SUPPORTING INFORMATION

An Automated Materials Screening Approach for the Development of Sol-Gel Derived Monolithic Silica Enzyme Reactor Columns

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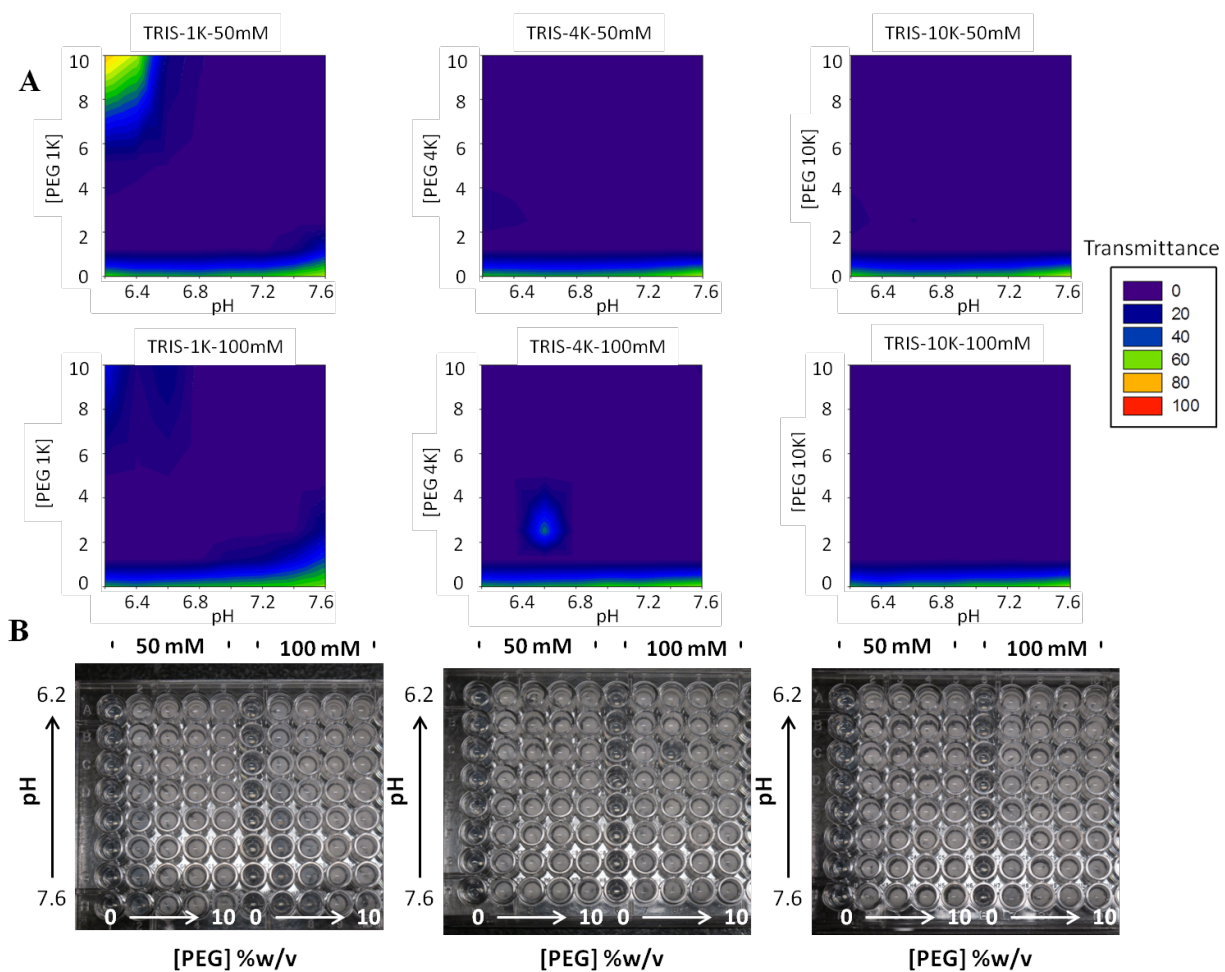Internet: brennanlab.ca; biointerfaces.mcmaster.ca

