

Supplementary Information:

Microbial Glycan Microarrays Define Key Features of Host-Microbial Interactions

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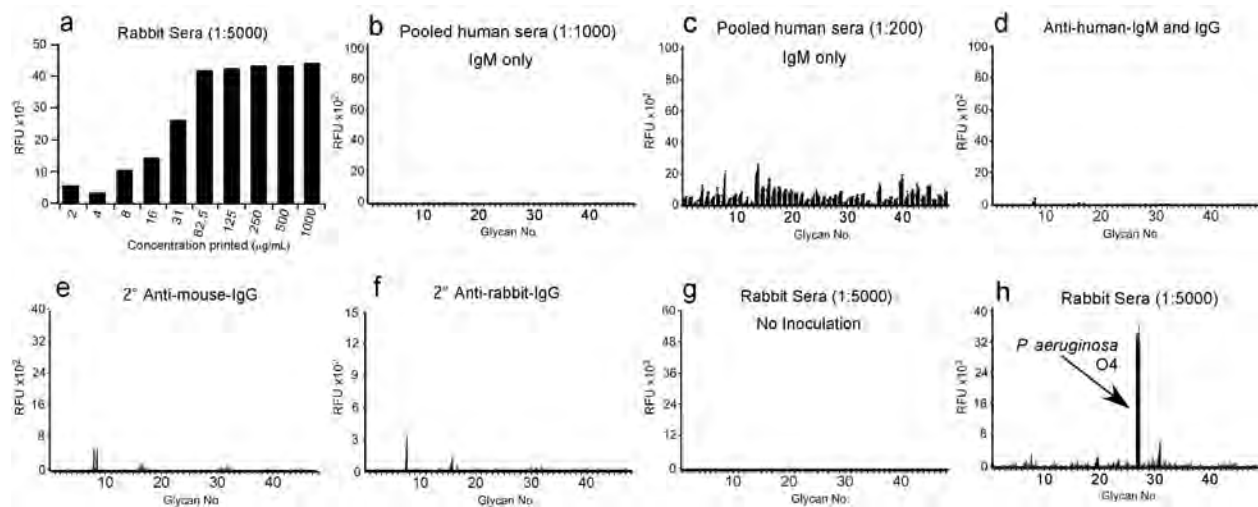
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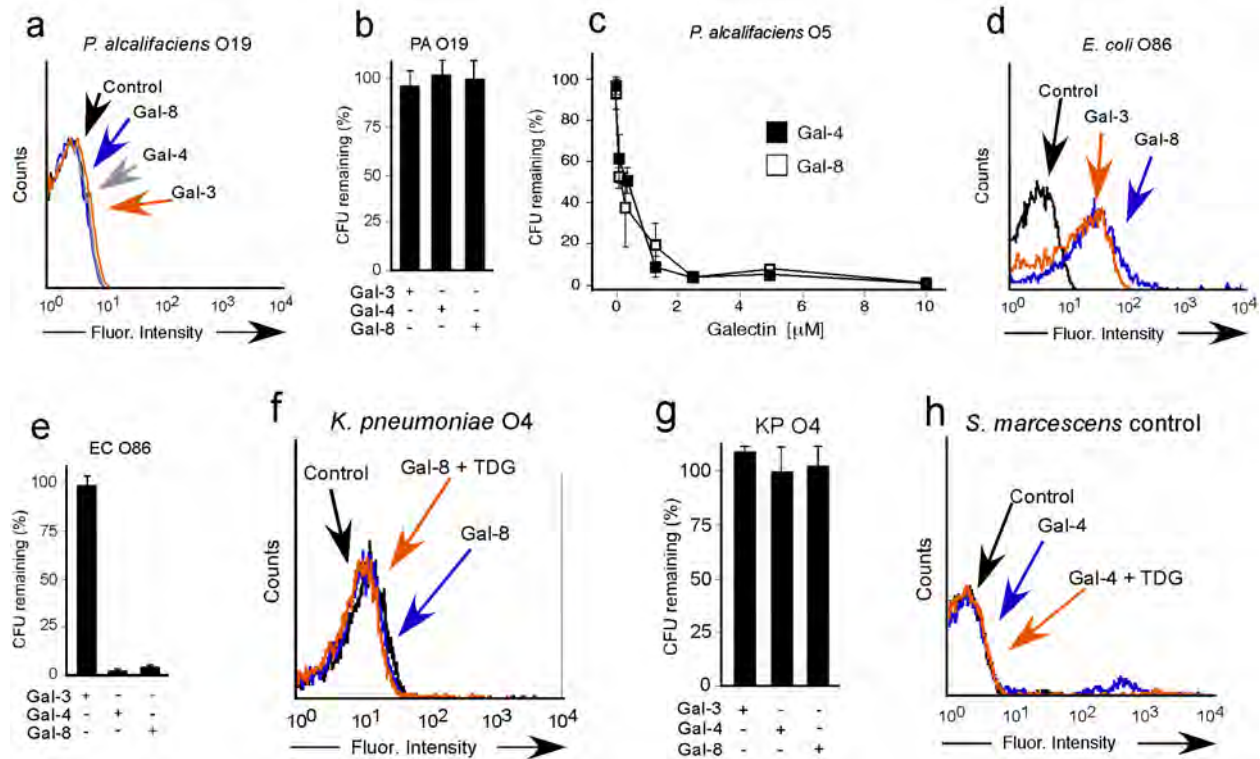
Supplementary Results:

