Supplementary file

Preparation and assessment of agar/TEMPO-oxidized bacterial cellulose cryogels for hemostatic applications

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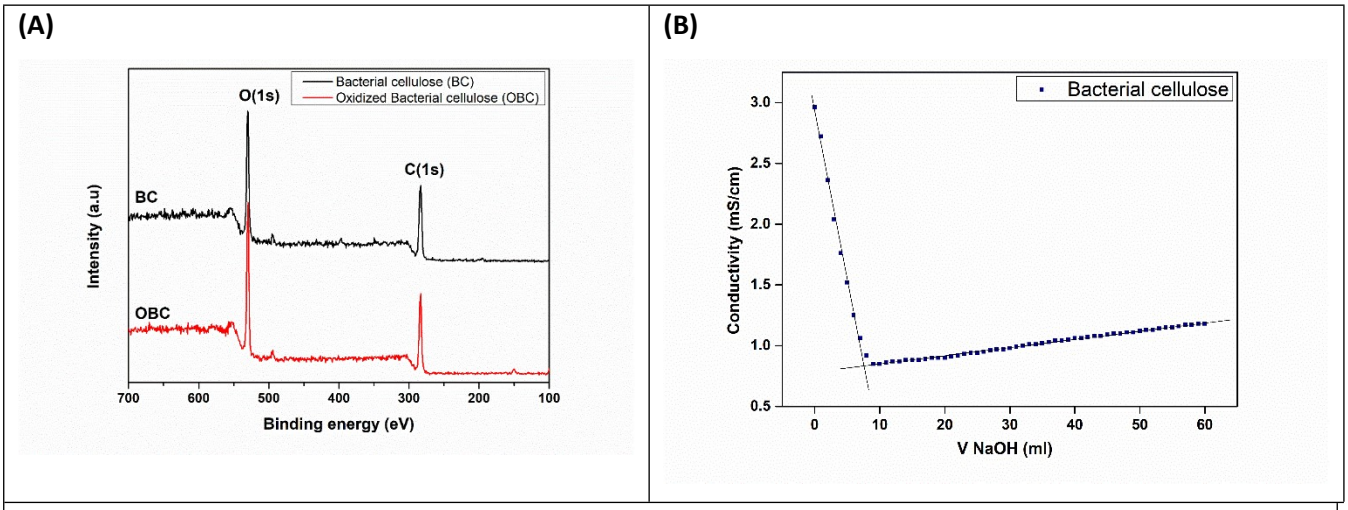

Figure S1: (A) XPS survey spectra of BC and OBC (B) Conductometric titration curve of BC sample titrated against NaOH (0.01 M).

(A)	(B)

