Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Antibacterial Properties of Electrospun $Ti_3C_2T_z$ (MXene)/Chitosan Nanofibers

Elisa A. Mayerberger[#], Reva M. Street[#], Riki M. McDaniel, Michel W. Barsoum, Caroline L. Schauer[*]

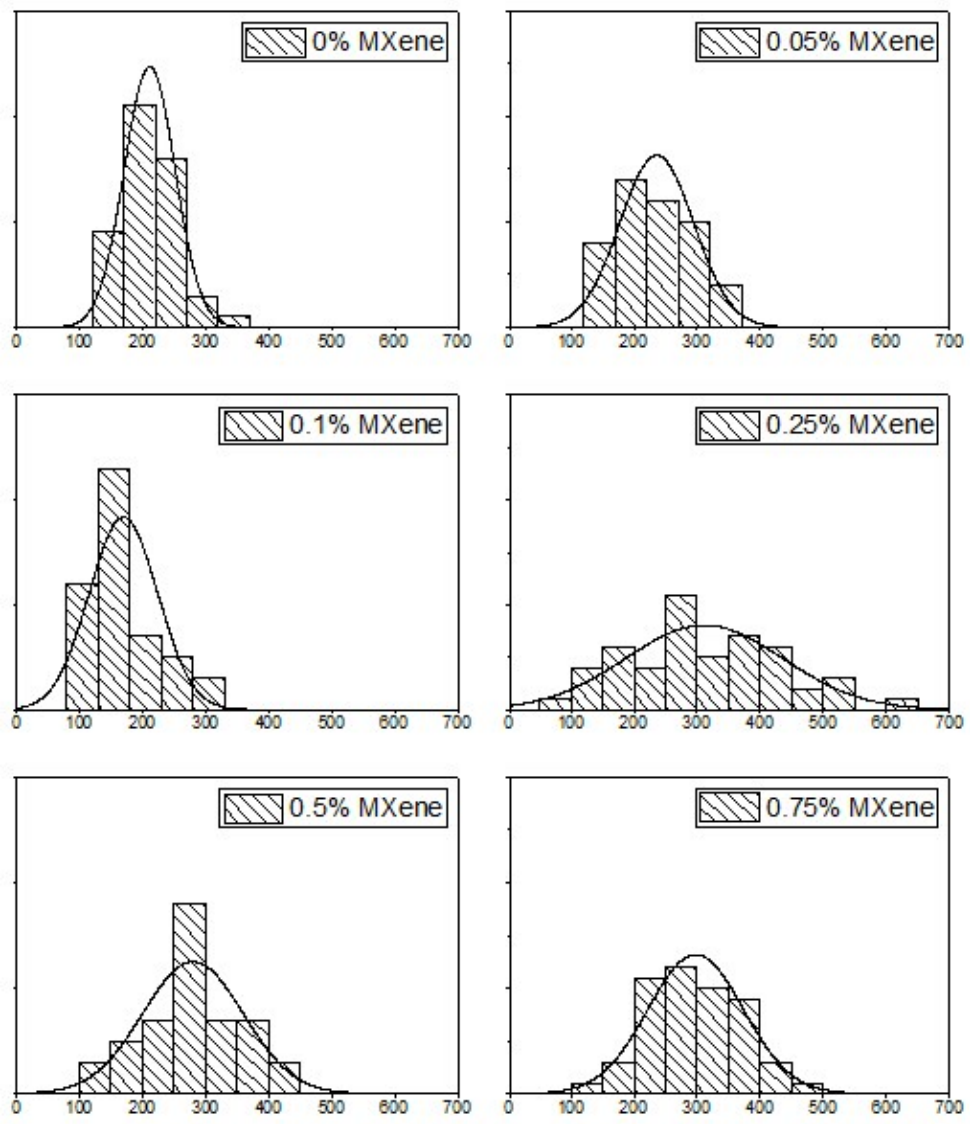

Figure S1. Fiber diameter distribution for the $Ti_3C_2T_z$/CS nanofibers.

Table S1. The antibacterial properties of select polymeric nanofibers with incorporated antibacterial agents such as metal oxides and 2D materials were compared. Materials were chosen based on antibacterial agent incorporation within the nanofibers as opposed to being decorated. Antibacterial activities of polymer blends were also compared.