Figure S1: A) Opacity plots of a selection of materials tested involving the use of TRIS buffer. Scale bar indicates % transmittance. B) Optical images of materials showing a range in opacity.
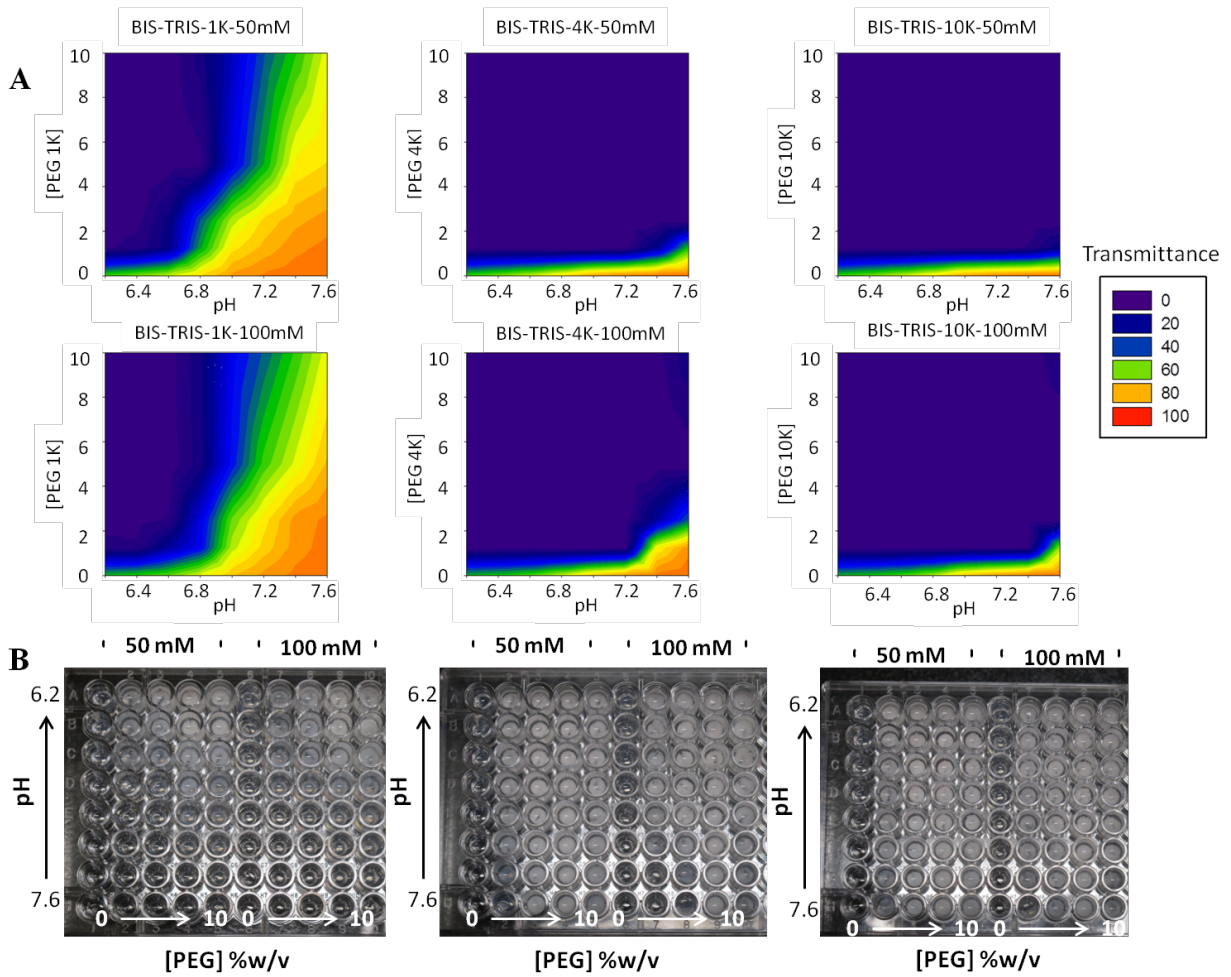