

Supporting Information

Mass spectrometry imaging of N-glycans from formalin-fixed paraffin-embedded tissue sections using a novel subatmospheric pressure ionization source

Yatao Shi [†], Zihui Li [‡], Mildred A Felder [°], Qinying Yu [†], Xudong Shi [§], Yajing Peng[‡],

Qinjingwen Cao [‡], Bin Wang[†], Luigi Puglielli[‡], Manish S Patankar [°], Lingjun Li ^{†,‡,*}

[†] School of Pharmacy, University of Wisconsin-Madison, Madison, WI, 53705, USA

[‡] Department of Chemistry, University of Wisconsin-Madison, Madison, WI, 53706, USA

[§] Department of Surgery, School of Medicine and Public Health, University of Wisconsin-Madison, Madison, WI, USA

[°]Department of Obstetrics and Gynecology, University of Wisconsin, Madison, WI, USA

[‡] Department of Medicine, University of Wisconsin-Madison, Madison, WI, USA.

*Corresponding author

Tel.: +1 (608) 265-8491

Fax: +1 (608) 262-5345

E-mail: lingjun.li@wisc.edu

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Table S2. N-glycans reported in Ref 32 & 33 and detected by SubAP/MALDI-MS platform from FFPE mouse brain section. H: Hexose; N: N-Acetylglucosamine; F: Fucose; S: Sialic acid

Table S3. List of N-glycans detected from FFPE mouse ovarian cancer tissue section.

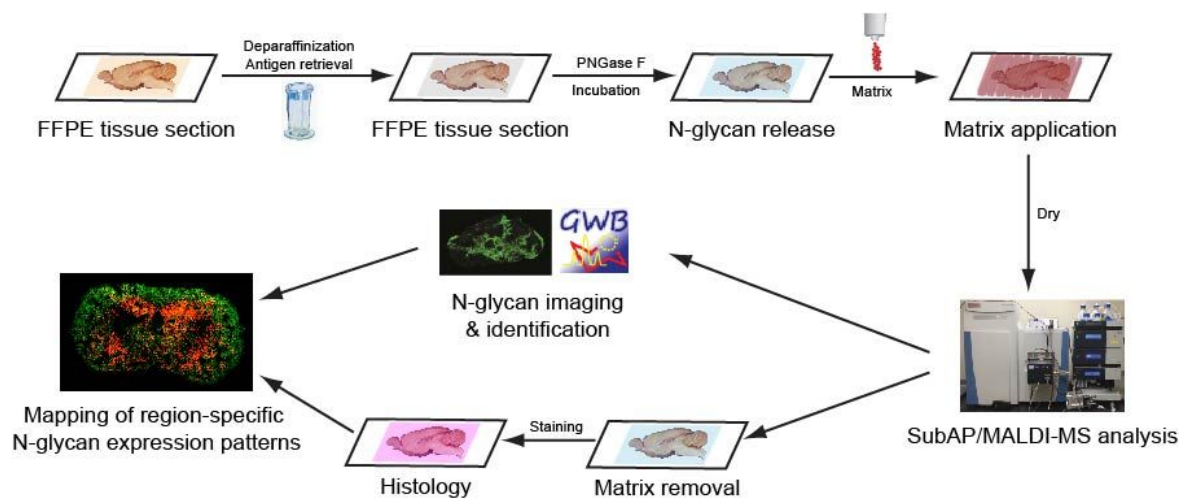


Figure S1. Typical workflow for imaging of N-glycans from FFPE tissue sections using the SubAP/MALDI-MS platform.

