

Supplementary information for

Synthesis and Characterization of Photo-cross-linkable Quince Seed-based Hydrogels for Soft Tissue Engineering Applications

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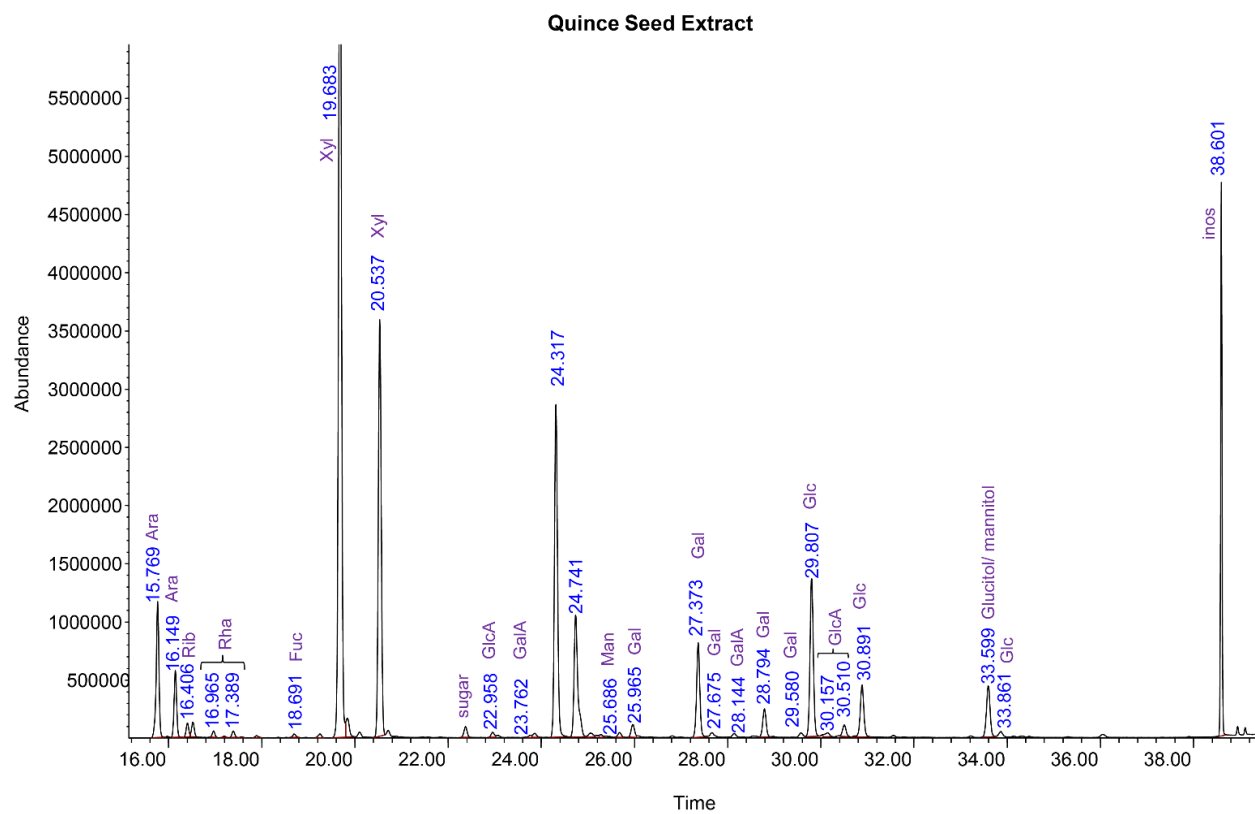