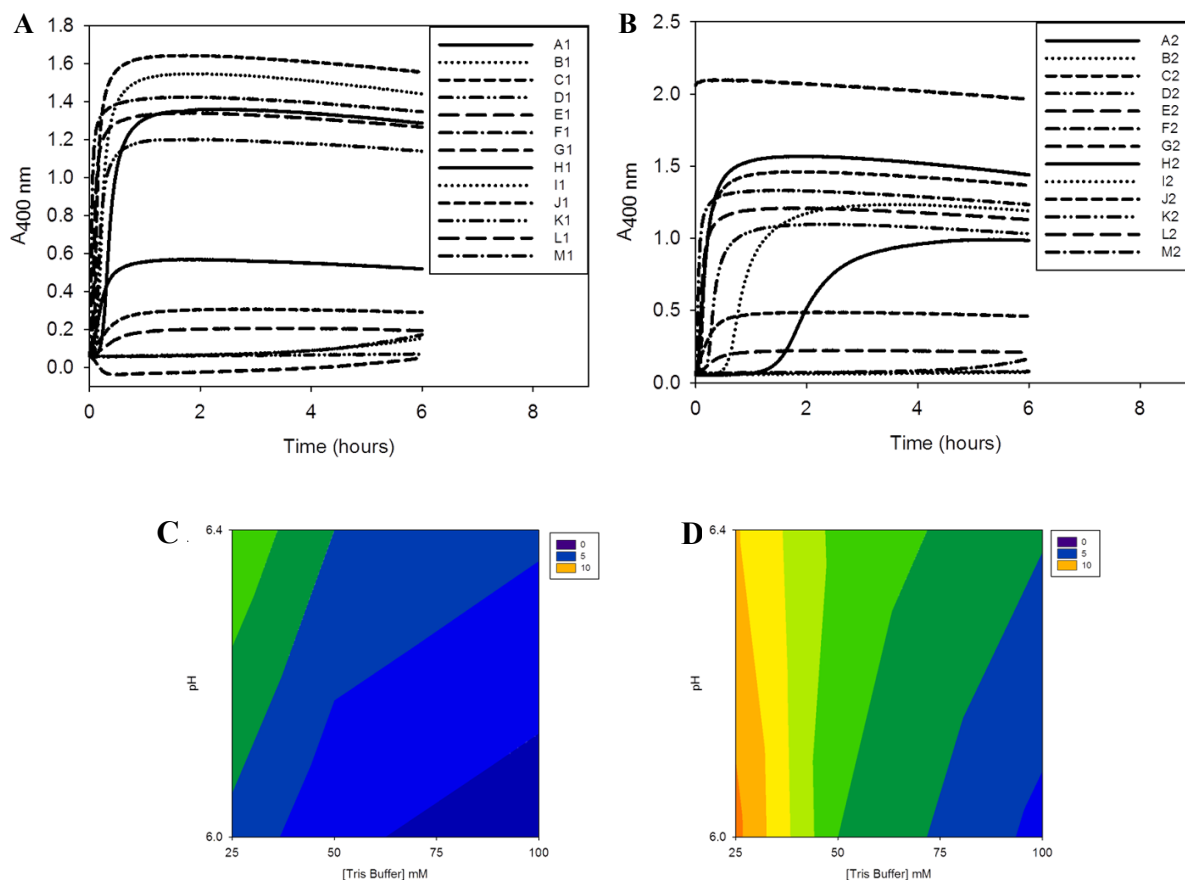
Figure S2: A) Opacity plots of a selection of materials tested involving the use of BIS-TRIS buffer. Scale bar indicates % transmittance. B) Optical images of materials showing a range in opacity.

