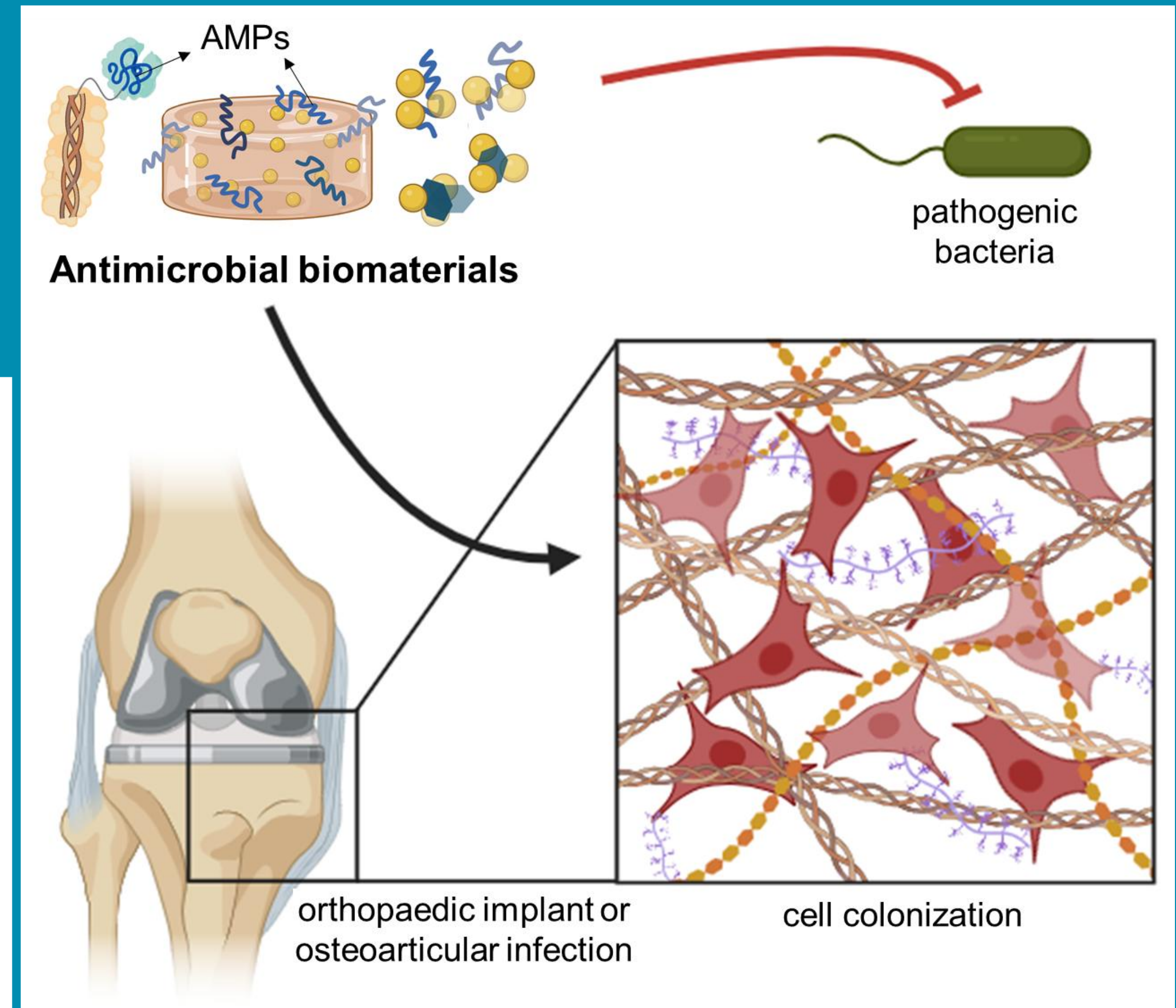


In Situ Mineralization of Alginate Hydrogels with Nisin: A Bioactive Material for Bone Applications

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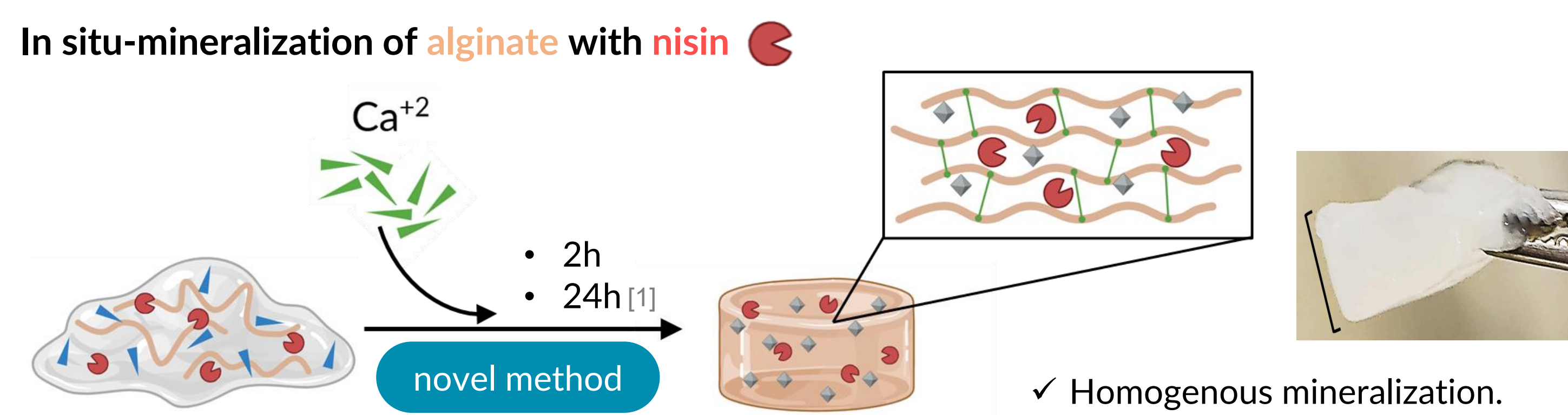