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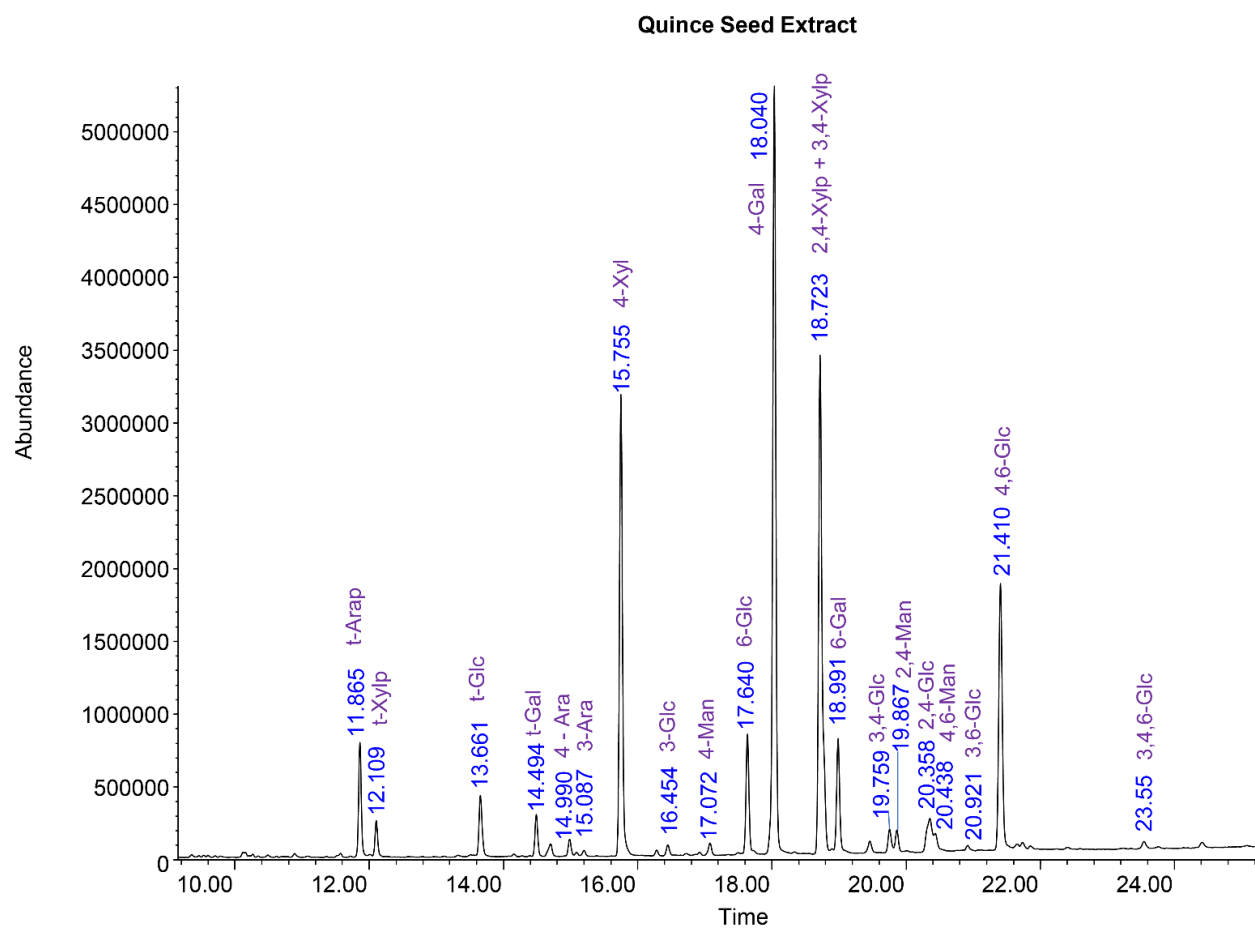
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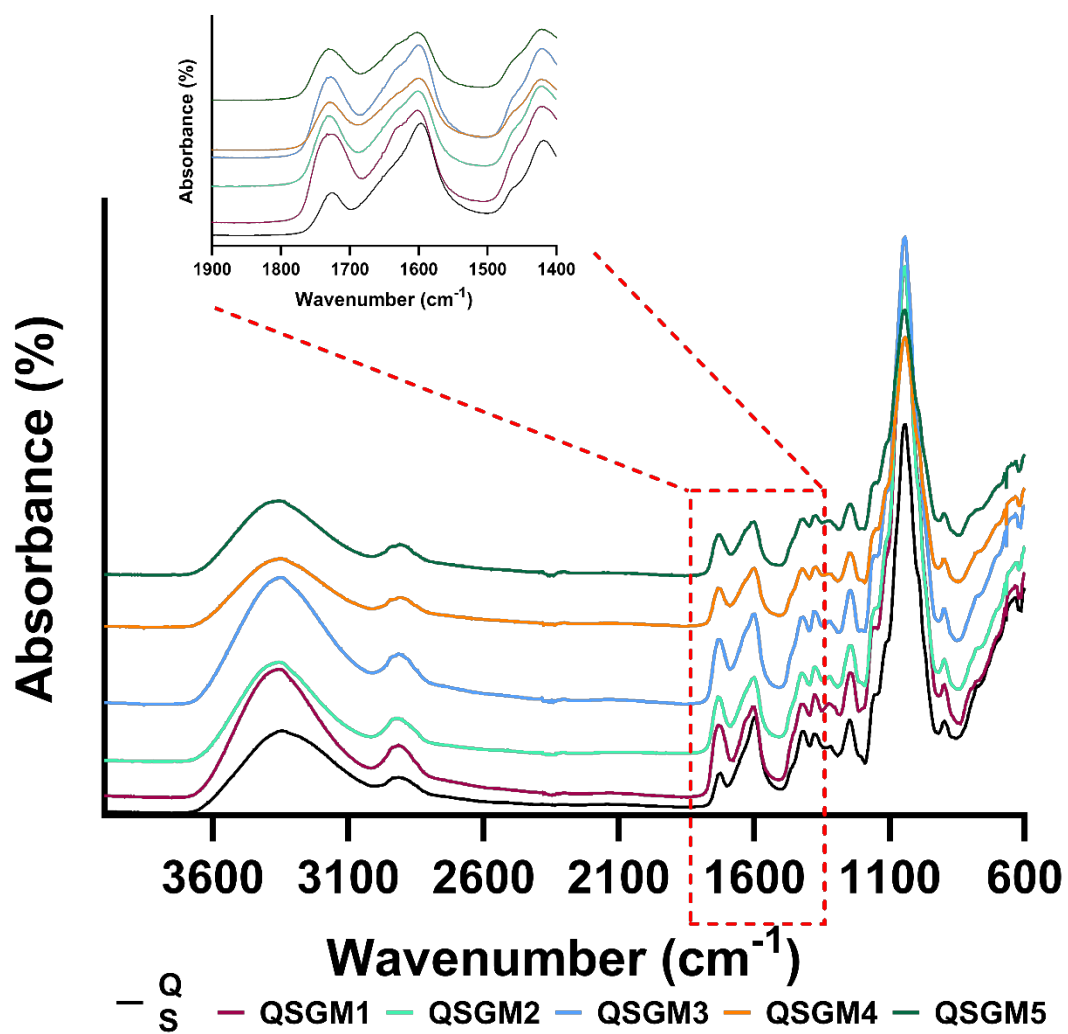
