Enhancing tumor-targeting bacteria efficacy via smart polymer shield encapsulation

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CONTROLLED RELEASE SOCIETY
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INTEGRATING
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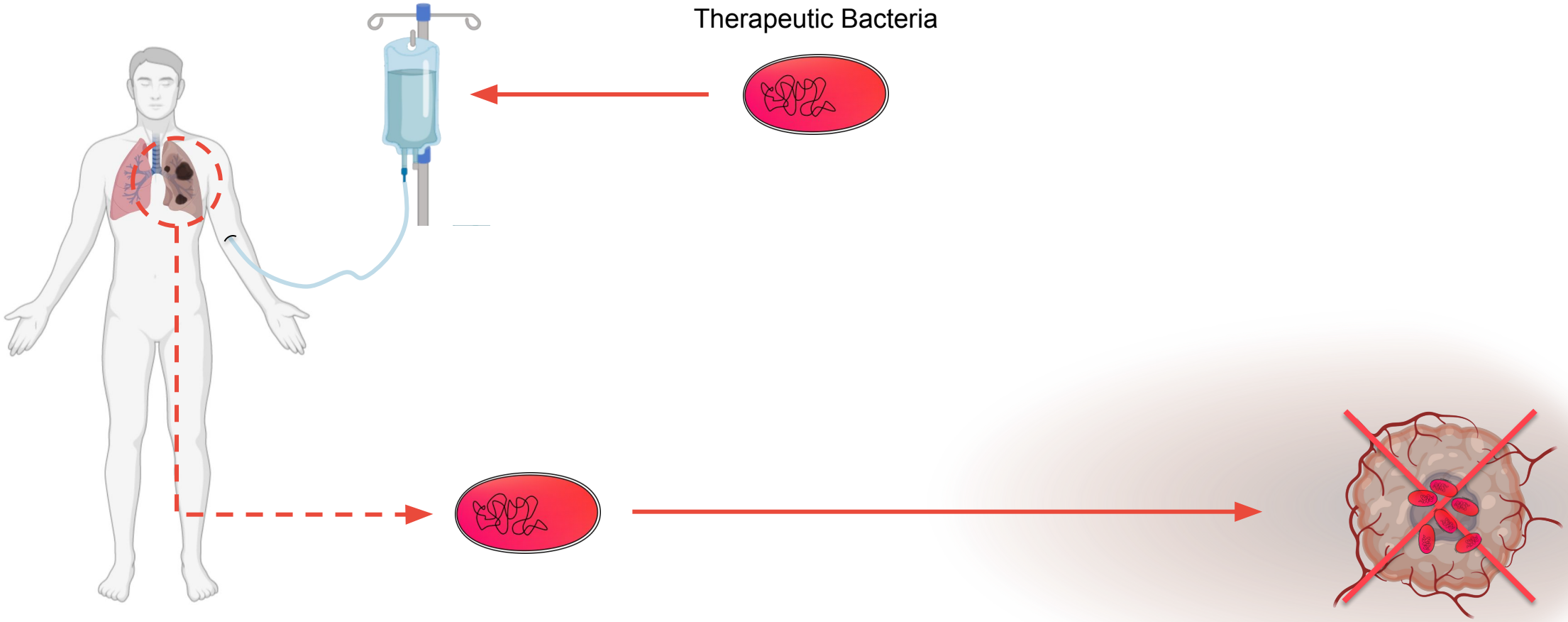
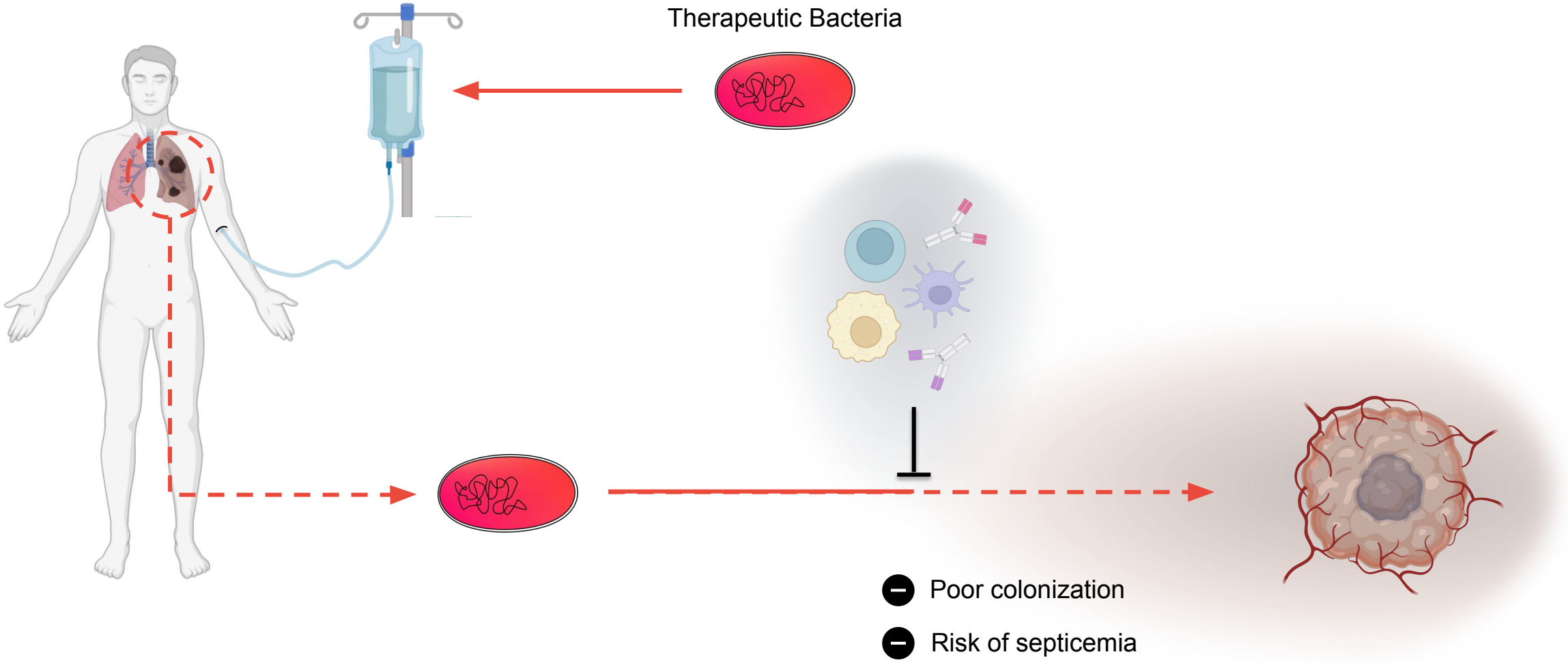
ACROSS DISCIPLINES