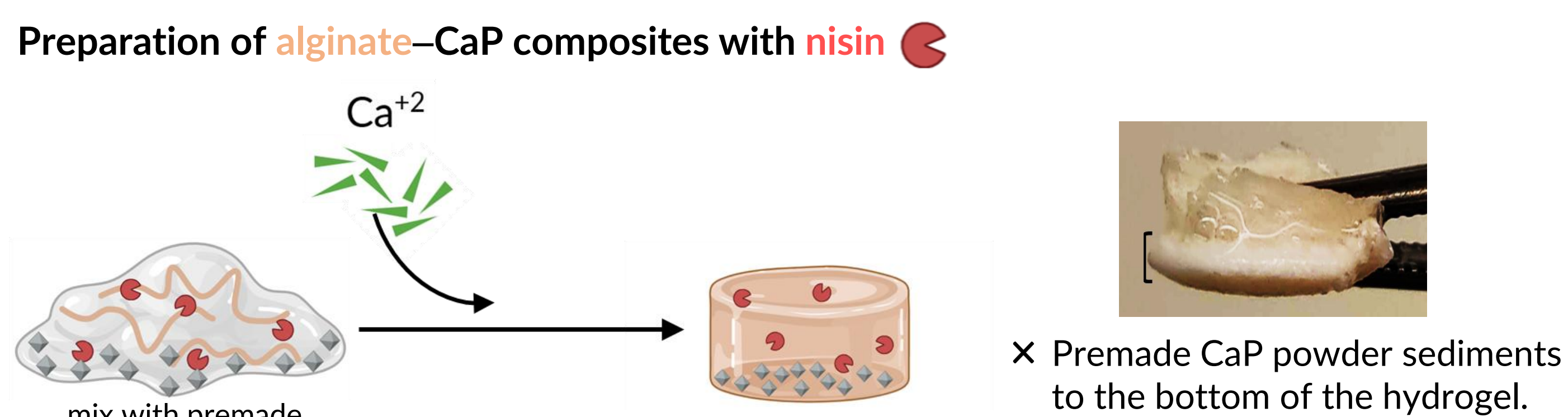
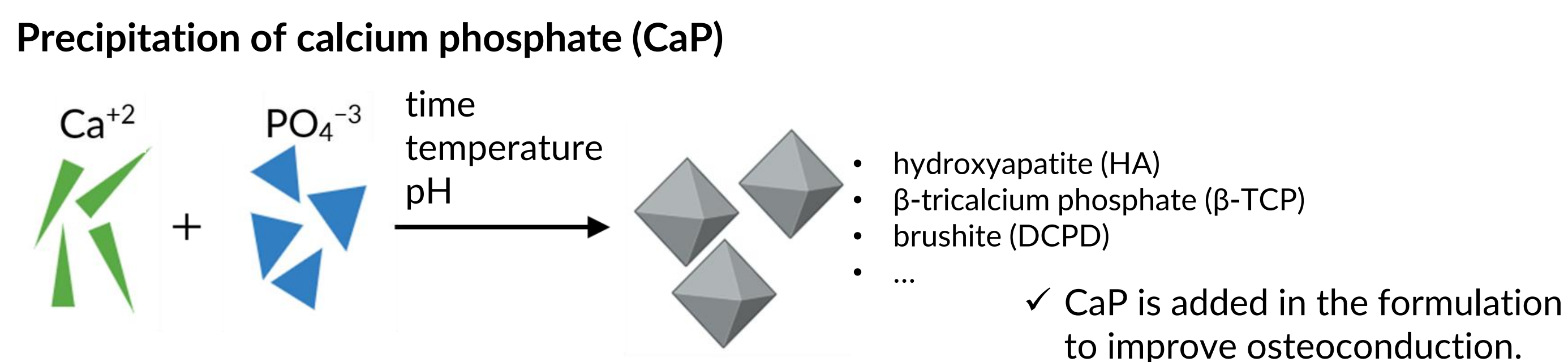
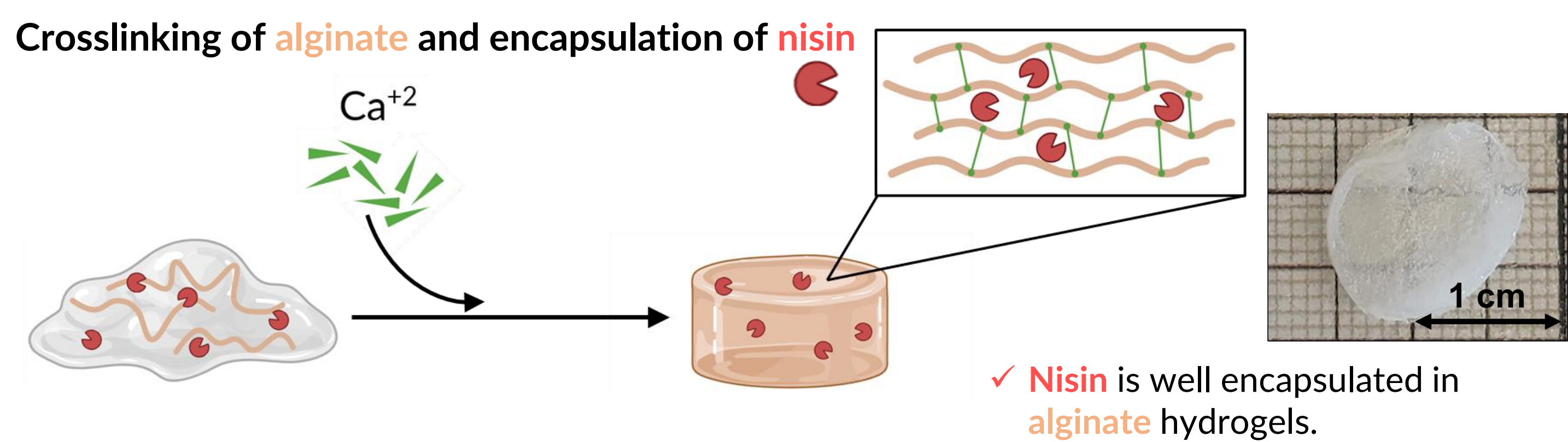
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