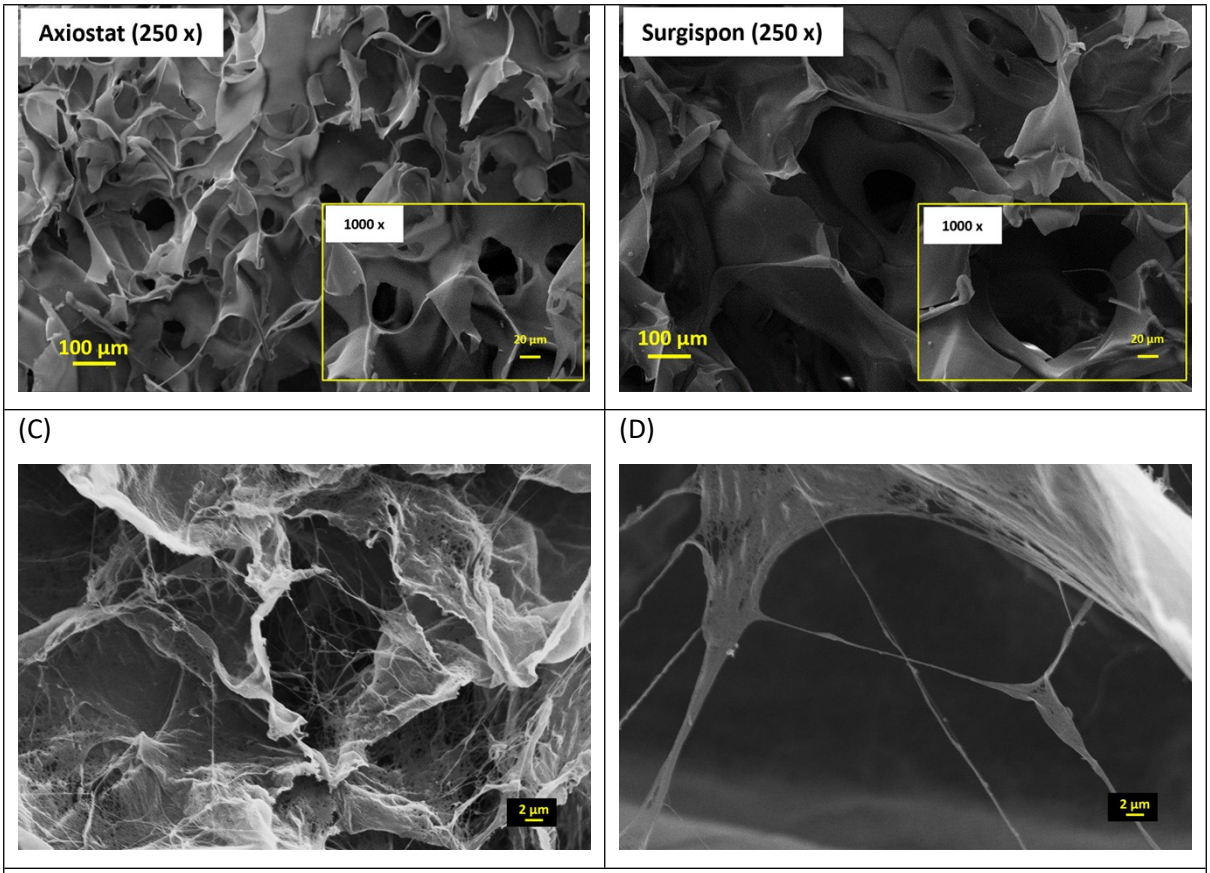

Figure S2: SEM images of commercial hemostats and oxidized bacterial cellulose (A) Axiostat hemostat (B) Surgispon hemostat. (C, D) OBC at higher magnification (5000×).

Table 1: Composition of agar/OBC cryogels

Cryogels	DI (mL)	Agar		OBC	
		Wt. %	Amount (mg)	% (w/w)	Amount (mg)
1% Agar	20	1	200	-	-
1%A_20%OBC	20	1	200	20	40
1%A_30%OBC	20	1	200	30	60
1%A_40%OBC	20	1	200	40	80

Table 2: Band areas of C(1s) peaks for the BC and OBC sample.

Bonds	BC		OBC	
	Peak position	Area	Peak position	Area
C-OH	286.52	**2069.11**	286.52	**1816.94**
C-C/C-H	284.82	974.36	284.83	916.71
O-C-O	288.15	751.76	287.90	766.26
C=O/O-C=O	-	-	**289.26**	**117.53**