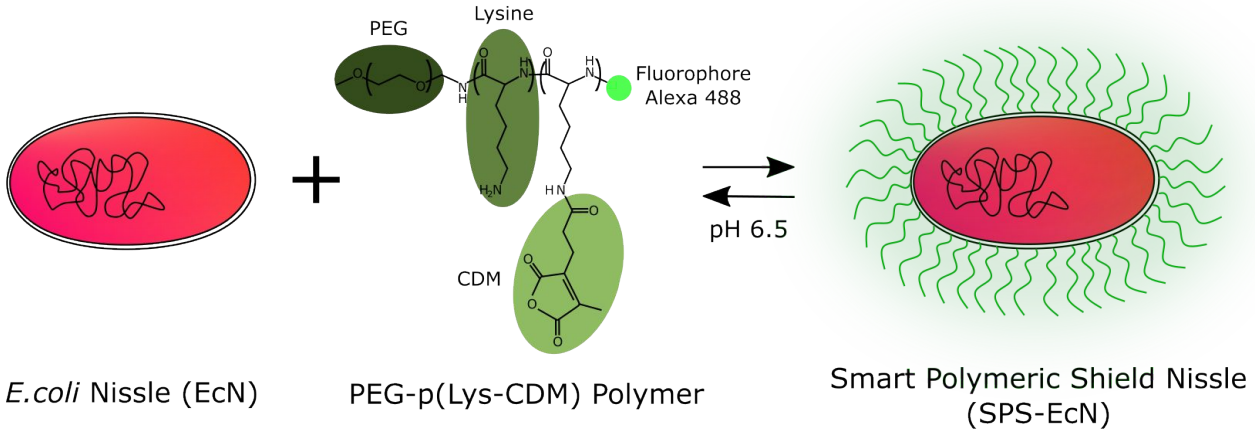
Anti-tumoral Bacterial Therapies



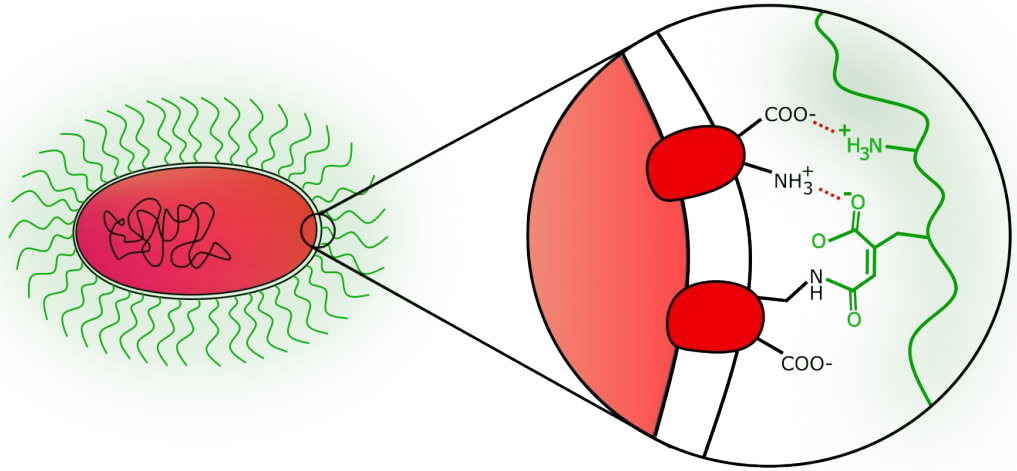
Anti-tumoral Bacterial Therapies



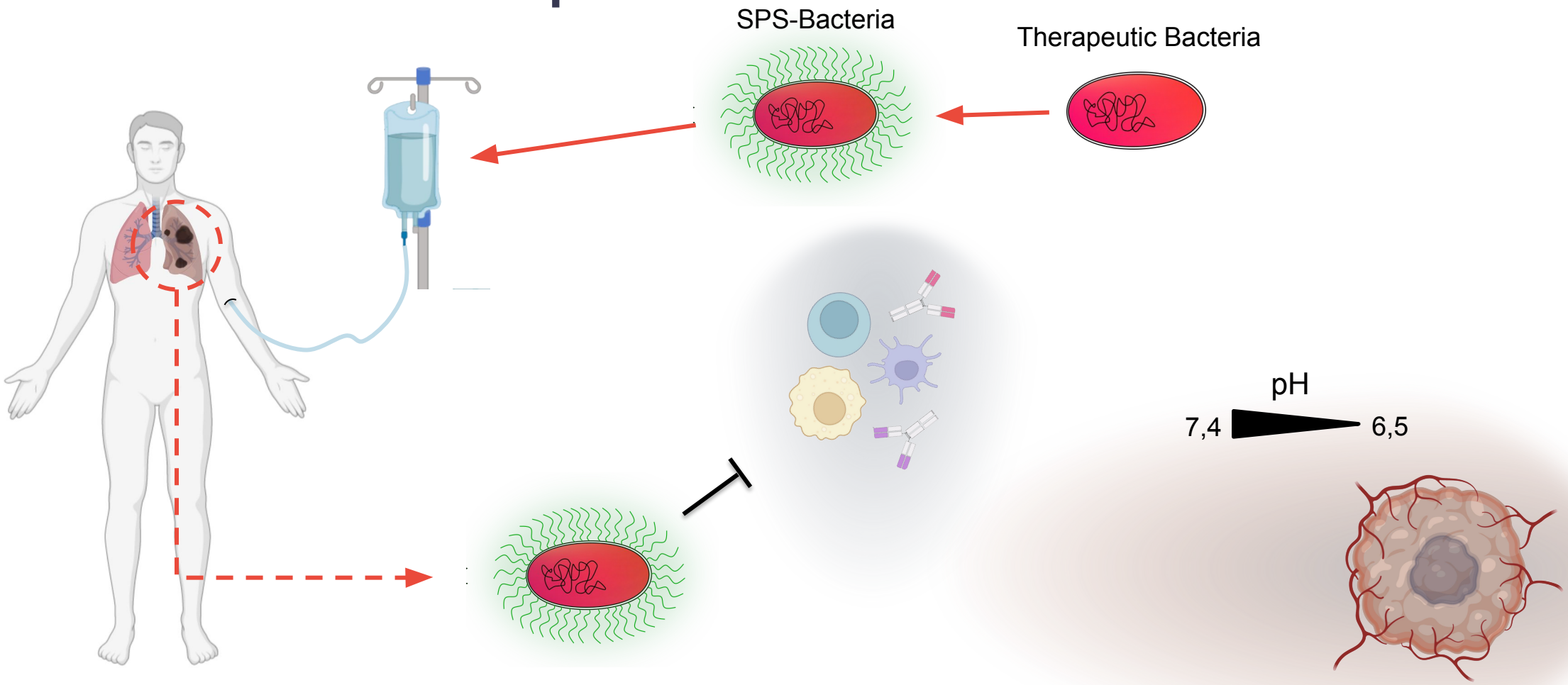
The Smart Polymeric Shield Encapsulation (SPS)