Supplementary Figure 1



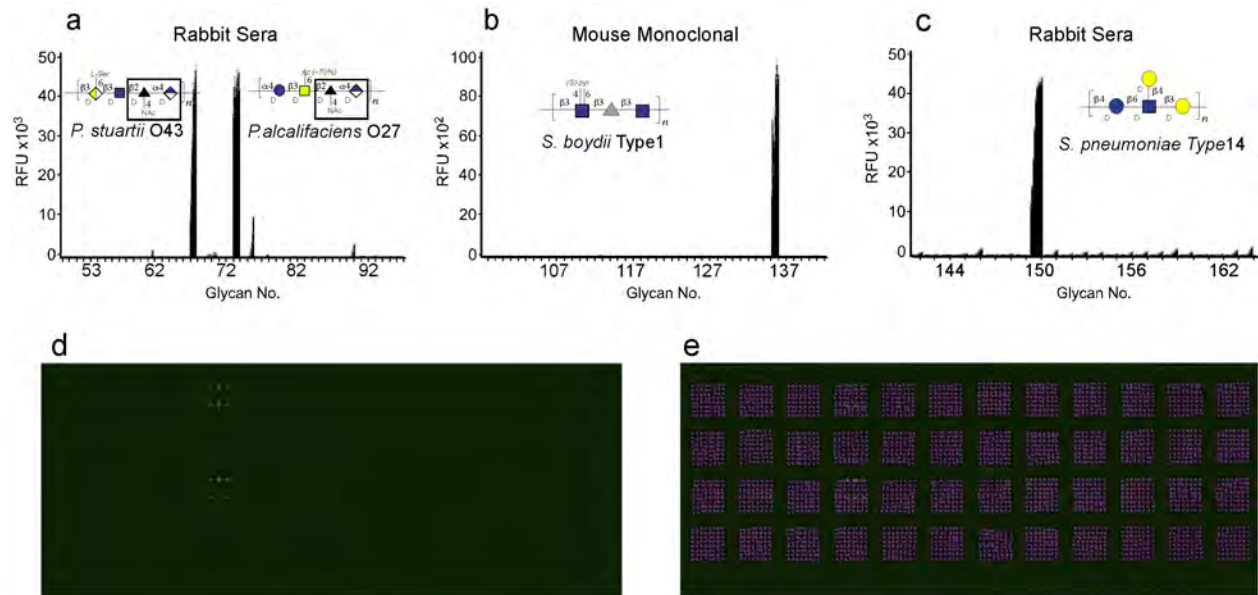
Supplementary Figure 1. Recognition of microbial glycan structures by sera. (a) Anti-*Pseudomonas aeruginosa* O2 serum interrogation of printed *P. aeruginosa* O2a O-antigen. Graph represents hybridization of standard protocol printing on Codelink glass slide (GE Healthcare) with antigens printed at 2 $\mu\text{g/mL}$ to 1 mg/mL. (b-h) MGMv1 data obtained after incubation with pooled normal human sera at 1:1000 followed by anti-IgM alone (b), pooled normal human sera at 1:200 followed by labeled anti-IgM (c), anti-human IgG and anti-human IgM alone (d), anti-mouse IgG alone (e), anti-rabbit IgG alone (f), 1:5000 dilution of normal rabbit sera (g), or sera from rabbits challenged with the indicated bacterial species followed by detection with anti-rabbit IgG (h). See **Supplementary Dataset 1** for complete microarray data.

Supplementary Figure 2



Supplementary Figure 2. Bacterial targets for galectin binding and killing require self like antigen. (a) Flow cytometric analysis of *P. alcalifaciens* O19 (PA O19) after incubation with Gal-3, Gal-4, or Gal-8 at ~0.1 μM. (b) Quantification of PA O19 after addition of 5 μM Gal-3, Gal-4, or Gal-8. (c) Quantification of PA O5 after addition of the indicated concentrations of Gal-4 and Gal-8. (d) Flow cytometric analysis of *E. coli* O86 (EC O86) after incubation with Gal-3 and Gal-8 at ~0.1 μM. (e) Quantification of EC O86 after addition of 5 μM Gal-3, Gal-4, or Gal-8. (f) Flow cytometric analysis of *K. pneumoniae* O4 (KP O4) after incubation with ~0.1 μM Gal-8 with or without inclusion of 20 mM TDG. (g) Quantification of KP O4 after addition of 5 μM Gal-3, Gal-4, or Gal-8 (n=2 in 1 representative experiment of 2-3). (h) Flow cytometric analysis of SM control strain after incubation with ~0.1 μM Gal-4 with or without inclusion of 20 mM TDG. Viable bacteria were quantified by dilution plating, n = 2-3 in 1 representative experiment of 3; error bars represent means ± 1 s.d.

Supplementary Figure 3



Supplementary Figure 3. Antibody detection of specific immobilized microbial antigens.

MGM data obtained after incubation with sera from rabbits or mice challenged with *Providencia alcalifaciens* O27 (a), *Shigella boydii* Type1 (b) or *Streptococcus pneumoniae* Type14 (c). Antigens printed at 0.5mg/mL and hybridized with anti-sera diluted 1:5000 or 10 μ g/mL of monoclonal antibody. Symbol nomenclature illustrates the facile identification of the common - β 2-QuiNAc- α 4-GlcA- epitope of *P. stuartii* O43 (#67) and *P. alcalifaciens* O27 (#73). (d-e) Representative slide images obtained following incubation with sera from rabbits challenged with *Providencia alcalifaciens* O19 without the overlay grid (d) or with the overlay grid (e) used to assign the fluorescent signal obtained to each printed glycan. See **Supplementary Dataset 3** for complete microarray data.