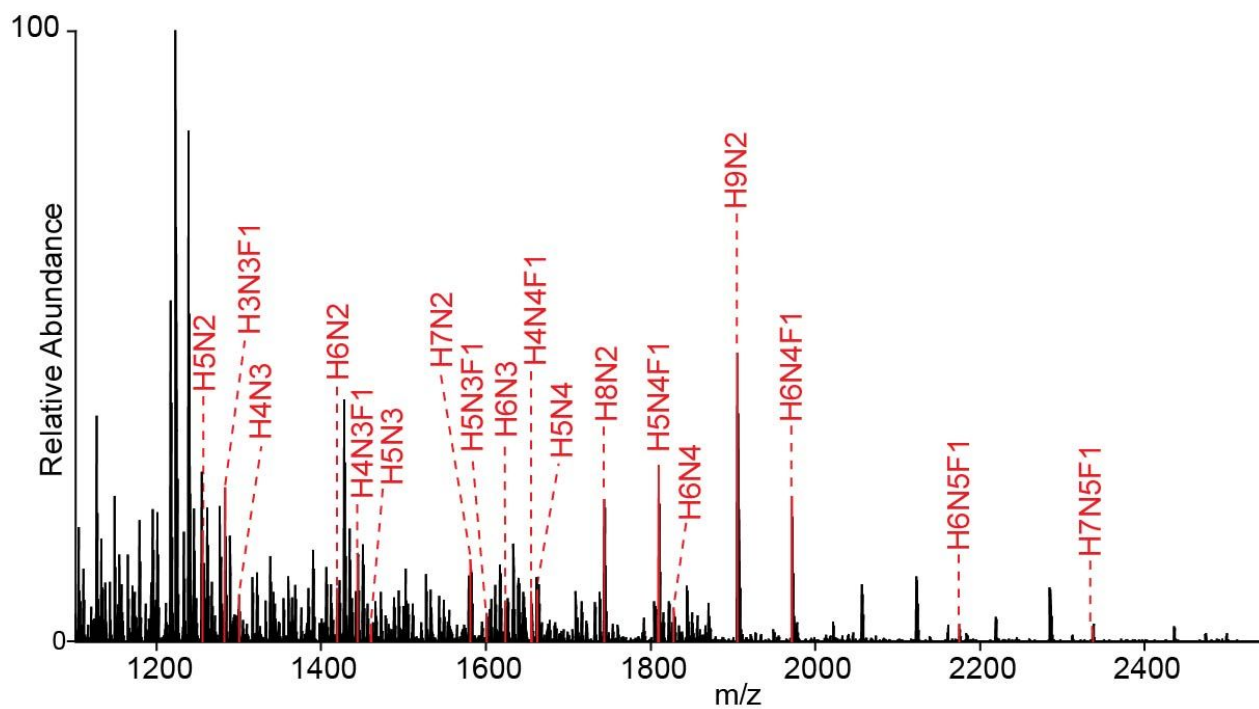


Figure S2. Representative MS spectrum of N-glycans released from bovine thyroglobulin collected with SubAP/MALDI-QEHF MS. H: Hexose; N: N-Acetylglucosamine; F: Fucose.