Horacio Cabral
Tokyo, Japan



The SPS-Bacteria concept



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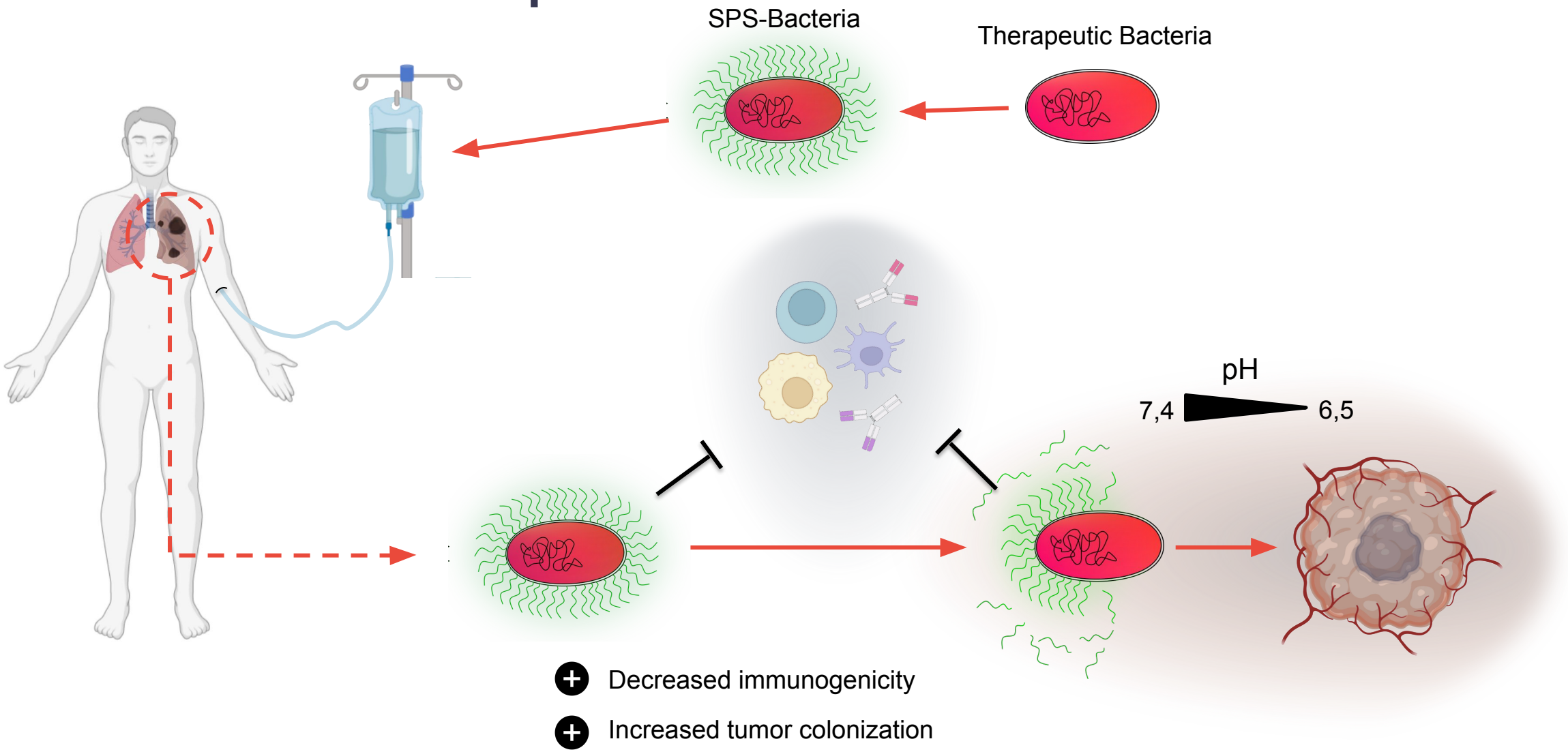
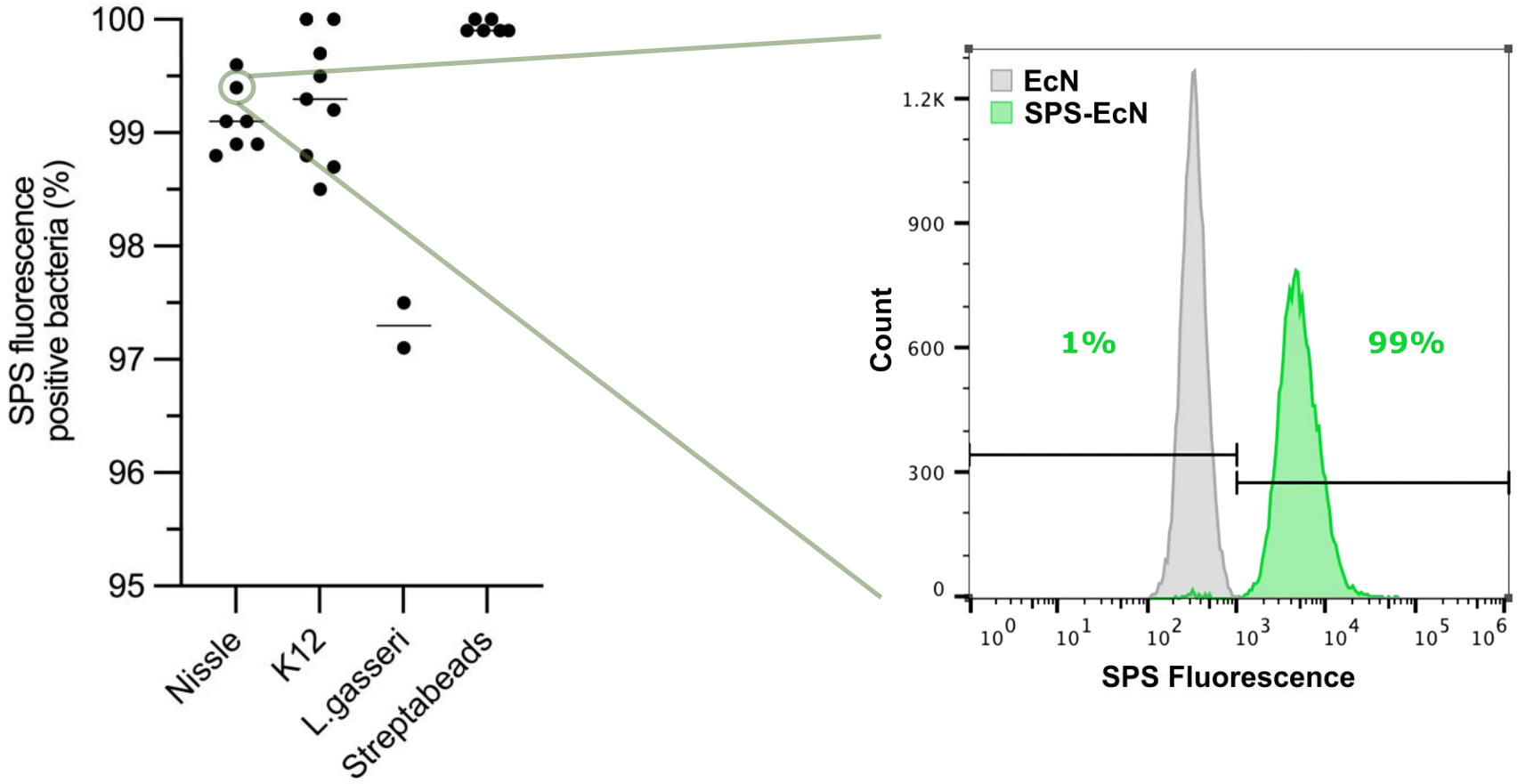


