

## Supporting Information

### Glycan Signal Enhancement by Ammonium Fluoride Doping and Electrospray Diverting

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**Supplemental Table 1.** List of glycan masses, compositions, and detected *m/z* originating from prepared bovine fetuin. Glycoform masses refer to the cleaved *N*-linked glycans with an amine terminus and include the addition of water.

Glycoform Mass	Glycan Composition	[M-2H] <sup>2-</sup>	[M-3H] <sup>3-</sup>
1233.4494	Hex <sub>5</sub> HexNAc <sub>2</sub>	615.7174	-
1395.5022	Hex <sub>6</sub> HexNAc <sub>2</sub>	696.7438	-
1727.6242	Hex <sub>5</sub> HexNAc <sub>3</sub> NeuAc <sub>1</sub>	862.8048	-
1889.6770	Hex <sub>6</sub> HexNAc <sub>3</sub> NeuAc <sub>1</sub>	943.8312	-
1930.7036	Hex <sub>5</sub> HexNAc <sub>4</sub> NeuAc <sub>1</sub>	964.3445	642.5606
2221.7990	Hex <sub>5</sub> HexNAc <sub>4</sub> NeuAc <sub>2</sub>	1109.8922	739.5924
2237.7939	Hex <sub>5</sub> HexNAc <sub>4</sub> NeuAc <sub>1</sub> NeuGc <sub>1</sub>	1117.8897	-
2238.8143	Hex <sub>6</sub> HexNAc <sub>4</sub> Fuc <sub>1</sub> NeuAc <sub>1</sub>	1118.3999	-
2367.8569	Hex <sub>5</sub> HexNAc <sub>4</sub> Fuc <sub>1</sub> NeuAc <sub>2</sub>	1182.9212	-
2512.8944	Hex <sub>5</sub> HexNAc <sub>4</sub> NeuAc <sub>3</sub>	1255.4399	836.6242

2586.9312	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>2</sub>	1292.4583	861.3031
2732.9891	Hex <sub>6</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuAc <sub>2</sub>	1365.4873	909.9891
2878.0266	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>3</sub>	1438.0060	958.3349
2894.0215	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>2</sub> NeuGc <sub>1</sub>	1446.0035	963.6666
3169.1220	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>4</sub>	1583.5537	1055.3667
2092.7564	Hex <sub>6</sub> HexNAc <sub>4</sub> NeuAc <sub>1</sub>	-	696.5782
2894.0467	Hex <sub>5</sub> HexNAc <sub>3</sub> Fuc <sub>4</sub> NeuAc <sub>3</sub>	-	963.6749
3024.0845	Hex <sub>6</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuAc <sub>3</sub>	-	1007.0209
3185.1169	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>3</sub> NeuGc <sub>1</sub>	-	1060.6984
3460.2174	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>5</sub>	-	1152.3985
3534.2542	Hex <sub>7</sub> HexNAc <sub>6</sub> NeuAc <sub>4</sub>	-	1177.0775

**Supplemental Table 2.** List of glycan masses, compositions, and detected *m/z* originating from prepared FFPE human kidney tissues. Glycoform masses refer to the cleaved *N*-linked glycans with an alcohol terminus and include the addition of water.

Glycoform Mass	Glycan Composition	[M-2H] <sup>2-</sup>	[M-H+Cl] <sup>2-</sup>	[M+2Cl] <sup>2-</sup>	[M-3H] <sup>3-</sup>	[M-2H+Cl] <sup>3-</sup>
1234.4336	Hex <sub>5</sub> HexNAc <sub>2</sub>	616.2095	634.1978			
1396.4866	Hex <sub>6</sub> HexNAc <sub>2</sub>	697.2360	837.2773			
1640.5926	Hex <sub>5</sub> HexNAc <sub>4</sub>	819.2890		855.2657		
1786.6506	Hex <sub>5</sub> HexNAc <sub>4</sub> Fuc <sub>1</sub>	892.3180	910.3063	928.2947		
1827.6766	Hex <sub>4</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub>	912.8310		948.8083		
1931.6876	Hex <sub>4</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuGc <sub>1</sub>	964.8365	982.8248			
1989.7296	Hex <sub>5</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub>	993.8575		1029.8348		
2077.7456	Hex <sub>5</sub> HexNAc <sub>4</sub> Fuc <sub>1</sub> NeuAc <sub>1</sub>	1037.8655	1055.8538		691.5746	
2222.7826	Hex <sub>5</sub> HexNAc <sub>5</sub> NeuAc <sub>2</sub>	1110.3840			739.9202	
2262.8589	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>1</sub>		1165.3916			
2368.8406	Hex <sub>5</sub> HexNAc <sub>4</sub> Fuc <sub>1</sub> NeuAc <sub>2</sub>	1183.4130			788.6062	751.9124
2442.8776	Hex <sub>6</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuAc <sub>1</sub>	1220.4315	1238.4208			
2735.9899	Hex <sub>6</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuAc <sub>2</sub>	1365.9804				
2589.9305	Hex <sub>6</sub> HexNAc <sub>5</sub> NeuAc <sub>2</sub>	1292.9507				
3031.1149	Hex <sub>6</sub> HexNAc <sub>5</sub> Fuc <sub>1</sub> NeuAc <sub>3</sub>				1007.3498	

**Supplemental Figure 1.** Heatmaps of all glycans observed in kidney tissue, comparing two halves of the same tissue. One half was imaged using control conditions while the other used ESI-DD, observing a range of signal enhancements. The signal enhancement reported here refers to the enhancement of the representative tissue shown. Proposed glycan structures are provided by GlyConnect based on reported MS/MS of the experimentally observed  $m/z$  peaks.