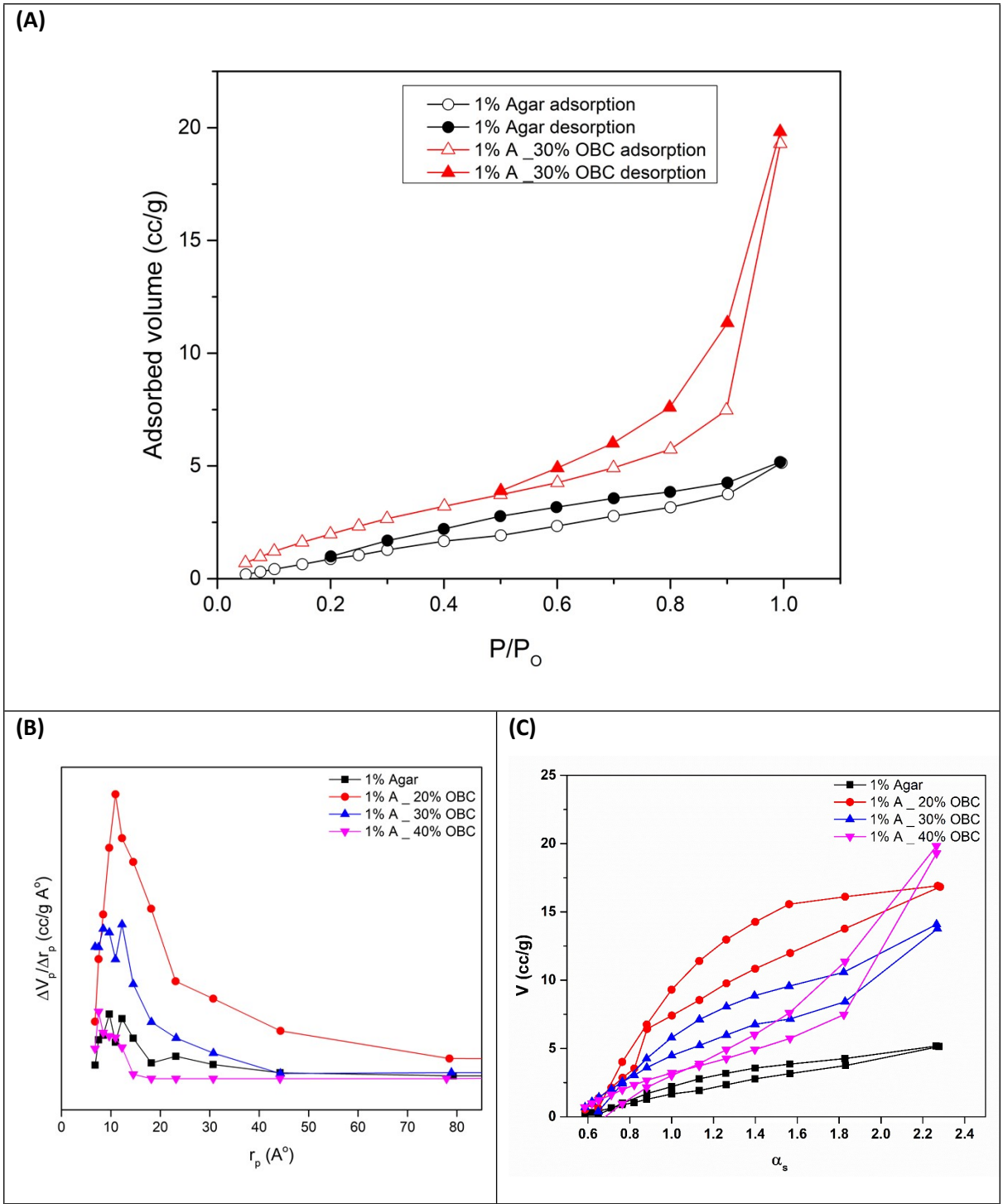

Figure S3: (A) N_2 adsorption isotherm of 1%agar and 1%agar_30%OBC samples. (B) Pore size distribution of the samples by BJH method (C) Aplha-s plot for nitrogen adsorption isotherm of cryogels.

(A)	(B)