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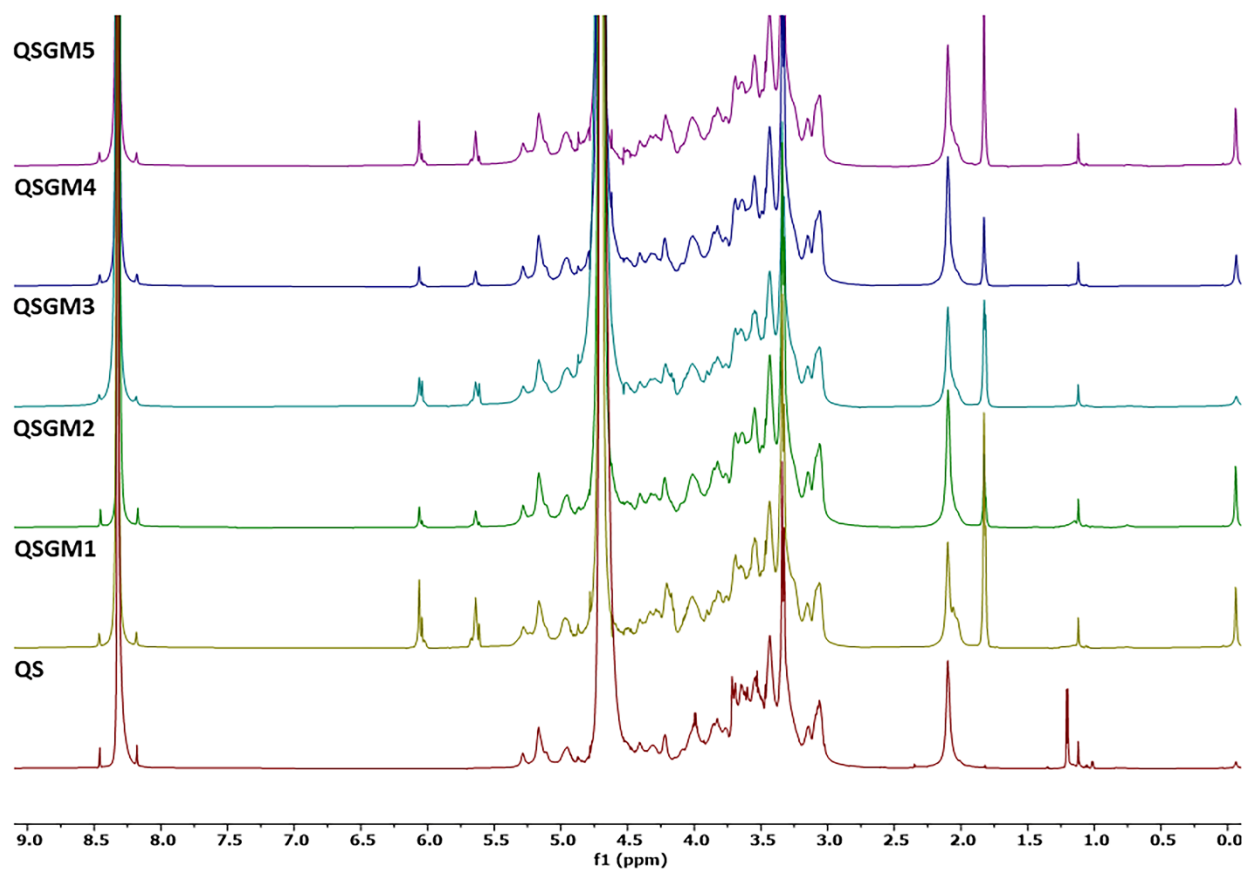
Supplementary Figure S1. Total ion chromatogram for the TMS residues from the QS. The peaks that are non-labeled are non-carbohydrate components.