- Decreased immunogenicity
- Increased tumor colonization

SPS fully coat 99% of bacterial population



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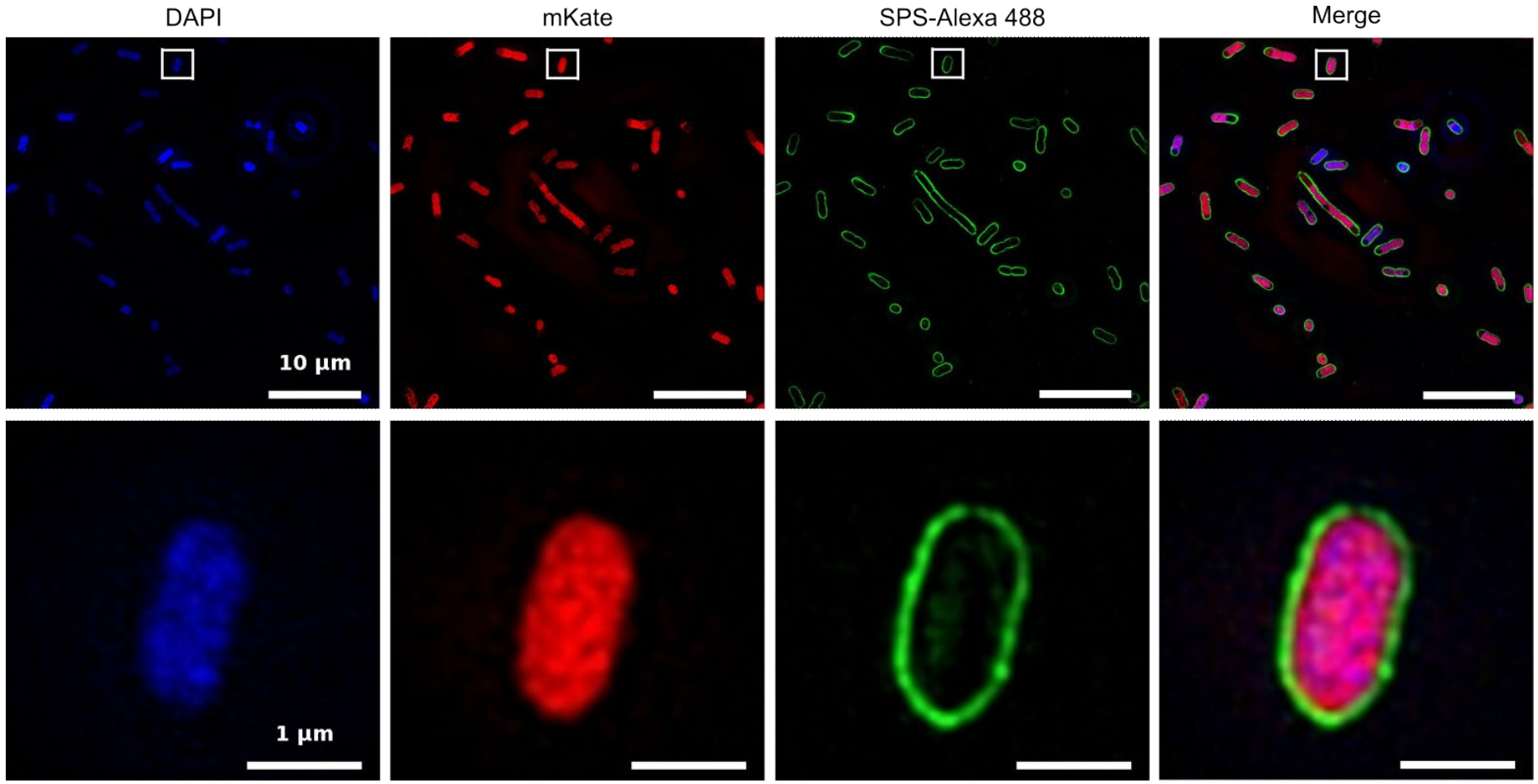
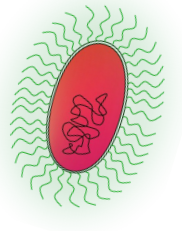
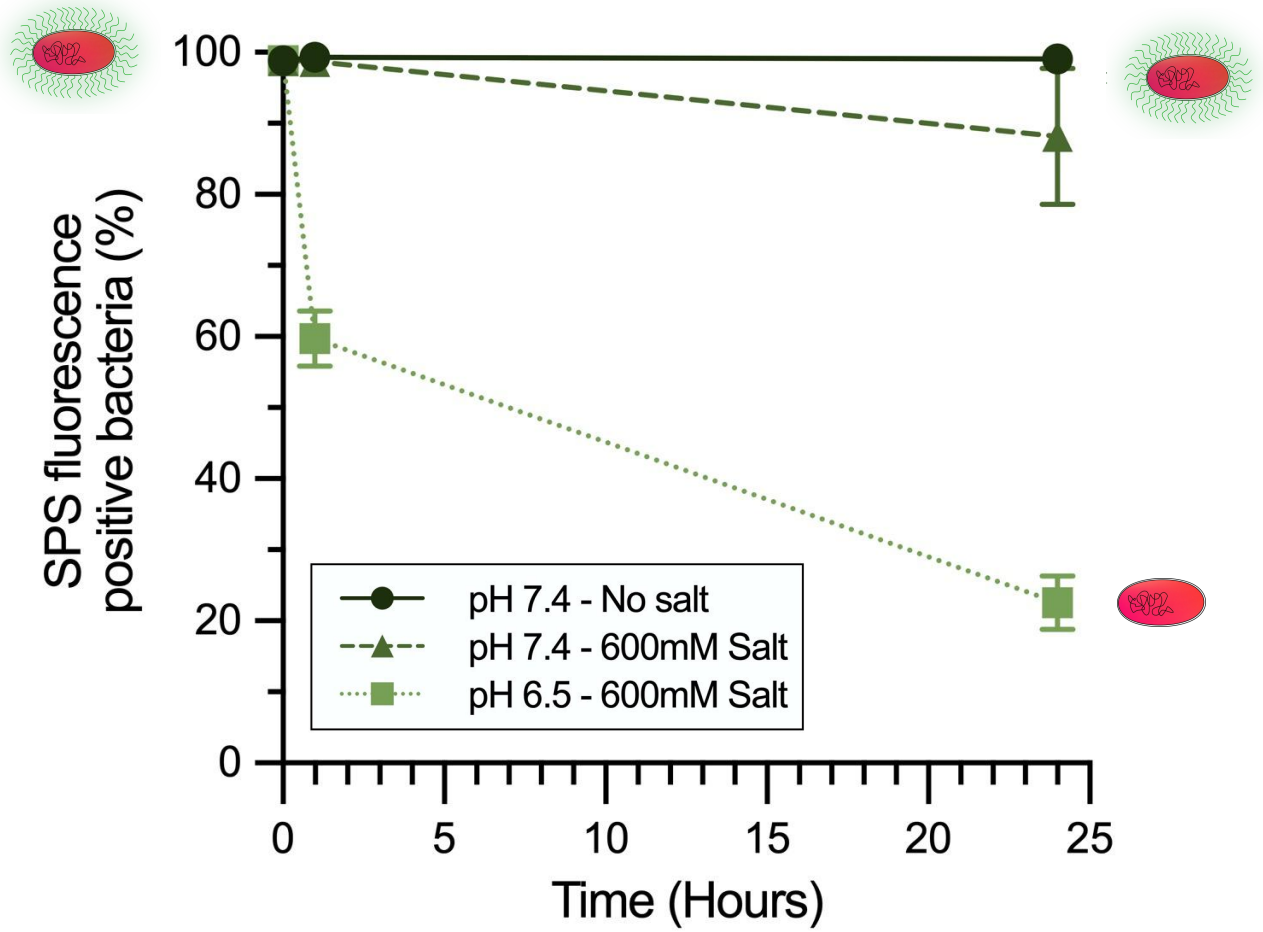
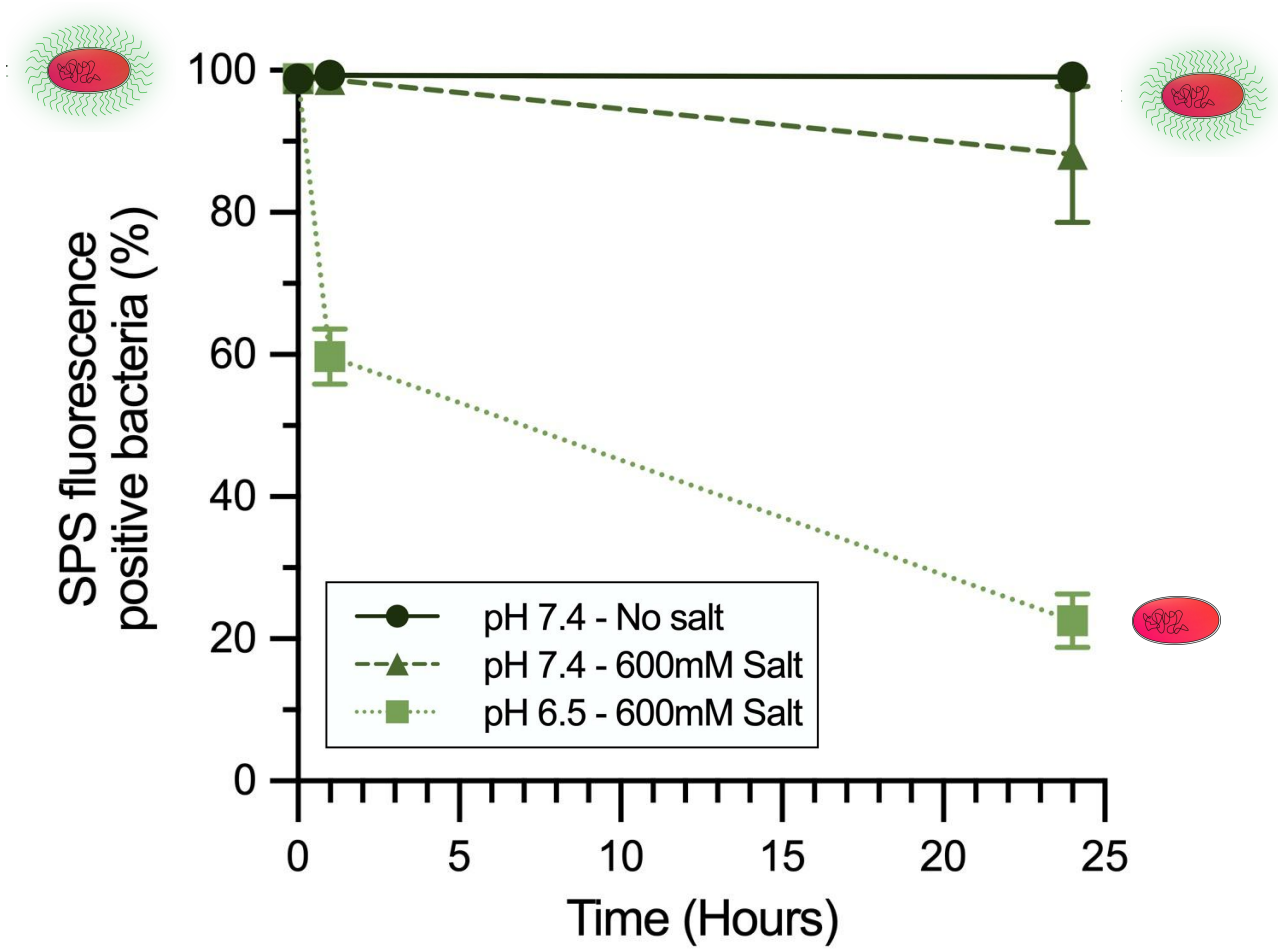