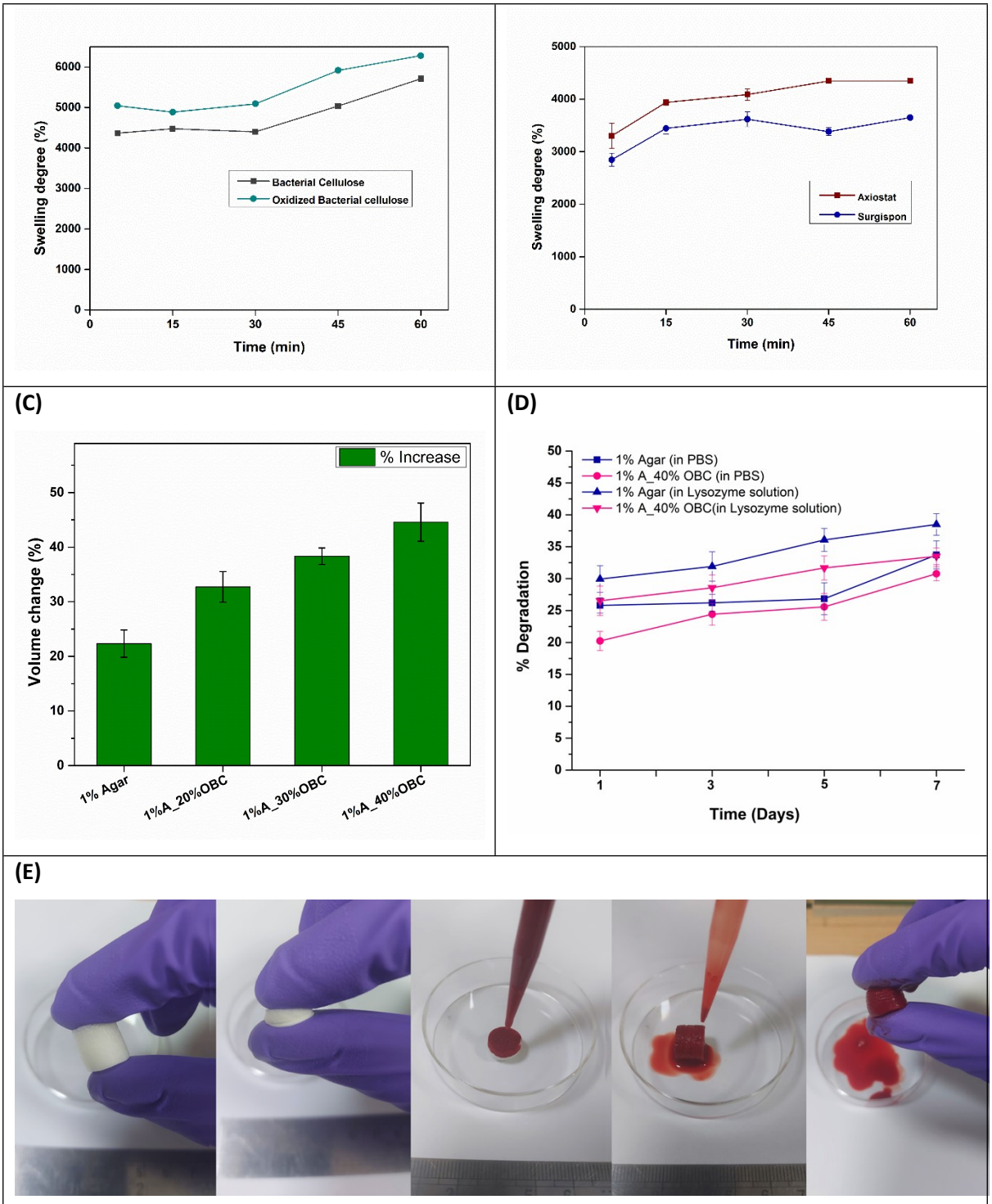

Figure S4: (A) Swelling degree of BC and OBC (B) Axiostat and Surgispon. C) Volume change (%) of cryogels when dipped in water for 60 min.(D) Degradability of test cryogels in PBS and lysozyme solution. (E) The stability of the cryogels in blood was assessed by compressing the cryogel and observing its recovery upon the addition of blood.

(A)	(B)