Nanofiber Antibacterial Activity Comparison

Carrier Polymer (%)	Antibacterial Agent	Fiber amount used	Gram (-) type, cell reduction (%)	Gram (+) type, cell reduction (%)	Time (h)	Support Material	Incorporation Method	CL (Y/N)	fiber diameter (nm)	Ref.
10-15 wt% PU	5 wt% ZnO	7 g/m^2	*k. pneumoniae*, 98.7	*s. aureus* 99.9	NS	cotton	Dispersion	N	300-700	[63]
11 wt% PVA	2 wt% TiO2	3 g/ m^2	*k. pneumoniae*, 6.3	*s. aureus* 99.3	NS	PP	Dispersion	N	NS	[64]
20 wt% N6	1 wt% TiO2	4 cm^2	*e.coli,* 0	NA	4	NA	Dispersion	N	NS	[65]
15 wt% PU	0.5 wt% TiO2	3.5 g	*p. aeruginosa*, ~15	*s. aureus*, ~10	2	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	0.5 wt% TiO2	3.5 g	*p. aeruginosa*, ~35	*s. aureus*, ~30	6	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	1 wt% TiO2	3.5 g	*p. aeruginosa*, ~25	*s. aureus*, ~20	2	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	1 wt% TiO2	3.5 g	*p. aeruginosa*, ~55	*s. aureus*, ~40	6	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	3 wt% TiO2	3.5 g	*p. aeruginosa*, ~30	*s. aureus*, ~30	2	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	3 wt% TiO2	3.5 g	*p. aeruginosa*, ~75	*s. aureus*, ~75	6	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	5 wt% TiO2	3.5 g	*p. aeruginosa*, ~35	*s. aureus*, ~40	2	NA	*In situ* synthesis	N	341	[66]
15 wt% PU	5 wt% TiO2	3.5 g	*p. aeruginosa*, ~85	*s. aureus*, ~80	6	NA	*In situ* synthesis	N	341	[66]
8 wt%PMMA	10 wt% ZnO/TiO2	1 mg	NS	*s. aureus*, 40	24	NA	*In situ* synthesis	N	100	[67]
15 w/w% PLA	1 wt% ZnO	**NS**	e. *coli*, 9	*s. aureus*, 0	24	NA	Dispersion	N	700	[68]
15 w/w% PLA	3 wt% ZnO	**NS**	*e. coli*, 26	*s. aureus*, 27	24	NA	Dispersion	N	710	[68]
15 w/w% PLA	5 wt% ZnO	**NS**	*e. coli*, 15	*s. aureus*, 95	24	NA	Dispersion	N	790	[68]
5 wt% PSf	0.1 wt% SWNTs	0.4 mg	*e. coli*, 18	NA	1	NA	Dispersion	N	256	[69]
5 wt% PSf	0.5% SWNTs	20 mg	*e. coli*, 60	NA	1	NA	Dispersion	N	274	[69]
5 wt% PSf	1.0% SWNTs	40 mg	*e. coli*, 76	NA	1	NA	Dispersion	N	293	[69]
2.7 w/v% CS	**0.75 wt% MX**	**1 mg**	*e. coli*, 95	***s. aureus*, 62**	**4**	**NA**	**Dispersion**	**GA**	298 ± 76	
12 wt% PLA	4 wt% CS	20 mg	*e. coli*, 52	NA	24	NA	Core/shell	N	236 ± 87	[70]
12 wt% PLA	4 wt% CS	20 mg	*e. coli*, 44	NA	24	NA	Core/shell	N	303 ± 165	[70]
12 wt% PLA	4 wt% CS	20 mg	*e. coli*, 22	NA	24	NA	Core/shell	N	396 ± 336	[70]

15 wt% PET	4 wt% CS	0.4 g	*k. pneumoniae*, 40	*s. aureus*, 55	18	PET	Blending	N	500-800	[31]
	100% CS	1 mg	*e. coli*, 30.5	*s. aureus*, 3.5	4	N	Blending	NaOH	211±40	