Supplementary Figure 4

Mammalian structure	Microbial structure
<p>Blood group B</p>	<p><i>E. coli</i> O86</p>
<p>Blood group H</p>	<p><i>E. coli</i> O128</p>
<p>Sia α LacNAc</p>	<p><i>S. agalactiae</i> A909</p>
<p>α Gal LacNAc</p>	<p><i>P. alcalifaciens</i> O5</p>
<p>α Gal</p>	<p><i>K. pneumoniae</i> O1 <i>S. marcescens</i> O20 <i>E. coli</i> O55</p>
<p>β Gal</p>	<p><i>H. influenzae</i> 2019 <i>S. pneumoniae</i> 70</p>
<p>Glycosaminoglycans (GAG)</p>	<p><i>P. alcalifaciens</i> O6 <i>P. vulgaris</i> O45</p>
<p>N/A</p>	<p><i>P. alcalifaciens</i> O19 <i>K. pneumoniae</i> O4</p>

Supplementary Figure 4. Schematic representation of mammalian and microbial carbohydrate determinants. Structures of commonly occurring mammalian glycans are shown as indicated with corresponding structures synthesized by the indicated microbial species. Symbol nomenclature is shown in **Supplementary Figures 5 and 6.**

Supplementary Figure 5

Expanded Carbohydrate Symbol Nomenclature

Hexoses: All NAc's and amines are in the two position.

Glucose		GlcNAc		GlcN		GlcA	
Galactose		GalNAc		GalN		GalA	
Mannose		ManNAc		ManN		ManA	
Idose		IdoNAc		IdoN		IdoA	
Gulose		GulNAc		GulN		GulA	
Altrose		AltNAc		AltN		AltA	
Talose		TalNAc		TalN		TalA	
Allose		AlfNAc		AlfN		AlfA	

6-Deoxy Sugars: All NAc's and amines are in the two position.

Fucose		FucNAc		FucN	
Quinovose		QuiNAc		QuiN	
Rhamnose		RhaNAc		RhaN	

3,6-Di-deoxy Sugars

Colitose		Tyvelose	
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Pentoses

Ribose		Fructose	
Arabinose		Sorbose	
Xylose		Psicose	
Lyxose		Tagatose	

Ketoses

Sialic Acids:

Neu5Ac	
Neu5Gc	
KDN	

Ulosonic acids:

Pseudaminic acid	
Legionaminic acid	
8-Epi-legionaminic acid	
4-Epi-legionaminic acid	

Other:

KDO	
KO	
Heptose	

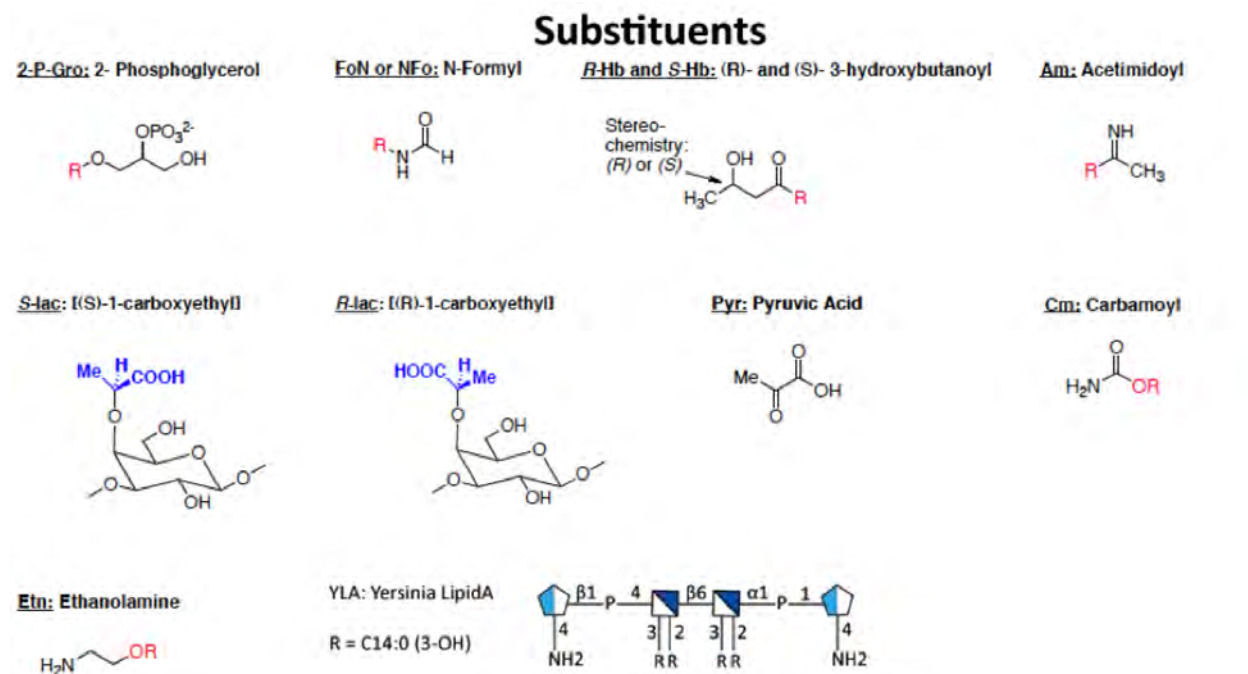
All Hexoses are, by default, in the pyranose form, D-Configuration

All 6-deoxy sugars are in pyranose, L-configuration
If clarification is needed, do as below:

Sugar is in furanose form: (Draw inside sugar)	<i>f</i>	Example:	
Hexose is in L-form: (Draw to bottom-left of sugar)	<i>L</i>	Example:	
6-Deoxy is in D-form: (Draw to bottom-left of sugar)	<i>D</i>	Example:	