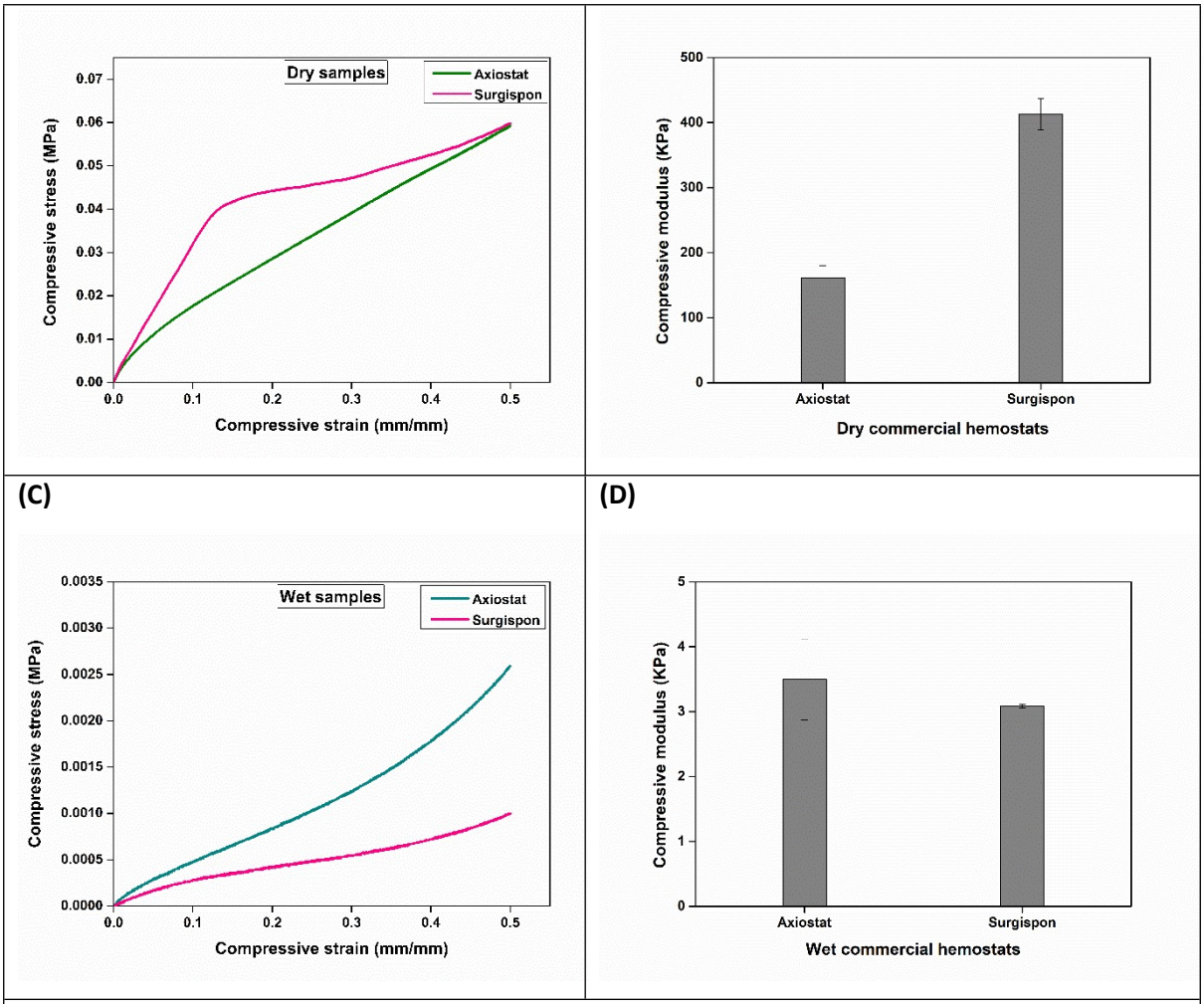

Figure S5: (A) compressive strength and (B) Compressive modulus of commercially available Axiostat and Surgispon in dry state. (C) and (d) Compressive strength and compressive modulus of cryogels in wet state.