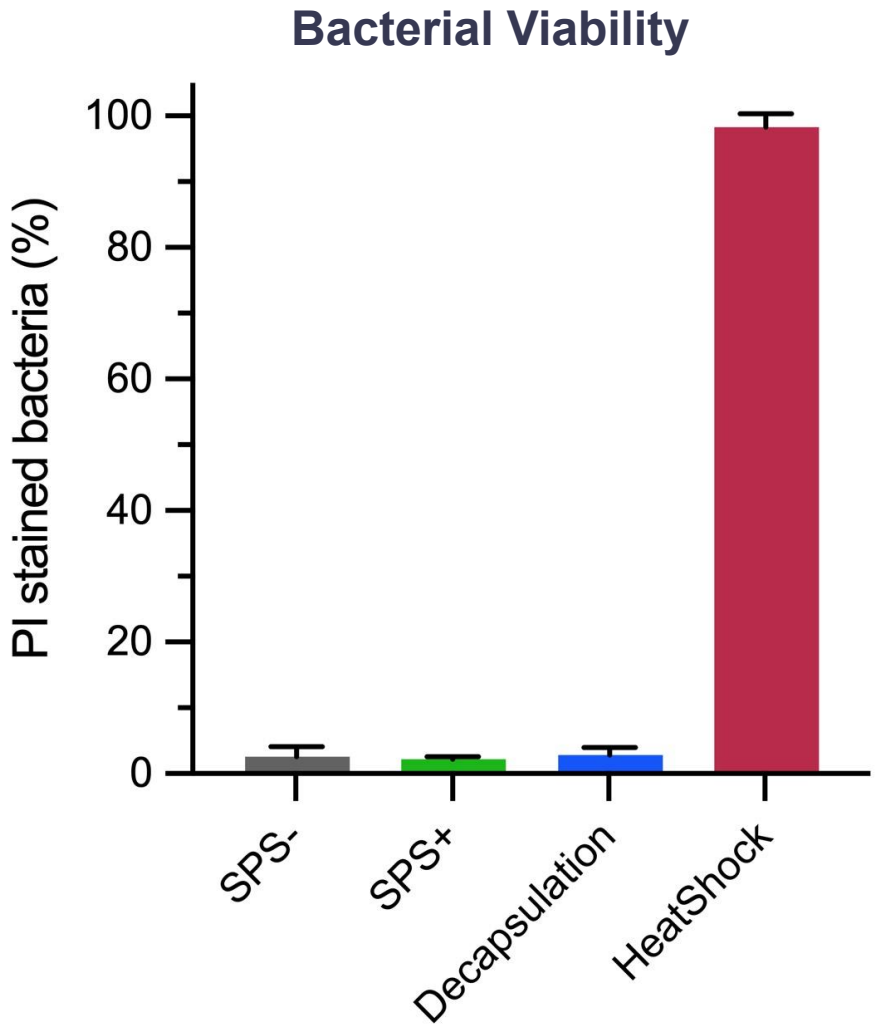


SPS coating is reversible at pH 6.5

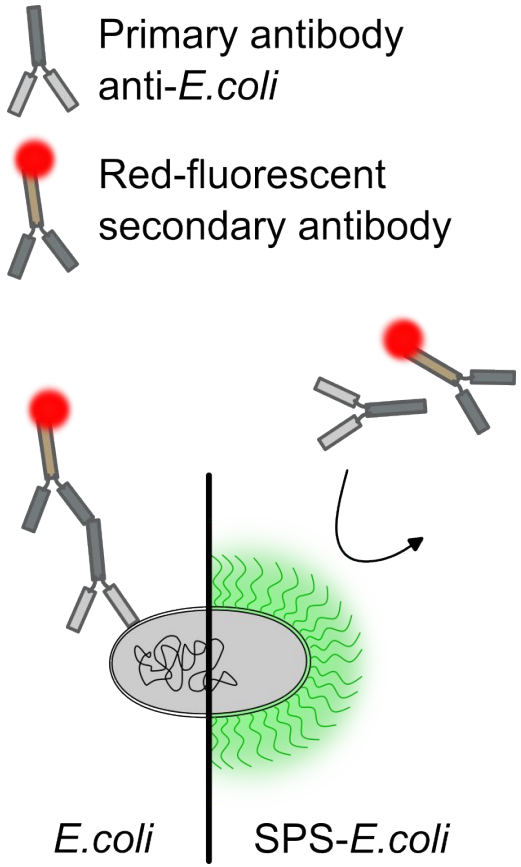


SPS coating do not affect bacterial viability





SPS coating block 99% of antibody recognition



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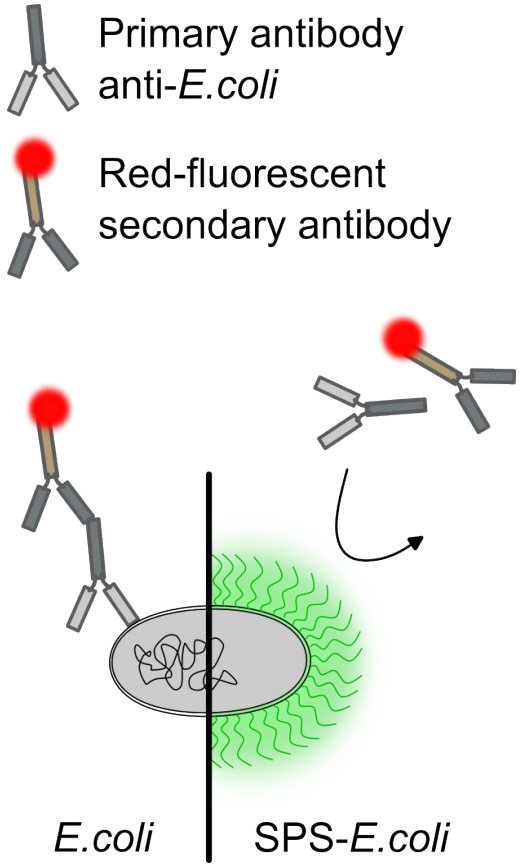
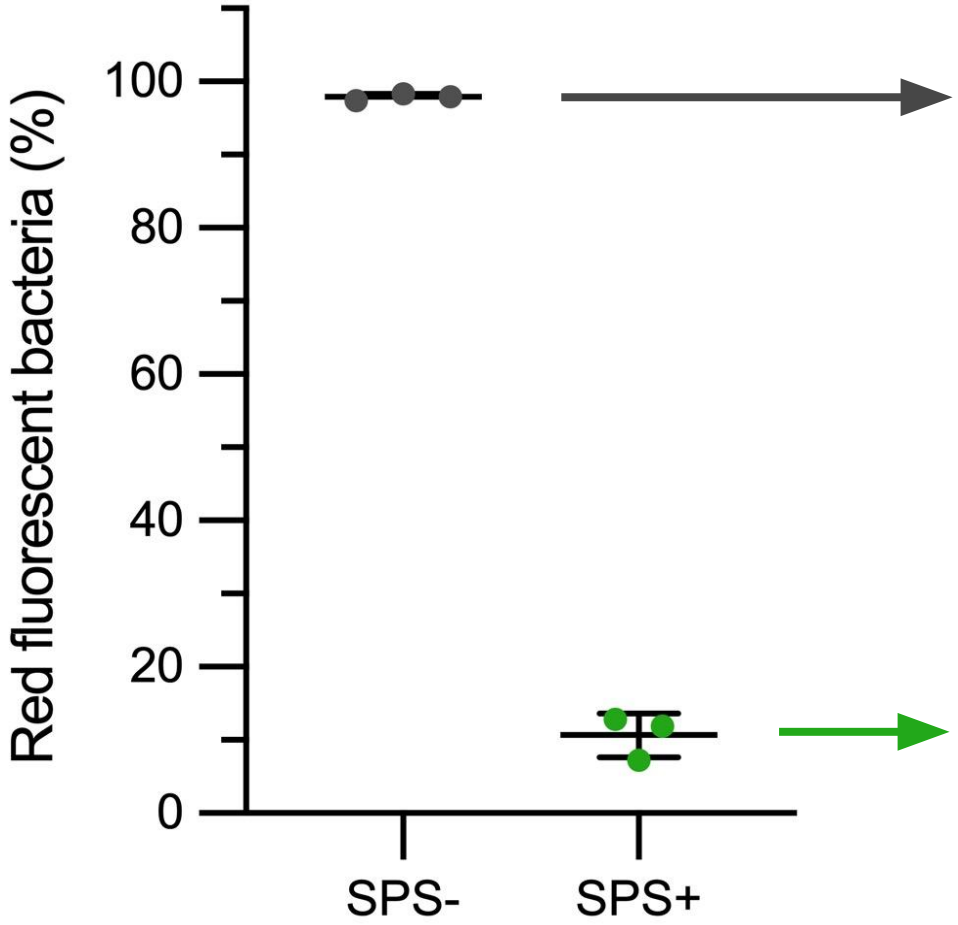
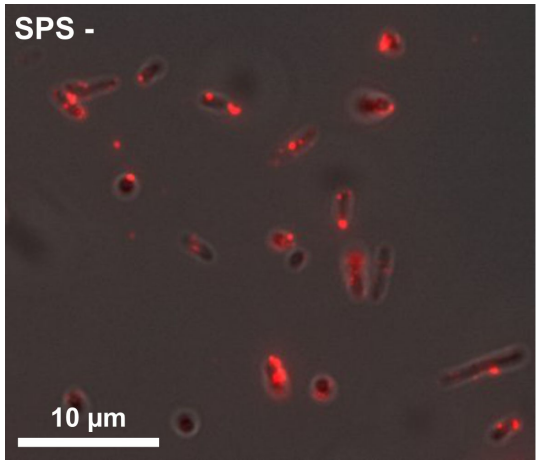
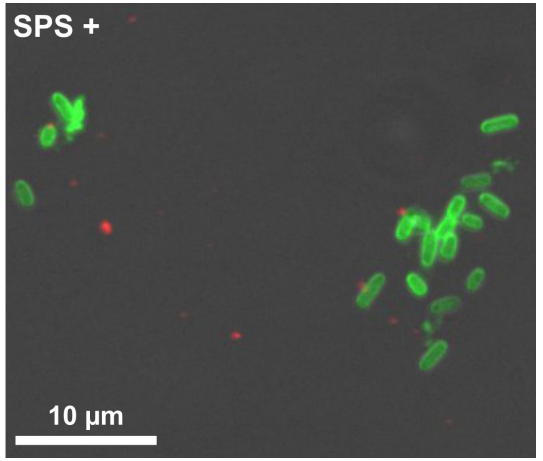
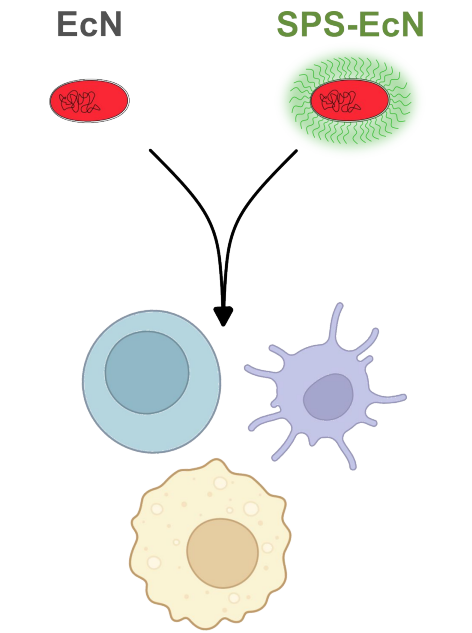