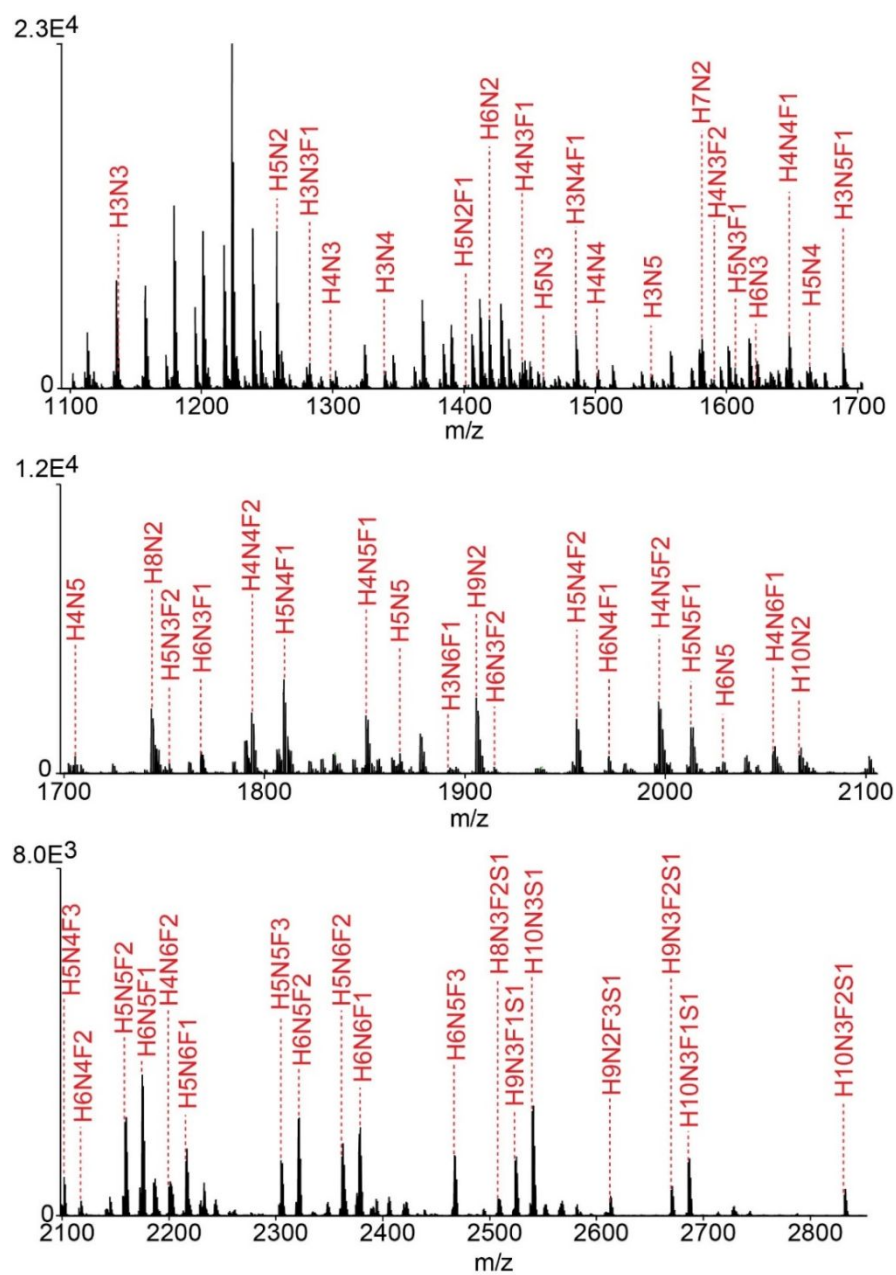


Figure S3. N-glycans detected from FFPE mouse brain section using SubAP/MALDI-MS platform. H: Hexose; N: N-Acetylglucosamine; F: Fucose; S: Sialic acid.

Table S1. N-glycans detected from FFPE mouse brain section using SubAP/MALDI-MS platform.