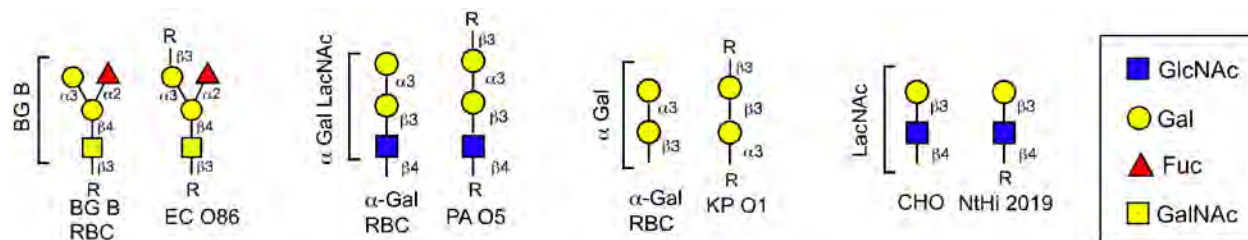
Supplementary Figure 5. Extended symbol nomenclature for bacterial glycans. Shown is a symbol nomenclature developed by the CFG for notation of bacterial polysaccharides. It is based on the existing nomenclature adopted by the CFG and the textbook, *Essentials of Glycobiology* for representation of mammalian glycans. In order to accommodate the diversity of bacterial glycans present in O-antigens, it was necessary to add an additional 39 symbols with a total of 71 unique carbohydrates are represented. This nomenclature is viewed as a draft symbol nomenclature for representation of diverse microbial glycans. However, it is useful to visually identify common epitopes recognized by antibodies/antisera in glycans from different species (e.g. see **Supplementary Figure 4**).

Supplementary Figure 6



Supplementary Figure 6. Additional substituents for bacterial glycans. Additional substituents of bacterial antigenic structures depicted in **Supplementary Figure 4** or in **Supplementary Table 1** are defined. This is additional to symbol nomenclature developed by the CFG for notation of bacterial polysaccharides.

Supplementary Figure 7



Supplementary Figure 7. Carbohydrate determinants on eukaryotic cells vs. targeted bacterial strains. Schematic representation of self-like antigens targeted by galectins on various microbes, paired with similar structures found on indicated eukaryotic cells. BG B = blood group B.

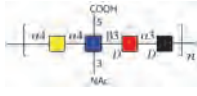
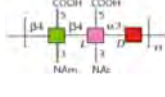
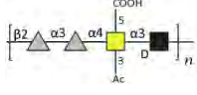
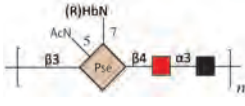
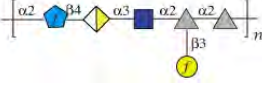
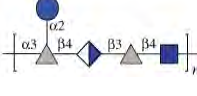
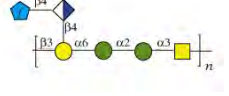
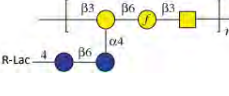
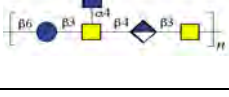
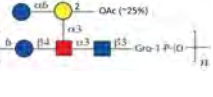
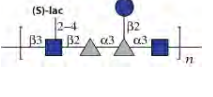
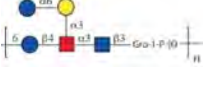
Supplementary Data 1. Excel files containing data obtained following analysis of binding on the MGMv1.

Supplementary Data 2. Excel files containing data obtained following analysis of binding on the mammalian glycan microarray.

Supplementary Data 3. Excel files containing data obtained following analysis of binding on the expanded MGM.

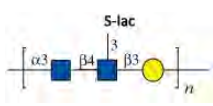
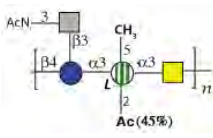
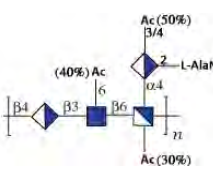
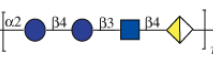
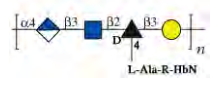
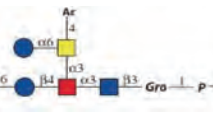
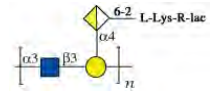
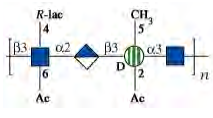
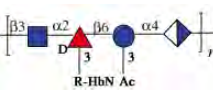
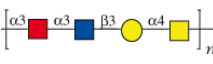
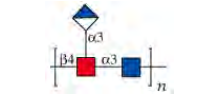
Supplementary Table 1. Bacterial species represented on the MGM. The published names and a partial list of structures are shown for bacterial species included on the MGM. References for each of the shown structure are included with this table. The first 48 structures listed are those included on the original MGM as indicated by the table legend. A more detailed source of microbial glycan determinants can be found at <http://csdb.glycoscience.ru/bacterial/>

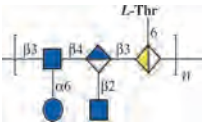
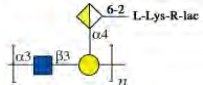

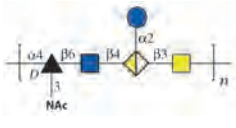
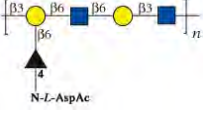
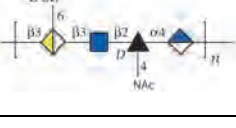
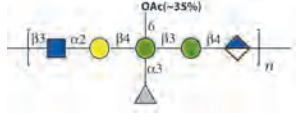
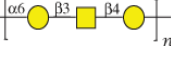
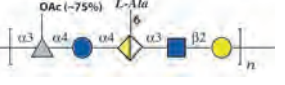
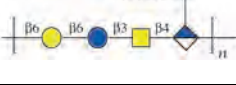
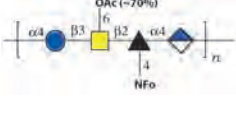
Supplementary Table 1

