

MULTIFUNCTIONAL NANOCELLULOSE COMPOSITE WOUND DRESSINGS

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Introduction

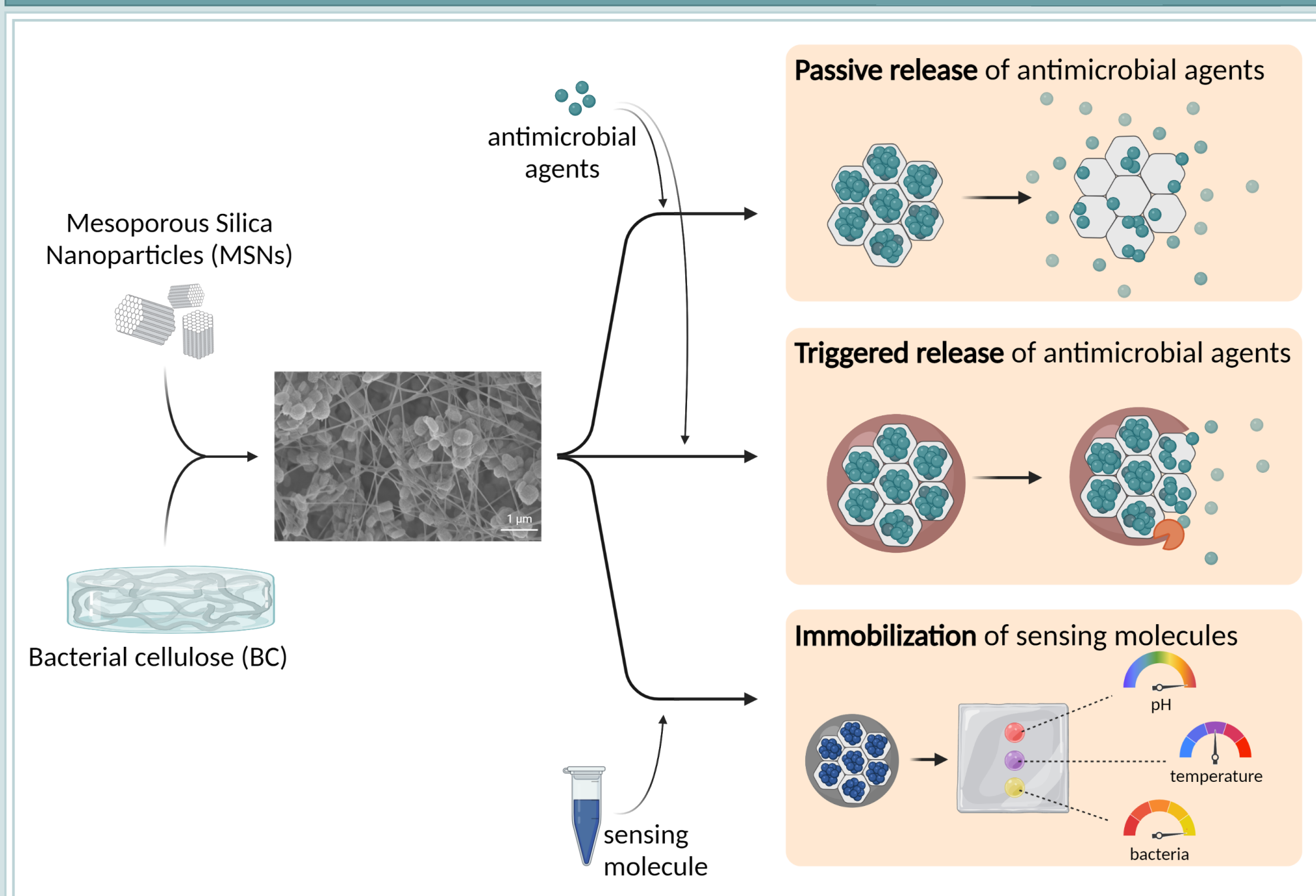
- **Wound infections** are often hard to eradicate and can contribute to wound chronification.
- The healing time of **chronic wounds** protracts from the normal 6 weeks up to several months or even years.
- Early-stage **detection** and **treatment** of wound infections is thus of key importance for managing this highly overlooked issue and facilitate healing.