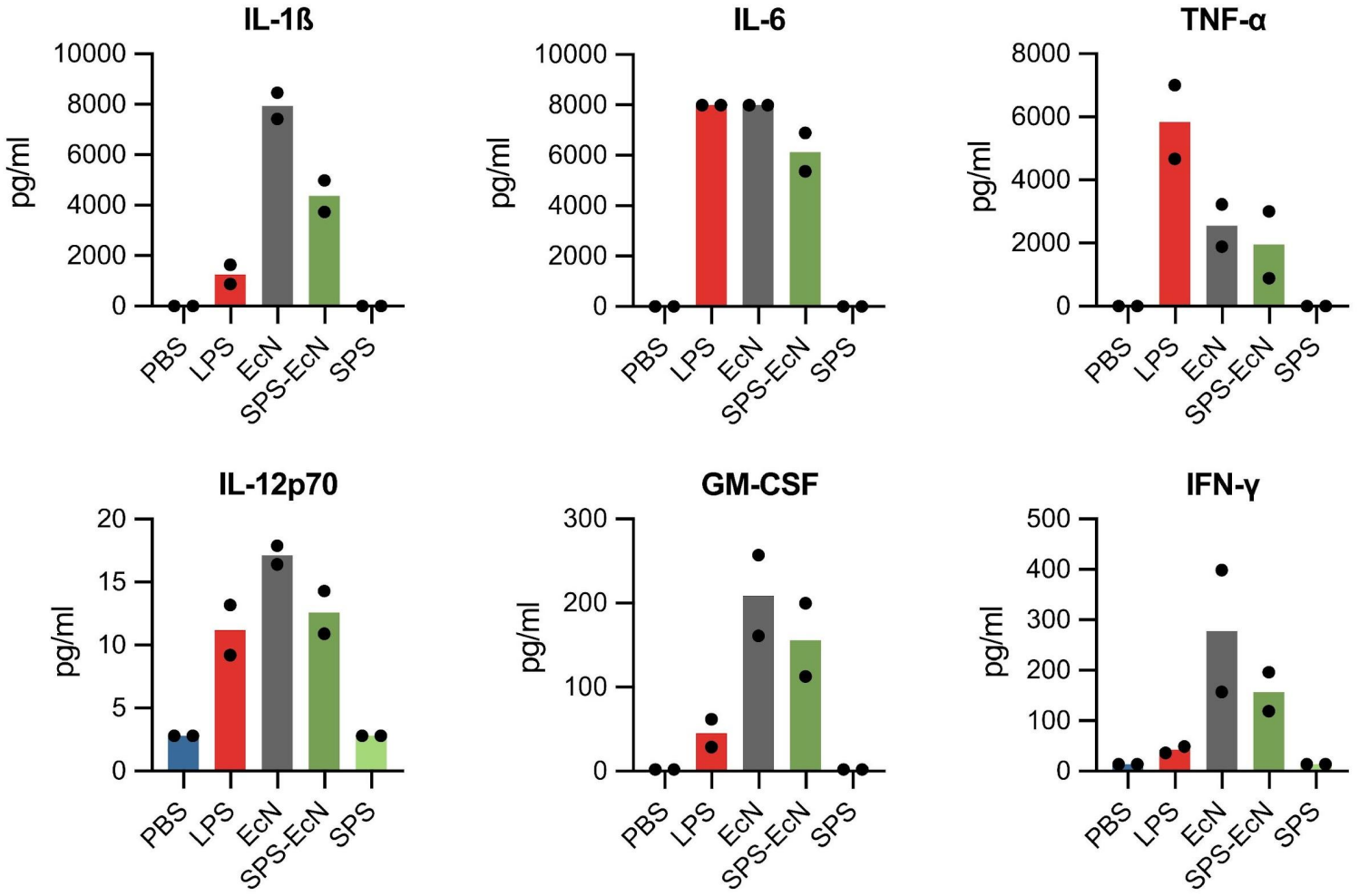






SPS-Bacteria decreases cytokines-based immune response *in vitro*





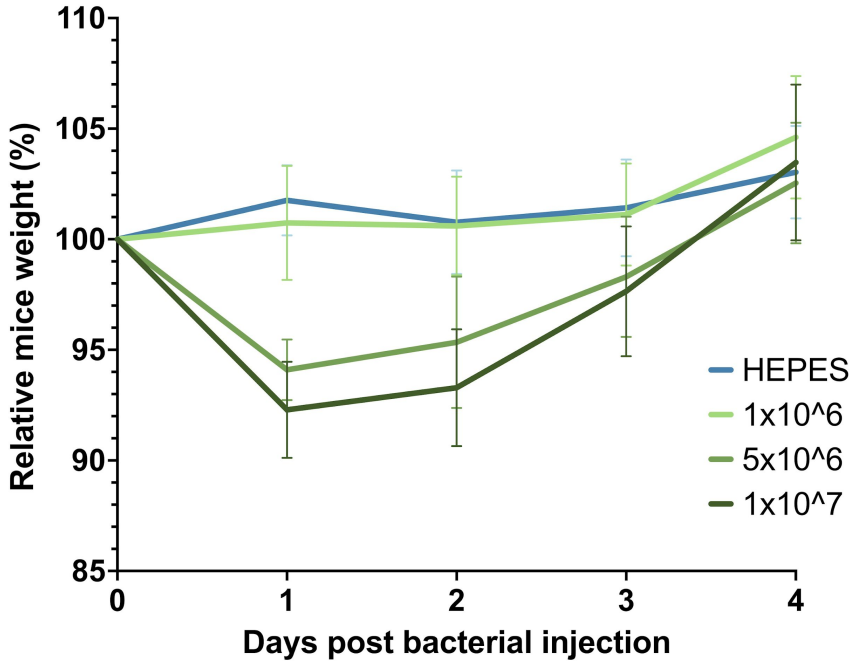
In vivo SPS characterization experimental plan

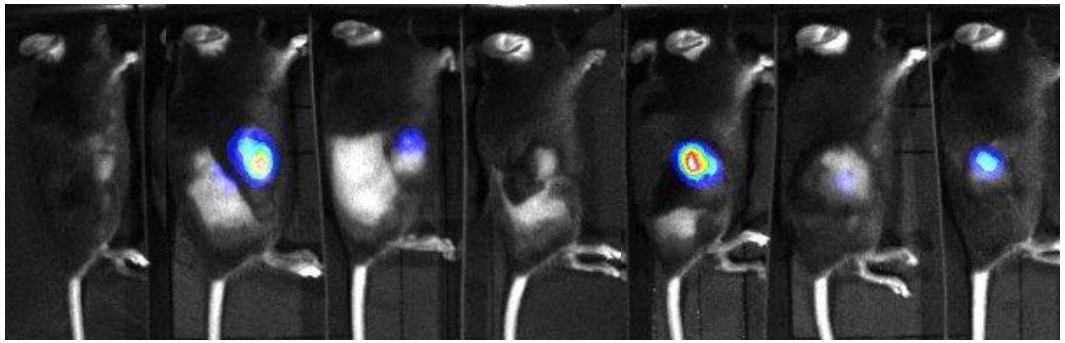
MC38 mouse colorectal carcinoma graft

Systemic bacterial injection (i.v.)

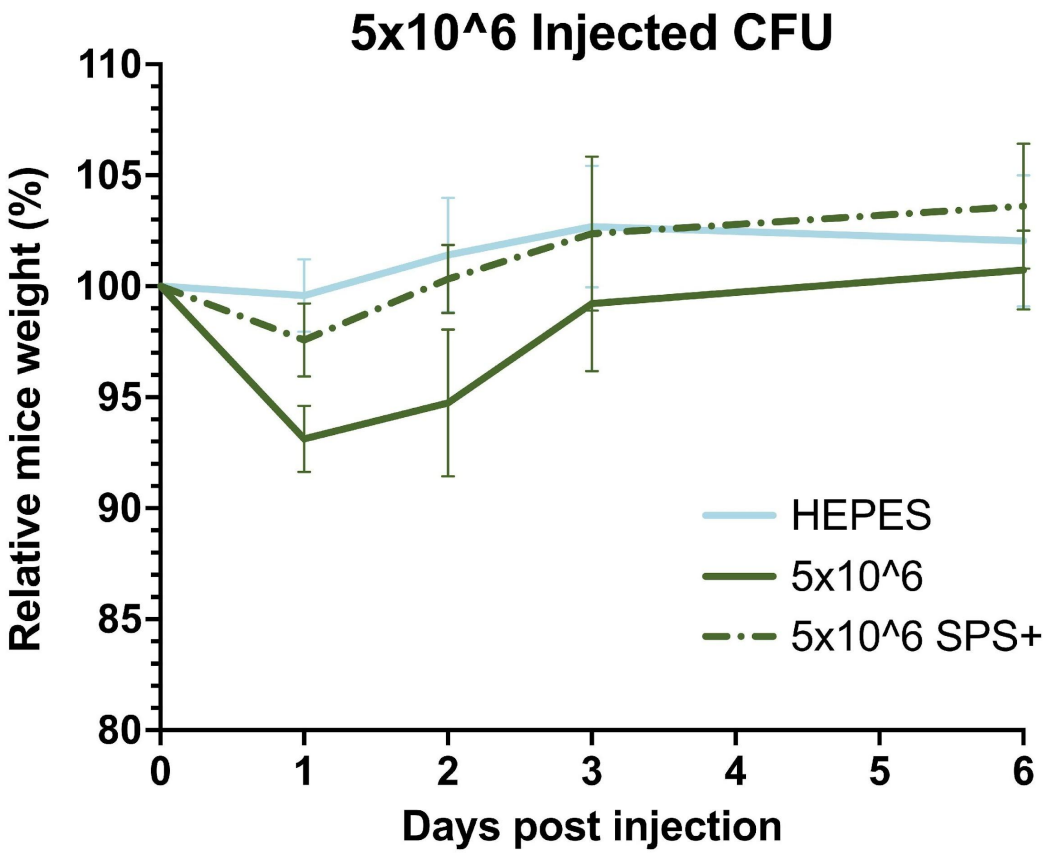
Mice weight monitoring
Bioluminescence monitoring