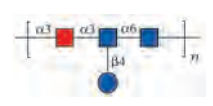
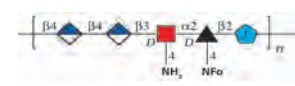
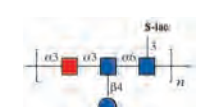
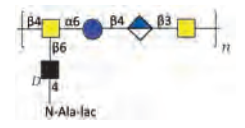
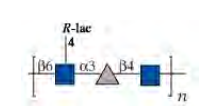
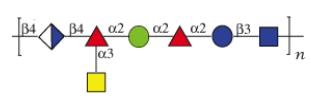
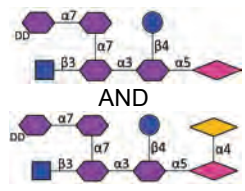
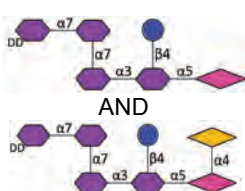
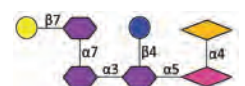
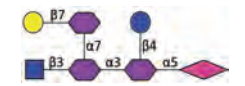
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2	<i>Pseudomonas</i>	<i>aeruginosa</i>	O2a, 2c	IATS2-FI 3		(1)
3	<i>Pseudomonas</i>	<i>aeruginosa</i>	O13a, 13b	IATS13, Sandvik serotype II		(1)
4	<i>Pseudomonas</i>	<i>aeruginosa</i>	O9a, 9d			(2)
5	<i>Shigella</i>	<i>boydii</i>	type2			(3)
6	<i>Shigella</i>	<i>boydii</i>	type4			(4, 5)
7	<i>Shigella</i>	<i>boydii</i>	type10			(6)
8	<i>Shigella</i>	<i>dysenteriae</i>	type3			(7)
9	<i>Shigella</i>	<i>dysenteriae</i>	type8			(5)
10	<i>Shigella</i>	<i>dysenteriae</i>	type11			(8, 9)
11	<i>Shigella</i>	<i>dysenteriae</i>	type13			(6, 10)
12	<i>Escherichia</i>	<i>coli</i>	O29:H10			(7)


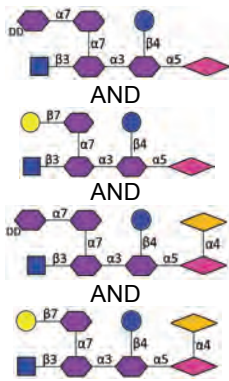
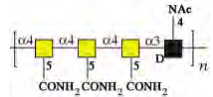
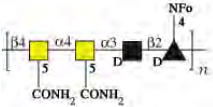
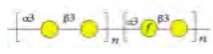
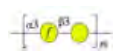


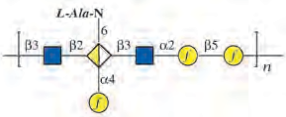
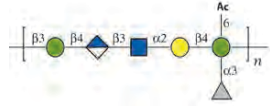
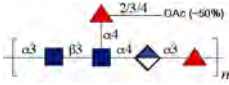
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14	Escherichia	coli	O106			(12)(12)
15	Escherichia	coli	O130			(13)
16	Escherichia	coli	O148			(14)
17	Escherichia	coli	O150:H6			(15)
18	Escherichia	coli	O180			(6, 10)
19	Proteus	mirabilis	O3a, 3c	G1		(16)
20	Proteus	mirabilis	O8	TG326		(17)
21	Proteus	mirabilis	O10	HJ4320		(18)
22	Proteus	mirabilis	O29a, 29b			(19)
23	Proteus	mirabilis	O50	TG332		(20)
24	Proteus	mirabilis	O54a, 54b			(21)
25	Pseudomonas	aeruginosa	O2a, 2b	IATS16		(1)
26	Pseudomonas	aeruginosa	O2a, 2b, 2e			(1)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
27	Pseudomonas	aeruginosa	O2a, 2d	IATS5		(1)
28	Pseudomonas	aeruginosa	O2	FI 7		(1)
29	Pseudomonas	aeruginosa	O3a, 3b			(1)
30	Pseudomonas	aeruginosa	O3a, 3b, 3c	IATS3		(1)
31	Pseudomonas	aeruginosa	O3a, 3d			(1)
32	Pseudomonas	aeruginosa	O4a, 4c			(1)
33	Pseudomonas	aeruginosa	O6a	IATS6		(1)
34	Pseudomonas	aeruginosa	O6a, 6c			(1)
35	Pseudomonas	aeruginosa	O6	FI 1		(1)
36	Pseudomonas	aeruginosa	O10a, 10b	IATS10-FI5		(1)
37	Pseudomonas	aeruginosa	O10a, 10c	IATS19		(1)
38	Pseudomonas	aeruginosa	O11a, 11b	IATS11-FI2		(1)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
51	Proteus	penneri	O64a, 64b, 64c			(30)
52	Proteus	penneri	O66	2		(31)
53	Proteus	penneri	O69			(32)
54	Proteus	penneri	O71	42		(33)
55	Proteus	vulgaris	O4	PrK 9/57		(34)
56	Proteus	vulgaris	O12	PrK 25/57		(35)
57	Proteus	vulgaris	O13	8344		(36)
58	Proteus	vulgaris	O15	PrK 30/57		(37)
59	Proteus	vulgaris	O17	PrK 33/57		(32)
60	Proteus	vulgaris	O19a	PrK 37/57		(38)
61	Proteus	mirabilis	O6	PrK 14/57		(39)