m/z (+Na)	Identified N-glycans	Mass deviation (ppm)	m/z (+Na)	Identified N-glycans	Mass deviation (ppm)
1136.3952	Hex ₃ HexNAc ₃	1	1905.6299	Hex ₉ HexNAc ₂	2
1257.4232	Hex ₅ HexNAc ₂	0.5	1914.6621	Hex ₆ HexNAc ₃ dHex ₂	4
1282.4527	Hex ₃ HexNAc ₃ dHex ₁	1	1955.6928	Hex ₅ HexNAc ₄ dHex ₂	2
1298.4488	Hex ₄ HexNAc ₃	0.3	1971.6812	Hex ₆ HexNAc ₄ dHex ₁	5.5
1339.4741	Hex ₃ HexNAc ₄	1	1996.7157	Hex ₄ HexNAc ₅ dHex ₂	4
1403.4740	Hex ₅ HexNAc ₂ dHex ₁	4	2012.7104	Hex ₅ HexNAc ₅ dHex ₁	4
1419.4784	Hex ₆ HexNAc ₂	2	2028.6978	Hex ₆ HexNAc ₅	7
1444.5090	Hex ₄ HexNAc ₃ dHex ₁	1	2053.7325	Hex ₄ HexNAc ₆ dHex ₁	6
1460.5029	Hex ₅ HexNAc ₃	0.6	2067.6873	Hex ₁₀ HexNAc ₂	0
1485.5353	Hex ₃ HexNAc ₄ dHex ₁	1	2101.7387	Hex ₅ HexNAc ₄ dHex ₃	8
1501.5285	Hex ₄ HexNAc ₄	0	2117.7344	Hex ₆ HexNAc ₄ dHex ₂	7
1542.5542	Hex ₃ HexNAc ₅	0.6	2158.7634	Hex ₅ HexNAc ₅ dHex ₂	6
1581.5279	Hex ₇ HexNAc ₂	0.2	2174.7576	Hex ₆ HexNAc ₅ dHex ₁	5
1590.5617	Hex ₄ HexNAc ₃ dHex ₂	2	2199.7842	Hex ₄ HexNAc ₆ dHex ₂	8
1606.5598	Hex ₅ HexNAc ₃ dHex ₁	0	2215.7813	Hex ₅ HexNAc ₆ dHex ₁	7
1622.5511	Hex ₆ HexNAc ₃	2	2304.8148	Hex ₅ HexNAc ₅ dHex ₃	8
1647.5874	Hex ₄ HexNAc ₄ dHex ₁	0.6	2320.8122	Hex ₆ HexNAc ₅ dHex ₂	7
1663.5806	Hex ₅ HexNAc ₄	0.5	2361.8348	Hex ₅ HexNAc ₆ dHex ₂	9
1688.6129	Hex ₃ HexNAc ₅ dHex ₁	0	2377.8285	Hex ₆ HexNAc ₆ dHex ₁	9
1704.6021	Hex ₄ HexNAc ₅	3	2466.8614	Hex ₆ HexNAc ₅ dHex ₃	10
1743.5799	Hex ₈ HexNAc ₂	0.7	2507.8749 (+H)	Hex ₈ HexNAc ₃ NeuAc ₁ dHex ₂	6
1752.6130	Hex ₅ HexNAc ₃ dHex ₂	3	2523.8793 (+H)	Hex ₉ HexNAc ₃ NeuAc ₁ dHex ₁	2
1768.6097	Hex ₆ HexNAc ₃ dHex ₁	0	2539.8764 (+H)	Hex ₁₀ HexNAc ₃ NeuAc ₁	1
1793.6421	Hex ₄ HexNAc ₄ dHex ₂	1	2612.9016 (+H)	Hex ₉ HexNAc ₂ NeuAc ₁ dHex ₃	7
1809.6370	Hex ₅ HexNAc ₄ dHex ₁	1	2669.9299 (+H)	Hex ₉ HexNAc ₃ NeuAc ₁ dHex ₂	5
1850.6631	Hex ₄ HexNAc ₅ dHex ₁	1.5	2685.9269 (+H)	Hex ₁₀ HexNAc ₃ NeuAc ₁ dHex ₁	4
1866.6469	Hex ₅ HexNAc ₅	7.5	2831.9749 (+H)	Hex ₁₀ HexNAc ₃ NeuAc ₁ dHex ₂	7
1891.6793	Hex ₃ HexNAc ₆ dHex ₁	7			

Table S2. N-glycans reported in previous studies (Refs. 32 & 33) and detected by SubAP/MALDI-MS platform from FFPE mouse brain section. H: Hexose; N: N-Acetylglucosamine; F: Fucose; S: Sialic acid