Objective

Development of a **high surface area** wound dressing material capable of **augmented loading** of:

- sensing components → wound status monitoring
- antimicrobial compounds → eradication of infection

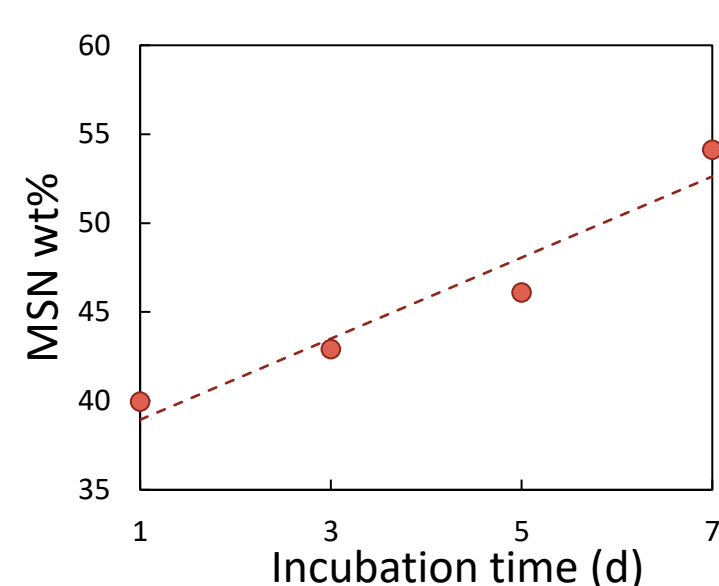
Applications



Conclusions

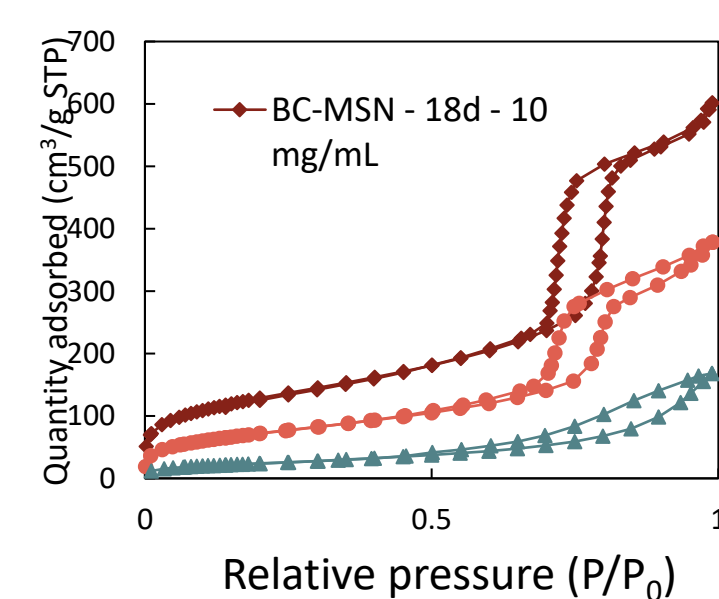
- **Robust** procedure allowing **high control** over dressing properties
- **Simple** and **scalable** production process
- Moisture retention and transmission, dressing **conformability** and **transparency** retention post MSN loading
- Dressing **versatility** to create multifunctional wound dressings

Results



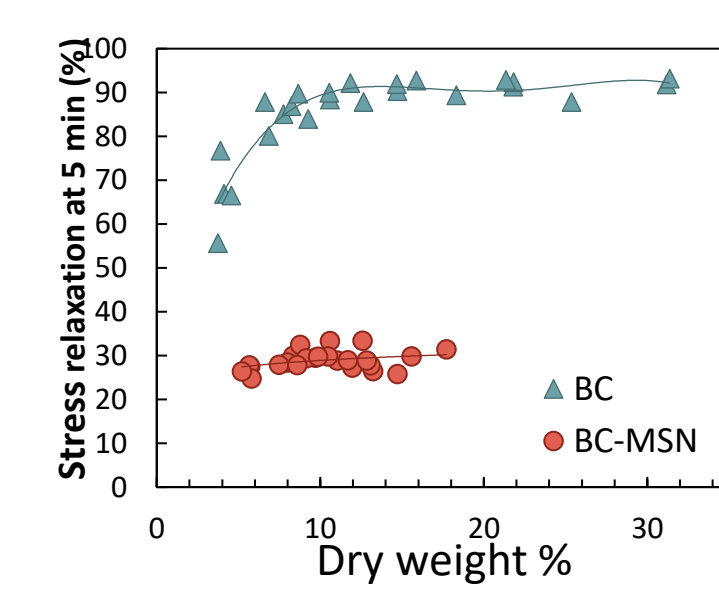
MSN loading is dependent on MSN concentration and incubation time

Figure 1: Dry weight % of MSN in BC membrane after incubation of BC in MSN suspension (5 mg/mL) for different times.



MSNs loading → substantial increase in specific surface area (88 m²/g → 265 m²/g → 469 m²/g)

Figure 2: BET surface area plot of BC and BC-MSN incubated in 5 mg/mL MSN for 5 days and 10 mg/mL for 18 days, respectively.



MSN incorporation → enhanced compressive strength

Figure 3: Rheological characterization of BC and BC-MSN (5d, 5 mg/mL) under compression-relaxation test.

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 Figures were created with BioRender.com.



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