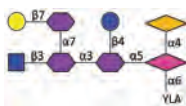
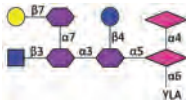
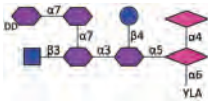
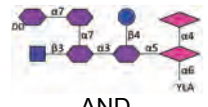
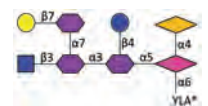
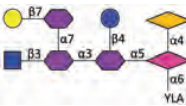
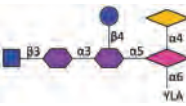
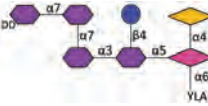
BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
62	Proteus	mirabilis	O11	PrK 24/57		(40)
63	Proteus	mirabilis	O13	PrK 26/57		(36)
64	Proteus	myxofaciens	O60			(21)
65	Proteus	genomospecies	O56			(41)
66	Providencia	stuartii	O4			(42)
67	Providencia	stuartii	O43			(43)
68	Providencia	stuartii	O47			(44)
69	Providencia	stuartii	O47 (Core9)			(44)
70	Providencia	stuartii	O49			(45)
71	Providencia	stuartii	O57			(44)
72	Providencia	alcalifaciens	O23			(27, 46)
73	Providencia	alcalifaciens	O27			(43)

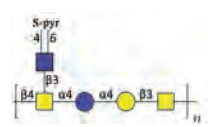
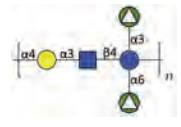


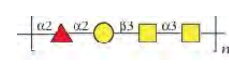
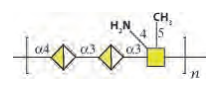
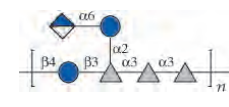
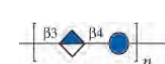
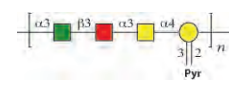
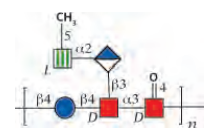
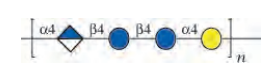

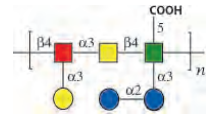
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74	Providencia	alcalifaciens	O29			(47)
75	Providencia	alcalifaciens	O30			(48)
76	Providencia	alcalifaciens	O32			(49)
77	Providencia	alcalifaciens	O39			(8)
78	Providencia	rustigianni	O16			(49)
79	Providencia	rustigianni	O34			(50)
80*	Yersinia	pestis	KM260-ΔO187			(51)
81*	Yersinia	pestis	KM260-Δrfe			(6, 10)
82*	Yersinia	pestis	1146-25			(52)
83*	Yersinia	pestis	1146-37			(52)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
84*	Yersinia	pestis	KM218-37			(52)
85*	Yersinia	pestis	KM260-25			(52)
86	Francisella	novicida				(53)
87	Francisella	tularensis				(54)
88	Klebsiella	pneumoniae	O1			(55)
89	Klebsiella	pneumoniae	O2a			(55)
90	Klebsiella	pneumoniae	O2a,2c			(55)
91	Klebsiella	pneumoniae	O4			(55)
92	Shigella	boydii	Type3			(6, 9)
93	Shigella	boydii	Type5			(56)
94	Shigella	dysenteriae	Type4			(57)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
95	Shigella	dysenteriae	Type5			(5)
96	Shigella	dysenteriae	Type6			(5)
97*	Salmonella	typhimurium	SL 1181			(58)
98*	Salmonella	typhimurium	TV 119			(59)
99*	Salmonella	typhimurium	SL 684			(59)
100	Salmonella	typhimurium				(60)
101	Serratia	marcescens	Bizio			(61)
102	Escherichia	coli	K235			(62)
103	Escherichia	coli	O128-B12			(63)
104	Salmonella	enterica abortus equi				(64)
105	Salmonella	typhosa		ATCC - 10749		(65)
106	Salmonella	enteritidis		ATCC - 13076		(66)
107	Proteus	vulgaris	O1	18984		(67)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
108	Proteus	vulgaris	O21	PrK 39/57		(68)
109	Proteus	vulgaris	O34	4669		(69)
110	Proteus	mirabilis	O51	19011		(70)
111	Providencia	stuartii	O20			(71)
112	Providencia	alcalifaciens	O6			(72)
113	Providencia	alcalifaciens	O19	LPS		(25)
114	Providencia	alcalifaciens	O19	LPS-NaOH		(25)
115	Providencia	alcalifaciens	O36			(73)
116*	Yersinia	pestis	KM260-ΔO187	LPS		(10)
117*	Yersinia	pestis	KM260-Δrfe	LPS		(6, 10)

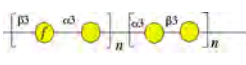
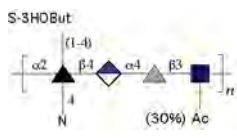
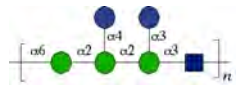
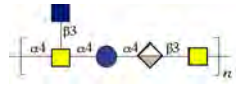
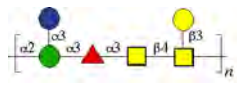
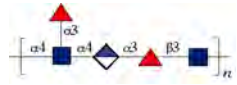
BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
118*	Yersinia	pestis	1146-25	LPS		(52)
119*	Yersinia	pestis	1146-37	LPS		(52)
120*	Yersinia	pestis	KM218-37	LPS		(74)
121*	Yersinia	pestis	KM218-25			(52)
122*	Yersinia	pestis	KM260 (11)- Δ pmrF			(10)
123*	Yersinia	pestis	KM260 (11)- Δ 0186			(6, 10)
124*	Yersinia	pestis	KM260 (11)- Δ waaQ			(6, 10)
125*	Yersinia	pestis	KM260 (11)- Δ waaL			(6, 10)

