29	0.60	106.9
30	0.81	72.5
31	0.98	243.4
32	0.19	60.4
33	0.24	1721.9
34	0.66	852.5
35	0.61	ND
36	1.40	1865
37	0.31	1865
38	0.64	1865
39	0.67	ND
40	0.28	6
41	1.45	1865
42	2.04	188
43	1.37	1865
44	0.24	1865
45	2.27	1865
46	0.47	ND
47	0.08	83.6
48	1.45	436.3
49	0.31	1865
50	0.41	1865
51	0.71	1865
52	0.52	1869
53	1.00	1869
54	0.65	1869
55	0.88	548.6
56	0.57	94
57	1.54	36.6
58	1.10	2623
59	0.32	1902
60	0.37	1902
61	0.95	1902
62	0.05	33
63	1.77	9.2
64	0.20	1902
65	1.55	1902
66	0.72	1902
67	0.22	1902
68	2.39	196.8
69	0.14	1902
70	0.48	1902
71	0.19	1902
72	0.49	1902
73	0.25	5.7
74	0.07	288.7
75	0.15	ND
76	0.23	18.5
77	0.10	ND
78	0.48	ND

*Bold indicates the values higher than the cut-off value (0.36)

ND, Not determined (<1 U/mL)

Supplementary Table S8. Measured values of WFA-MY.1E12 ELISA and CA19-9 in 33 CC patients in Japan (cohort 2)

S-22

Patient No.	WFA-MY (OD)	CA19-9 (U/mL)
1	2.18*	1200
2	0.96	220.5
3	0.45	1200
4	2.94	ND
5	2.63	240
6	0.46	ND
7	1.97	1200
8	1.78	7
9	0.58	14
10	1.59	5.8
11	1.15	40.8
12	2.62	120.9
13	0.49	87.3
14	1.53	951
15	1.65	50.9
16	0.99	571.2
17	2.44	14
18	3.29	1200
19	1.25	21.6
20	1.48	ND
21	1.62	603.9
22	1.22	139
23	1.40	69.6
24	1.12	1176
25	2.93	1200
26	1.51	66.9
27	1.02	1200
28	0.81	1200
29	0.95	ND
30	0.84	37.8
31	0.42	ND
32	1.67	5.8
33	0.99	11.5

*Bold indicates the values higher than the cut-off value (0.80)

ND, Not determined (< 1 U/mL)