N-glycan	Powers TW, et. al (Ref 32)	Toghi. ES, et. al (Ref 33)	This study	N-glycan	Powers TW, et. al (Ref 32)	Toghi. ES, et. al (Ref 33)	This study
H3N3	×	×	√	H6N5	×	×	√
H5N2	√	√	√	H4N6F1	×	√	√
H3N3F1	×	√	√	H10N2	×	×	√
H4N3	×	√	√	H5N4F3	√	√	√
H3N4	×	√	√	H6N4F2	√	√	√
H5N2F1	×	√	√	H5N5F2	√	√	√
H6N2	√	√	√	H6N5F1	×	√	√
H4N3F1	×	√	√	H4N6F2	×	√	√
H5N3	×	√	√	H5N6F1	√	√	√
H3N4F1	×	√	√	H6N6	×	√	×
H4N4	√	√	√	H5N5F3	×	√	√
H3N5	√	√	√	H6N5F2	×	√	√
H7N2	×	√	√	H5N6F2	×	√	√
H4N3F2	×	×	√	H6N6F1	×	×	√
H5N3F1	×	√	√	H6N5F3	×	√	√
H6N3	×	×	√	H ₅ N ₆ F ₁ S ₁	√	×	×
H4N4F1	√	√	√	H ₅ N ₄ F ₁ S ₂	√	×	×
H5N4	×	√	√	H ₅ N ₆ F ₂ S ₁	√	×	×
H3N5F1	√	√	√	H5N6F3	×	√	×
H4N5	×	×	√	H6N6F2	×	√	×
H8N2	√	√	√	H ₇ N ₆ S ₁	√	×	×
H5N3F2	×	×	√	H ₆ N ₅ F ₃ S ₁	√	×	×
H6N3F1	×	√	√	H ₆ N ₅ F ₂ S ₂	√	×	×
H4N4F2	√	√	√	H ₇ N ₆ F ₃ S ₁	√	×	×
H5N4F1	√	√	√	H ₇ N ₆ F ₄ S ₁	√	×	×
H4N5F1	×	√	√	H6N5F4	×	√	×
H5N5	×	×	√	H6N6F3	×	√	×
H3N6F1	×	×	√	H8N3F2S1	×	×	√
H9N2	×	√	√	H9N3F1S1	×	×	√
H6N3F2	×	×	√	H10N3S1	×	×	√
H5N4F2	√	√	√	H9N2F3S1	×	×	√
H6N4F1	×	√	√	H9N3F2S1	×	×	√
H4N5F2	√	√	√	H10N3F1S1	×	×	√
H5N5F1	×	√	√	H10N3F2S1	×	×	√

Note: √: Detected ×: Undetected

Table S3. List of N-glycans detected from FFPE mouse ovarian cancer tissue section.

m/z (+Na)	Identified N-glycans	Mass deviation (ppm)	m/z (+Na)	Identified N-glycans	Mass deviation (ppm)
933.3164	Hex ₃ HexNAc ₂	0.6	1663.5847	Hex ₅ HexNAc ₄	2
1079.3758	Hex ₃ HexNAc ₂ dHex ₁	1	1743.5833	Hex ₈ HexNAc ₂	1
1095.3714	Hex ₄ HexNAc ₂	1.5	1768.6121	Hex ₆ HexNAc ₃ dHex ₁	0
1257.4233	Hex ₅ HexNAc ₂	0.5	1784.6084	Hex ₇ HexNAc ₃	0.4
1282.4527	Hex ₃ HexNAc ₃ dHex ₁	1	1809.6423	Hex ₅ HexNAc ₄ dHex ₁	2
1298.4498	Hex ₄ HexNAc ₃	0.5	1825.6335	Hex ₆ HexNAc ₄	0
1419.4774	Hex ₆ HexNAc ₂	1	1905.6362	Hex ₉ HexNAc ₂	1
1444.5070	Hex ₄ HexNAc ₃ dHex ₁	0	1971.6936	Hex ₆ HexNAc ₄ dHex ₁	1
1460.5031	Hex ₅ HexNAc ₃	0.7	2028.7106	Hex ₆ HexNAc ₅	1.5
1485.5338	Hex ₃ HexNAc ₄ dHex ₁	0	2067.6856	Hex ₁₀ HexNAc ₂	0.5
1501.5296	Hex ₄ HexNAc ₄	1	2133.7442	Hex ₇ HexNAc ₄ dHex ₁	0
1581.5307	Hex ₇ HexNAc ₂	1	2174.7692	Hex ₆ HexNAc ₅ dHex ₁	1
1606.5614	Hex ₅ HexNAc ₃ dHex ₁	1	2336.8212	Hex ₇ HexNAc ₅ dHex ₁	1.3
1622.5553	Hex ₆ HexNAc ₃	0	2539.8946	Hex ₇ HexNAc ₆ dHex ₁	3
1647.5867	Hex ₄ HexNAc ₄ dHex ₁	0			