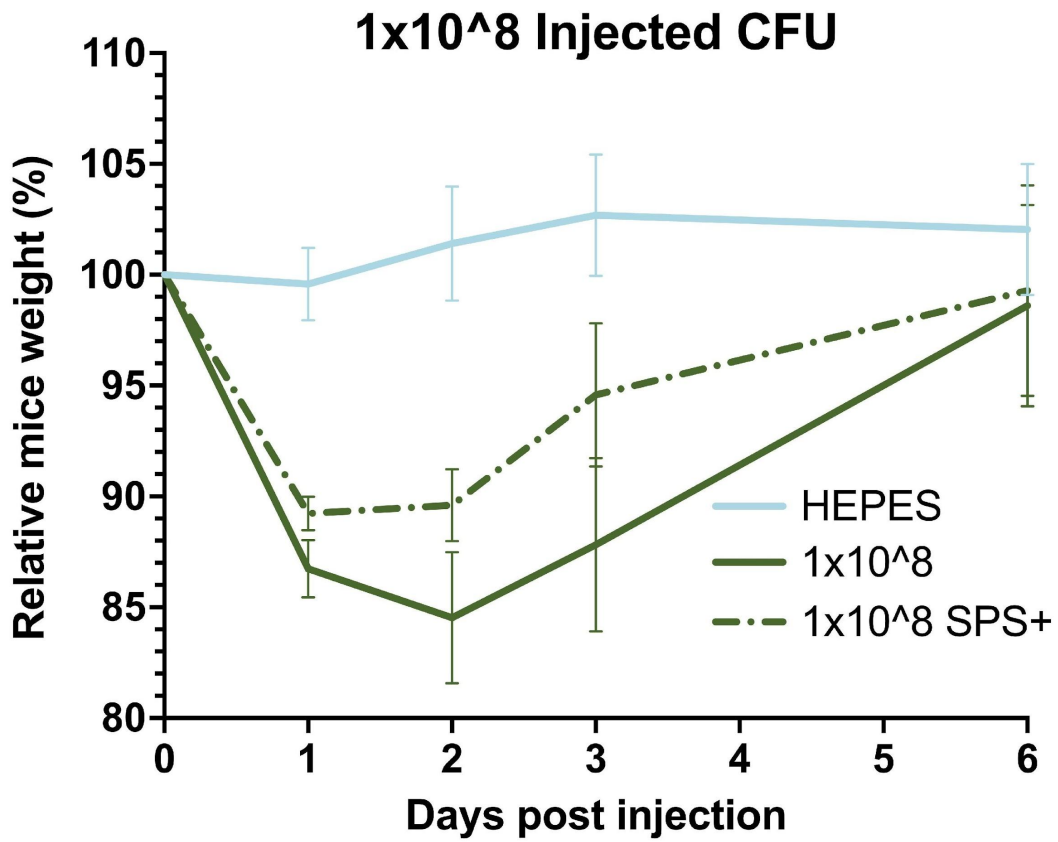
Tumor retrieval
CFU quantification





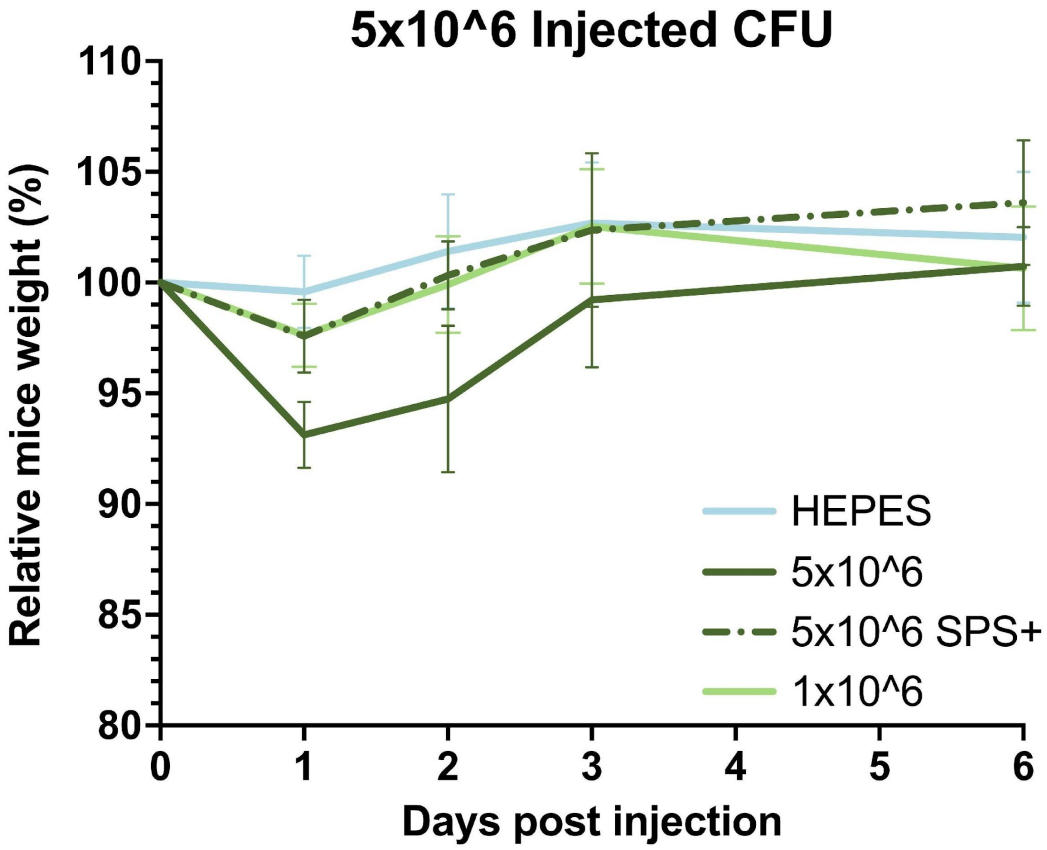
SPS significantly reduces mice weight loss post bacterial injection

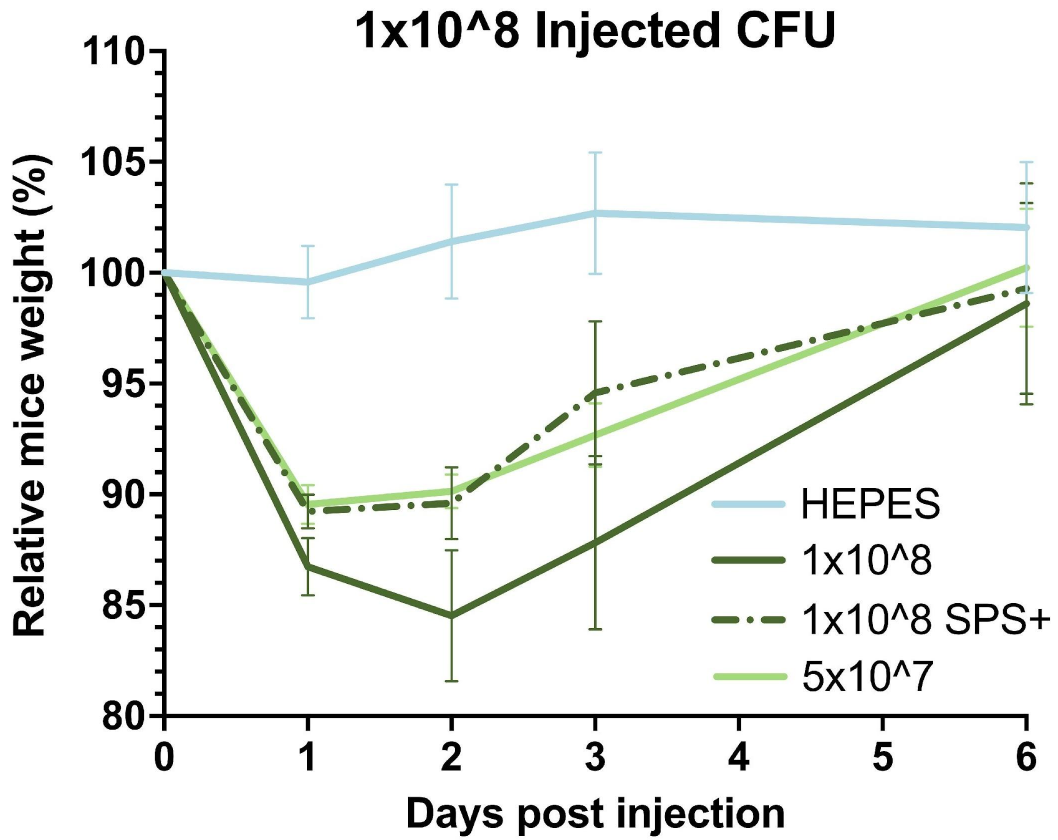




- SPS encapsulated bacteria promotes decreased weight loss post systemic injection in immunocompetent mice

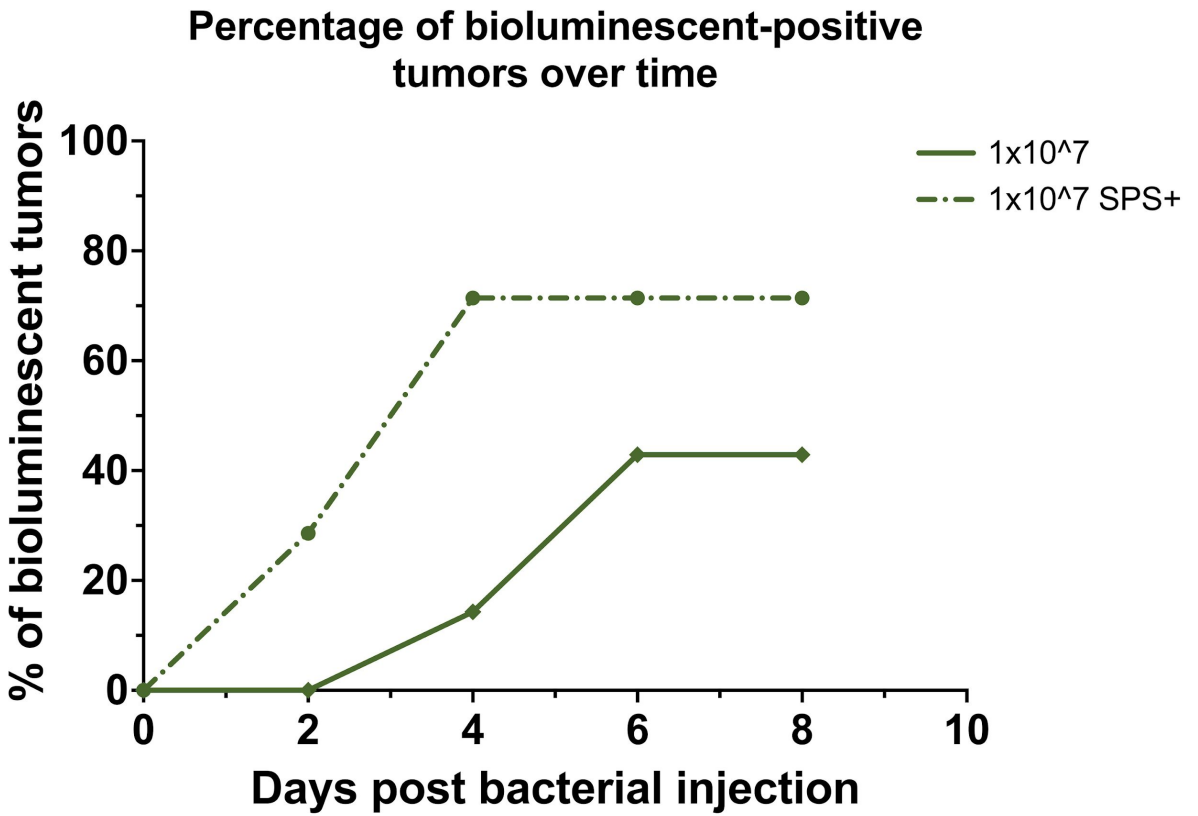
SPS significantly reduces mice weight loss post bacterial injection