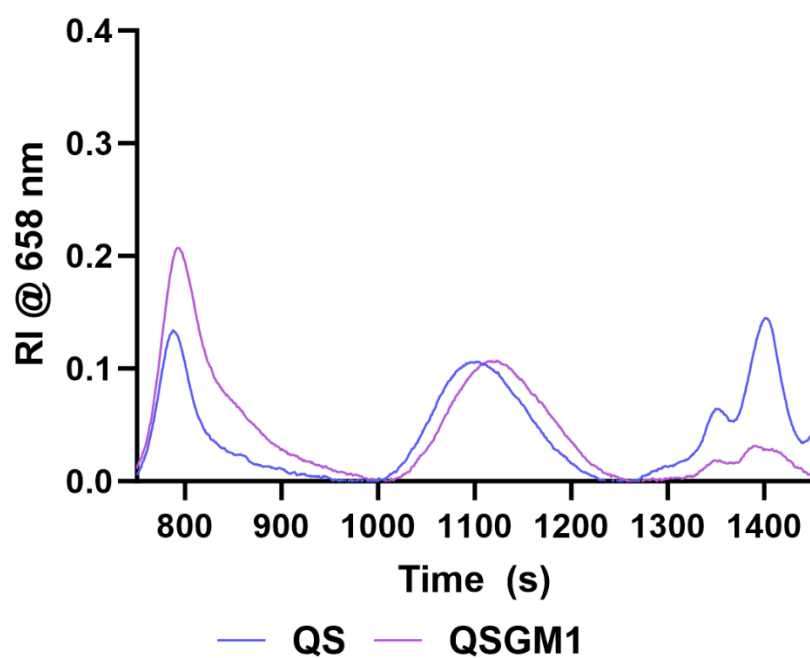
Supplementary Figure S2. Total ion chromatogram for the glycosyl linkage analysis of the quince seed extract. The peaks that are non-labeled are non-carbohydrate components.