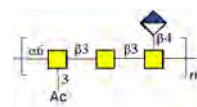
BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
137	Shigella	dysenteriae	Type2			(77)
138	Escherichia	coli	O111:B4			(59)
139	Escherichia	coli	O26:B6			(63)
140	Escherichia	coli	O55:B5			(78)
141	Escherichia	coli	O127:B8			(63)
142	Streptococcus	pneumoniae	1			(79)
143	Streptococcus	pneumoniae	2			(80, 81)
144	Streptococcus	pneumoniae	3			(82)
145	Streptococcus	pneumoniae	4			(83)
146	Streptococcus	pneumoniae	5			(84)
147	Streptococcus	pneumoniae	8			(85, 86)
148	Streptococcus	pneumoniae	9			(87)
149	Streptococcus	pneumoniae	12			(88, 89)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
150	Streptococcus	pneumoniae	14			(81, 90)
151	Streptococcus	pneumoniae	17			(91, 92)
152	Streptococcus	pneumoniae	19			(93)
153	Streptococcus	pneumoniae	20			(94, 95)
154	Streptococcus	pneumoniae	22			(96)
155	Streptococcus	pneumoniae	23			(97)
156	Streptococcus	pneumoniae	26			(81)
157	Streptococcus	pneumoniae	34			(98)
158	Streptococcus	pneumoniae	43			(85, 99)
159	Streptococcus	pneumoniae	51			(85)
160	Streptococcus	pneumoniae	54			(100)
161	Streptococcus	pneumoniae	56			(81, 101)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
162	Streptococcus	pneumoniae	57			(85)
163	Streptococcus	pneumoniae	68			(102)
164	Streptococcus	pneumoniae	70			(103)
165	Providencia	stuartii	O49	Core Linked		(45)
166	Providencia	stuartii	O52			(104)
167	Pseudomonas	aeruginosa	O4 (Habs serotype 4)	(Habs serotype 4)		(105)
168	Pseudomonas	aeruginosa	O6a (Habs serotype 6, fraction IIa)			(1)
169	Pseudomonas	aeruginosa	O6a (Habs serotype 6, fraction IIb)			(1)
170	Pseudomonas	aeruginosa	O10			(106)
171	Salmonella	typhimurium	dodeca saccharid e			(107)
172	Salmonella	enteritidis	dodeca saccharid e			(108)
173	Proteus	penneri	O72a, 72b (4)			(109)
174	Pseudomonas	aeruginosa	O2 (2a),2d,2f			(1)
175	Pseudomonas	aeruginosa	O7 7a,7b,7c			(1)
176	Pseudomonas	aeruginosa	O7 7a,7b,7d			(110)
177	Pseudomonas	aeruginosa	O7 7a,7d			(110)
178	Proteus	vulgaris	O22	(PrK 40/57)		(111)
179	Proteus	vulgaris	O25	(PrK 48/57)		(112)
180	Proteus	vulgaris	O37a,b	(PrK 63/57)		(113)
181	Proteus	vulgaris	O37a,c	(PrK 72/57)		(113)
182	Proteus	vulgaris	O44	(PrK 67/57)		(114)
183	Proteus	vulgaris	O45	(4680)		(115)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
184	Proteus	vulgaris	O53	(TG 276-10)		(109)
185	Proteus	vulgaris	O54a,54c	(TG 103)		(21)
186	Proteus	vulgaris	O55	(TG 155)		(109)
187	Proteus	vulgaris	O65	(TG 251)		(116)
188	Proteus	mirabilis	O14a,14b	(PrK 29/57)		(117)
189	Proteus	mirabilis	O16	(4652)		(118)
190	Proteus	mirabilis	O17	(PrK 32/57)		(119)
191	Proteus	mirabilis	O23a,b,d	(PrK 42/57)		(109)
192	Proteus	mirabilis	O26	(PrK 49/57)		(120)
193	Proteus	mirabilis	O27	(PrK 50/57)		(121)
194	Proteus	mirabilis	O28	(PrK 51/57)		(122)
195	Proteus	mirabilis	O29a	(PrK 52/57)		(109)
196	Proteus	mirabilis	O40	(10703)		(123)
197	Proteus	mirabilis	O41	(PrK 67/57)		(124)
198	Proteus	mirabilis	O74	(10705, OF)		(109)
199	Proteus	mirabilis	O75	(10702, OC)		(109)
200	Proteus	mirabilis	O77 (3 B-m)			(109)
201	Proteus	penneri	O31a (26)			(109)
202	Proteus	penneri	O52 (15)			(109)
203	Proteus	penneri	O58 (12)			(109)
204	Proteus	penneri	O59 (9)			(109)
205	Proteus	penneri	O61 (21)			(109)
206	Proteus	penneri	O62 (41)			(109)
207	Proteus	penneri	O63 (22)			(109)
208	Proteus	penneri	O64a,b,c (27)			(109)
209	Proteus	penneri	O65 (34)			(116)
210	Proteus	penneri	O67 (8)			(109)
211	Proteus	penneri	O68 (63)			(109)
212	Proteus	penneri	O70 (60)			(125)
213	Proteus	penneri	O73a,b (103)			(109)
214	Yersinia	pestis	KM218-25			(126)
215	Yersinia	pestis	KM260(11)- Δ pnrF			(127)
216	Yersinia	pestis	KM260(11)- Δ O186			(127)
217	Yersinia	pestis	KM260(11)- Δ waaQ			(127)
218	Yersinia	pestis	KM260(11)-37			(127)
219	Yersinia	pestis	KIMD1-37			