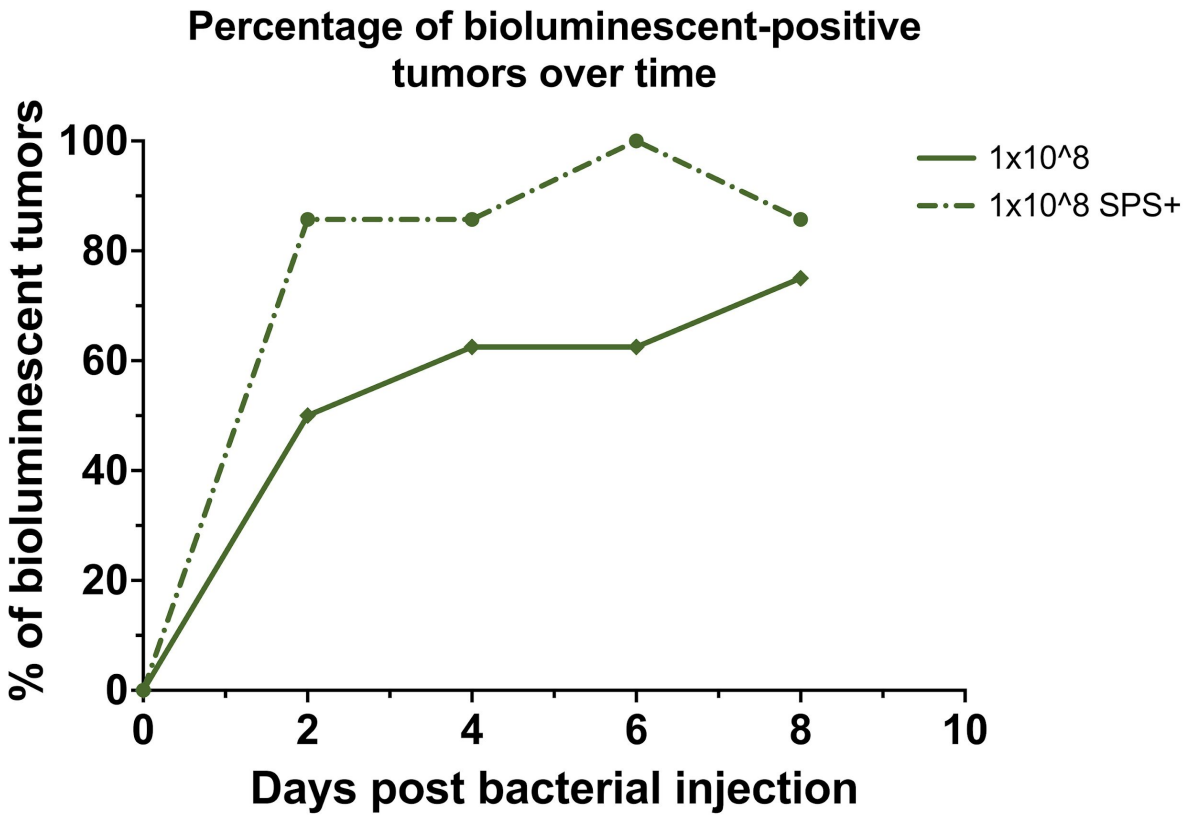




⊕ SPS encapsulated bacteria promotes decreased weight loss post systemic injection in immunocompetent mice

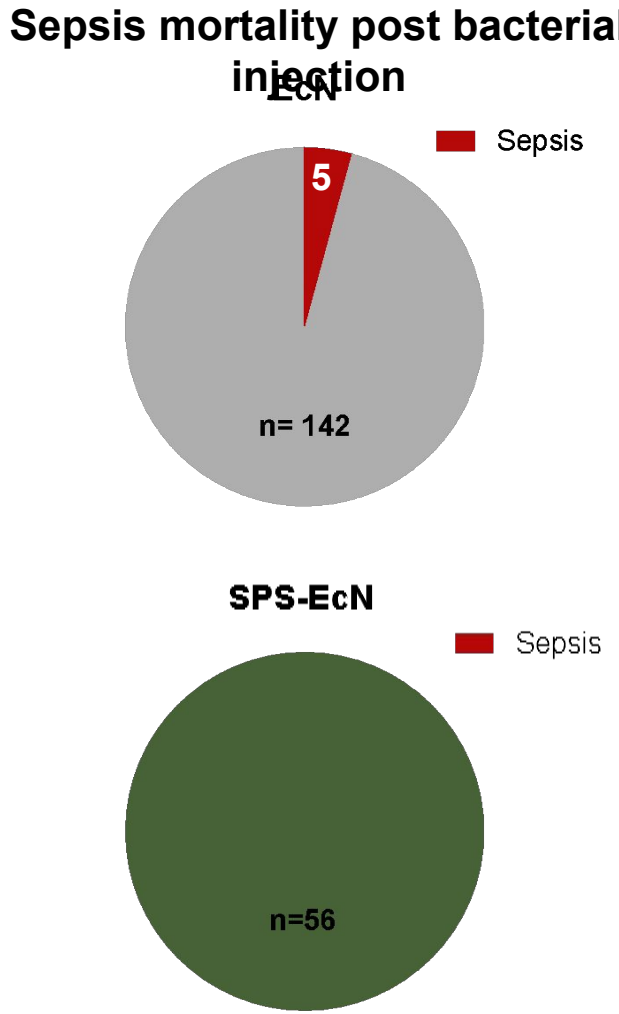
SPS-Bacteria displays increased tumor colonization properties





- SPS encapsulated bacteria displays higher and faster tumor colonization rates in immunocompetent mice

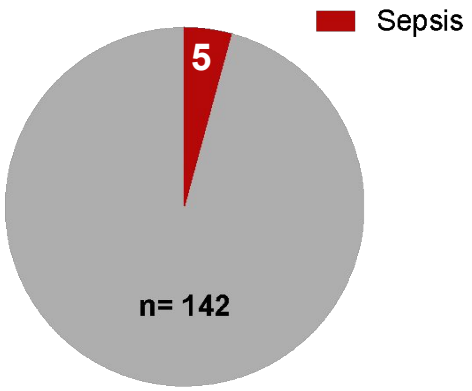
SPS-Bacteria displays decreases sepsis occurrence post injection



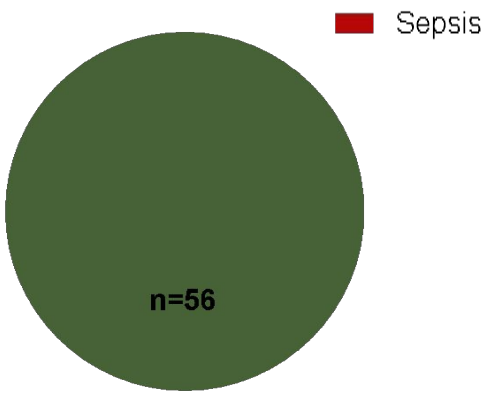
SPS-Bacteria displays decreases sepsis occurrence post injection

Sepsis mortality post bacterial injection

EcN



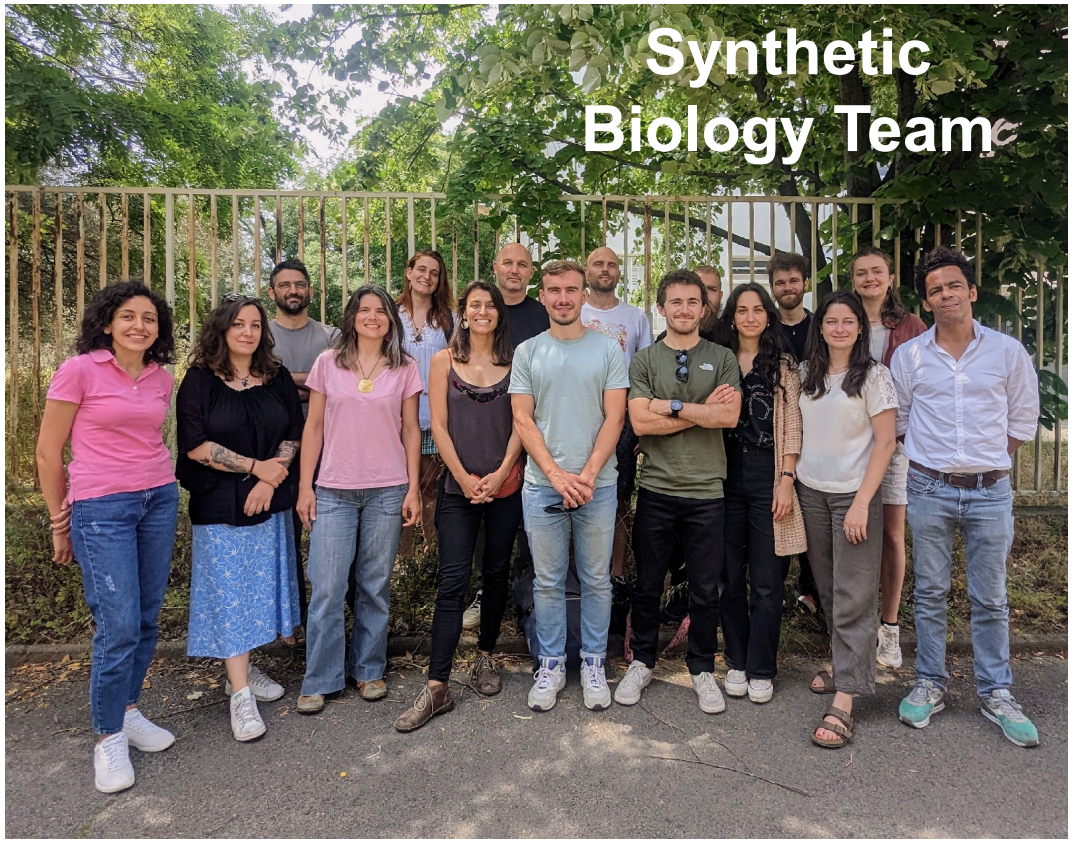
SPS-EcN



Take home messages

- 99% bacterial coating with SPS polymer
- pH-dependant release at the TME
- SPS decreases bacterial immunogenicity *in vitro*
- SPS decreases bacterial immunogenicity in immunocompetent mice
- SPS increases the tumor colonization ability of the bacteria

Acknowledgments



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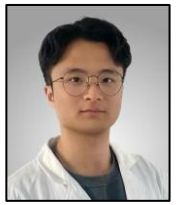

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