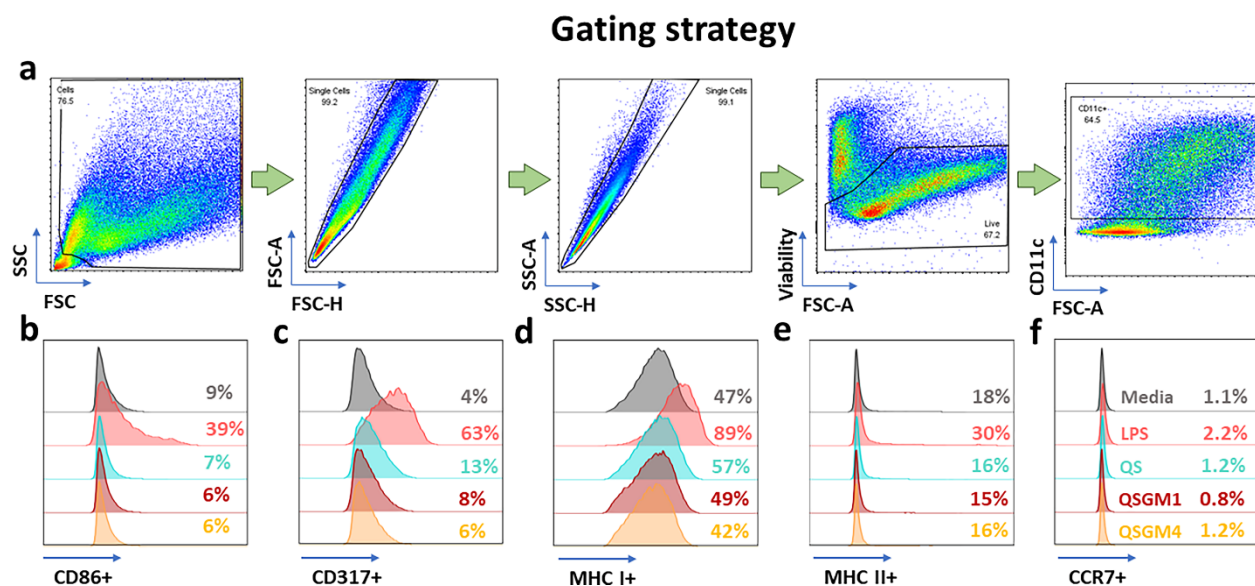
Supplementary Figure S3. FTIR spectra of unmodified QS and synthesized QSGMs. The insert shows a magnification of the spectra in the range of 1400-1900 cm⁻¹.