220	Yersinia	Pestis	KIMD1-25			
221	Proteus	mirabilis	O23a, 23b, 23c	(CCUG 10701)		(109)
222	Yersinia	pestis	260(11)-37C-417			(127)
223	Yersinia	pestis	P-1680-25C			
224	Yersinia	pestis	I-2377-25C			(128)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
225	Yersinia	pestis	I-2377-37C			(128)
226	Klebsiella	pneumoniae	O3	OPS		(55)
227	Klebsiella	pneumoniae	O5	OPS		(55)
228	Klebsiella	pneumoniae	O8	OPS		(110)
229	Klebsiella	pneumoniae	O12	OPS		(55)
230	Shigella	boydii	type 9			(129)
231	Shigella	boydii	type 11			(130)
232	Shigella	boydii	type 12			(110)
233	Shigella	boydii	type 15			(131)
234	Shigella	boydii	type 16			(131)
235	Shigella	boydii	type 17			(132)
236	Shigella	boydii	type 18			(133)
237	Escherichia	coli	O49			(134)
238	Escherichia	coli	O52			(135)
239	Escherichia	coli	O58			(136)
240	Escherichia	coli	O73			(137)
241	Escherichia	coli	O112ab			(138)
242	Escherichia	coli	O118			(139)
243	Escherichia	coli	O125			(140)
244	Escherichia	coli	O151			(139)
245	Escherichia	coli	O168			(141)
246	Shigella	dysenteriae	type 7			(142)
247	Shigella	dysenteriae	type 8 (Russian)			(110)
248	Shigella	dysenteriae	type 9			(110)
249	Yersinia	pestis	KM218-6C			(126)
250	Yersinia	Pestis	KM260(11)-yjhW-6C			(127)
251	Yersinia	pestis	KM260(11)-wabD/wa aL			(127)
252	Yersinia	pestis	KM260(11)-wabC/wa aL			(127)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
253	Yersinia	pseudotuberculosis	85pCad-37C			
254	Yersinia	pseudotuberculosis	85pCad-20C			
255	Yersinia	pseudotuberculosis	O:2a			(143)
256	Yersinia	pseudotuberculosis	O:2a-dhmA			(144)
257	Yersinia	pseudotuberculosis	O:2c			(145)
258	Yersinia	pseudotuberculosis	O:3			(145)
259	Yersinia	pseudotuberculosis	O:4b			(146)
260	Proteus	vulgaris	O2 (OX2)			(147)
261	Proteus	mirabilis	O3ab (S1959)			(147)
262	Proteus	mirabilis	O5	(PrK 12/57)		(5)
263	Proteus	mirabilis	O9	(PrK 18/57)		(148)
264	Proteus	mirabilis	O11 (9B-m)			(40)
265	Proteus	penneri	O17 (16)			(109)
266	Proteus	mirabilis	O18	(PrK 34/57)		(149)
267	Proteus	Mirabilis	O20	(PrK 38/57)		(109)
268	Proteus	penneri	O31ab (28)			(109)
269	Proteus	mirabilis	O33 (D52)			(150)
270	Proteus	mirabilis	O43	(PrK 69/57)		(151)
271	Proteus	vulgaris	O47	(PrK 73/57)		(109)
272	Proteus	mirabilis	O49	(PrK 75/57)		(152)
273	Proteus	mirabilis	O54ab (OE)			(109)
274	Proteus	penneri	O73ac (75)			(109)
275	Proteus	vulgaris	O76(HSC 438)			(109)
276	Shigella	flexneri	type 1a			(153)
277	Shigella	flexneri	type 1b			(154)
278	Shigella	flexneri type	2a			(155)
279	Shigella	flexneri	type 2b			(154)
280	Shigella	flexneri	type 3a			(154)
281	Shigella	flexneri	type 3b			(154)
282	Shigella	flexneri	type 4a			(154)
283	Shigella	flexneri	type 4b			(154)
284	Shigella	flexneri	type 5b			(5)
285	Shigella	flexneri	type 6a			(156)
286	Shigella	flexneri	type 6			(154)
287	Shigella	flexneri	type X			(154)
288	Shigella	dysenteriae	type 1			(156)
289	Shigella	boydii	type 6			(6)
290	Shigella	boydii	type 7			(110)
291	Shigella	boydii	type 8			(110)
292	Shigella	boydii	type 13			(157)
293	Shigella	boydii	type 14			(5)
294	Escherichia	coli	O71			(158)
295	Escherichia	coli	O85			(159)
296	Escherichia	coli	O99			(160)
297	Escherichia	coli	O145			(161)
298	Escherichia	coli	O107			(162)
299	Salmonella	enterica	O17			(159)

BPS Chart #	Genus	Species	Subtype	Additional	Symbol	Ref.
300	Salmonella	enterica	O28			(158)
301	Salmonella	enterica	O47			(163)
302	Salmonella	enterica	O55			(164)

Legend:

- Chart #1 to 48 represent Microbial Glycan Microarray (MGM)
- Chart #1 to 302 represent expanded Microbial Glycan Microarray (MGM)
- All symbol nomenclature and substituents can be found in Figure S8 and S9

* Structures are variable core regions and not O-antigen repeats

SLA = Salmonella LipidA

YLA = Yersinia LipidA

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