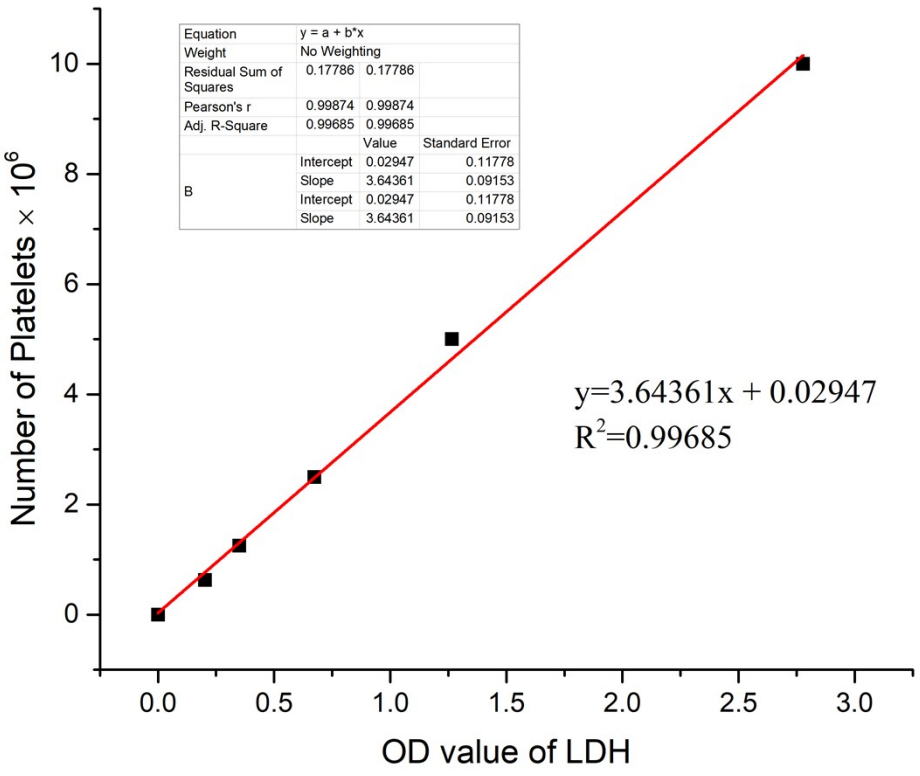

Figure S6: Calibration curve of the LDH assay. The curve shows good correlation (R^2=0.996) between the platelet counts and optical density value.

Table 3: Comparative analysis of hemostatic work- assessing *in vitro* and *in vivo* results.

Material	***In vitro* hemostatic study**	***In vivo* hemostatic study**	**Ref.**
Agar/oxidized bacterial cellulose cryogels	Complete clotting in 120 s	In rat liver injury model, shortest hemostatic time was 35 s. In rat tail amputation model, shortest time was 64 s.	work
Alginate/ oxidized cellulose nanocrystal sponges	Not performed	In rabbit liver injury model, shortest hemostatic time was ~76 s. In ear artery injury, the time was ~70 s.	[1]
Quaternized chitosan/carbon nanotube (CNT) cryogels	Lowest BCI of 10% in 150 s.	In mouse liver injury model, lowest hemostasis time was ~80 s. In tail amputation model, hemostatic time varies from 117 to 60 s.	[2]

Quaternized chitosan/mesoporous bioactive glass (MBG) cryogels	Lowest BCI of ~10% in 5 min.	For rat liver prick injury model, shortest hemostasis time of ~71 s. In penetrating liver defect model, hemostasis time was ~46 s.	[3]
Gelatin/ polydopamine cryogels	Best sample with15% BCI in 150 s.	In mouse-tail amputation model, shortest hemostatic time of 37s. For mouse liver trauma model, shortest hemostatic time of 62 s. For the rat liver incision model, shortest hemostatic time of 73 s. The rabbit liver cross incision model, shortest hemostatic time of 82 s.	[4]
Poly (vinyl alcohol) (PVA), Carboxymethyl chitosan (CMCS) and Dopamine (DA) cryogels	Best sample with 20% BCI in 120 s.	For mouse liver trauma model, the shortest hemostatic time of 2.2 min and blood loss of 128 mg. In rat liver incision model, hemostatic time of 1.7 min and blood loss of 194 mg.	[5]
Polyurethane/hyaluronic acid cryogels	Blood clotting time of 2 ± 2 min.	In rat liver hemorrhage model, hemostasis time of 72 ± 15 s and blood loss of 80 ± 23 mg.	[6]
Carboxymethyl chitosan/poly(N-isopropylacrylamide) (CMCS/PNIPAM)	BCI 20-25% for clotting time of 30 seconds. Samples are tested with 50 µL.	In mouse liver trauma model, the amount of blood loss in C/N/MPA10 group was 52.6 mg and shortest hemostasis time of ≈198 s.	[7]

References

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