Supplementary Figure S4. ¹H-NMR Spectra of unmodified QS and photosensitive QSGMs synthesized with different reaction conditions. Peaks at $5.5 < \delta < 6.5$ ppm show hydrogens attached to C=C.

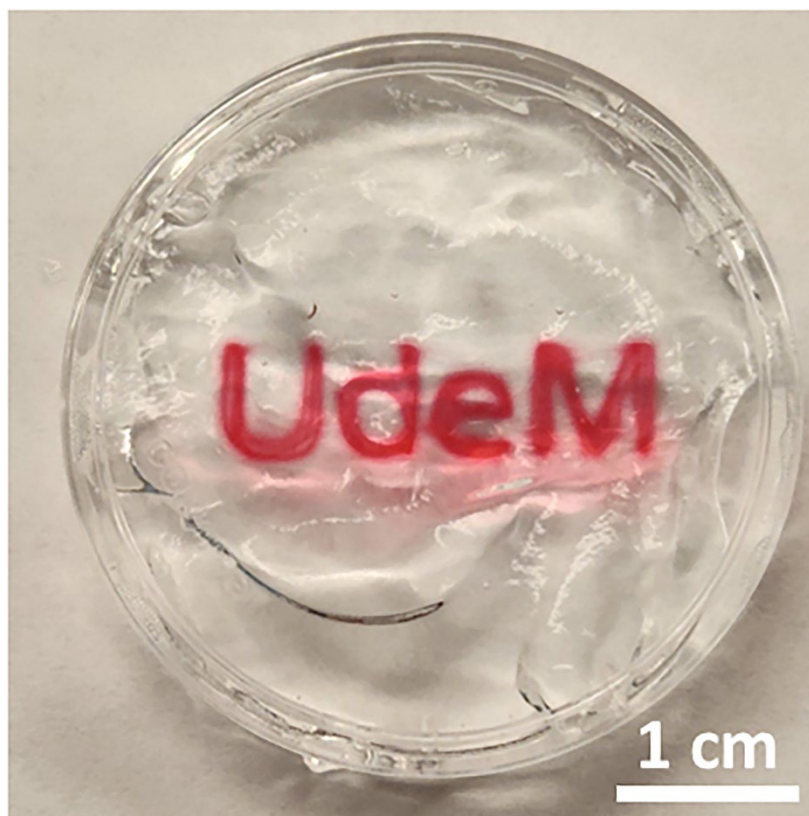


Supplementary Figure S5. GPC profile curves of QS and QSGM1 obtained to find the molecular weight of the non-modified and photosensitive polysaccharide.



Supplementary Figure S5: Activation of mouse bone-marrow-derived dendritic cells (BMDCs) *in vitro*.

BMDCs were cultured for 24h in the following stimulating conditions: Media (negative control), LPS (Lipopolysaccharide) at 500 ng/mL (positive control), QS polymer, QSGM1, and QSGM5. (a) Flow cytometry gating strategy for BMDCs. Cells were gated, and debris was eliminated using forward and side scatter (FSC and SSC) properties. Following this, single cells were gated based on area (A) and height (H) parameters. Subsequently, live cells were selected, and then CD11c+ cells were gated, identifying them as BMDCs. Histogram plot of activated BMDCs (b) CD11c+ CD86+ (c) CD11c+ CD317+ (d) CD11c+ MHC I+ (e) CD11c+ MHC II+ (f) CD11c+ CCR7+ 24h after culture with different conditions.



Supplementary Figure S6. 3D printing of the University of Montreal logo (UdeM) using 0.5% QSGM1 ink showing the potential of 3D printing complex structures using this photosensitive ink.

Supplementary Table S1. Weight average molecular weight (M_w), number average molecular weight (M_n), and polydispersity index (PDI) of QS and QSGM1 obtained using GPC analysis.

Sample		M_w	M_n	PDI
QSGM1	Peak 1	842000 $\pm$ 6000	710000 $\pm$ 9000	1.19 $\pm$ 0.01
	Peak 2	24000 $\pm$ 800	18900 $\pm$ 600	1.27 $\pm$ 0.01
QS	Peak 1	912000 $\pm$ 3000	839000 $\pm$ 4000	1.09 $\pm$ 0.02
	Peak 2	29600 $\pm$ 300	23400 $\pm$ 500	1.27 $\pm$ 0.01

Supplementary Table S2. Expression of cell surface markers and secretion of proinflammatory cytokines by BMDCs. Values represent mean and SD (n= 5).

Markers	Media	LPS	QS	QSGM1	QSGM4
CD86 (%)	10.3 $\pm$ 0.8	36.6 $\pm$ 1.5	7.7 $\pm$ 1.2	6.9 $\pm$ 0.4	6.3 $\pm$ 0.5
CD317 (%)	4.0 $\pm$ 0.2	63.7 $\pm$ 1.0	10.8 $\pm$ 5.1	6.9 $\pm$ 1.0	7.0 $\pm$ 1.2
MHC I (%)	47.2 $\pm$ 0.5	88.8 $\pm$ 0.4	49.5 $\pm$ 5.4	45.8 $\pm$ 2.2	46.1 $\pm$ 2.3
MHC II (%)	17.7 $\pm$ 0.1	26.8 $\pm$ 1.8	15.5 $\pm$ 1.0	15.5 $\pm$ 0.4	15.4 $\pm$ 0.7
CCR7 (%)	1.1 $\pm$ 0.1	2.4 $\pm$ 0.3	1.0 $\pm$ 0.2	1.0 $\pm$ 0.1	1.3 $\pm$ 0.6
IL-6 (pg/mL)	0 $\pm$ 0	40159 $\pm$ 4328	18012 $\pm$ 20249	2013 $\pm$ 858	4556 $\pm$ 1973
TNF- α (pg/mL)	31 $\pm$ 4	4776 $\pm$ 502	2269 $\pm$ 2346	348 $\pm$ 177	517 $\pm$ 184