Sample Name	Buffer	[Buffer] mM	pH buffer	PEG MW Da	[PEG] %
A (1,2)	Hepes	100	6.2	1000	1.25
B (1,2)	Hepes	100	6.2	1000	10
C (1,2)	Hepes	25	7.0	1000	1.25
D (1,2)	Hepes	25	7.0	1000	10
E (1,2)	Hepes	50	7.0	1000	1.25
F (1,2)	Hepes	50	7.0	1000	10
G (1,2)	Hepes	50	8.0	10,000	1.25
H (1,2)	Tris	25	6.0	600	1.25
I (1,2)	Tris	50	6.0	600	1.25
J (1,2)	Tris	100	6.0	600	1.25
K (1,2)	Tris	25	6.4	600	1.25
L (1,2)	Tris	50	6.4	600	1.25
M (1,2)	Tris	100	6.4	600	1.25

Samples denoted with a "1" contain no glycerol, samples denoted with a "2" contain 12.5% glycerol.

Figure S3: Kinetic study of a selection of materials showing varying ranges of phase separation onset and resulting in various opacities for A) materials in the absence of glycerol and B) materials in the presence of glycerol. Opacity plots of a selection of materials tested for PEG 600 1.25 % in C) absence of glycerol and D) presence of 12.5% glycerol. Scale bar indicates % transmittance. E) Table of material formulations used in glycerol study.

Sample	Buffer	[Buffer] mM	Buffer pH	PEG MW (Da)	[PEG] %	Pc (psi) 1 µL/min	Pc (psi) 5 µL/min	Pc (psi) 10 µL/min
Blank	--	--	--	--	--	154	232	302
i	HEPES	100	6.2	1000	10	950	--	--
ii	HEPES	50	6.2	1000	10	275	360	460
iii	HEPES	50	7.0	1000	10	194*	--	--
iv	TRIS	100	6.4	600	1.25	>3500	--	--

Table S1: Table of backpressure readings performed on the Eksigent NanoLC for materials used for SEM imaging. * indicates material excreted from capillary.

A

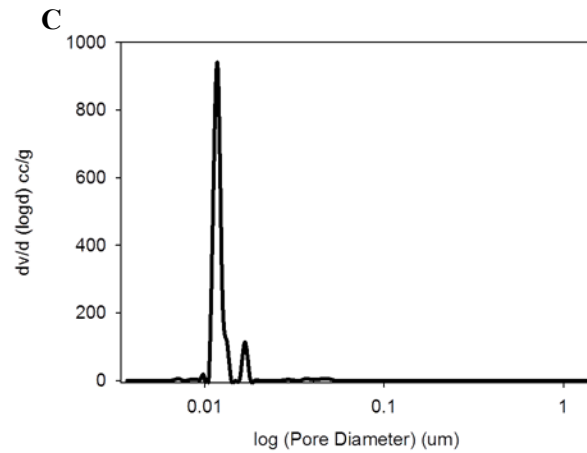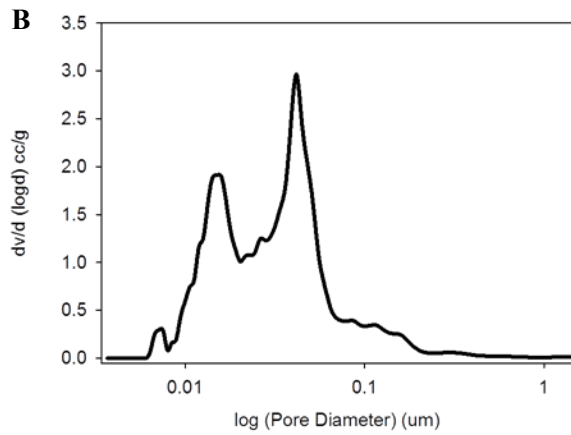| Sample	Bulk Particle Density (g/cc)	Macropore Volume (%)	Mesopore Volume (%)
i	0.5	8	92
ii	0.7	30	70
iii	0.3	98	1
iv	1.12	1	99

B

Material ii

C

Material iv

Figure S4: A) Mercury porosimetry data obtained for materials shown in backpressure and SEM studies. Pore size distribution curves for B) Material ii, and C) Material iv.

Monolith #	[TRIS] (mM)	[PEG 600] (% w/v)	pH
1	25	1.25	6.0
2	25	1.25	6.4
3	50	1.25	6.0
4	50	1.25	6.4
5	100	1.25	6.0
6	100	1.25	6.4

Table S2: Table of compositions tested for leaching and activity of AChE.