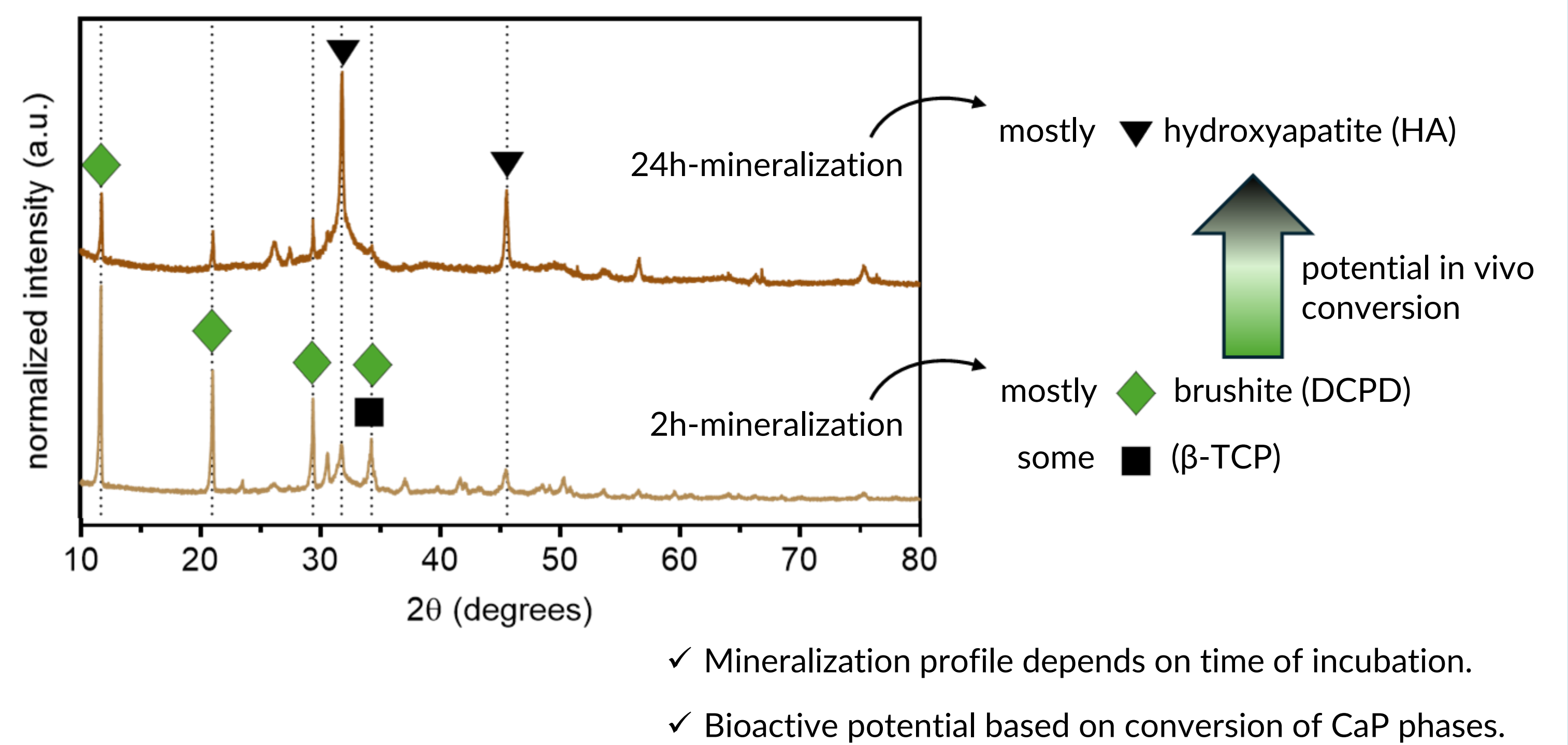
INTRODUCTION

- Osteoarticular and implant-associated infections are common and challenging to treat, especially due to antibiotic resistances and biofilm formation.
- Biomaterials with antimicrobial properties are critical to:
 - Prevent infections at the implantation site.
 - Deliver antimicrobial agents locally in case of infection.
- Antimicrobial peptides (AMPs), such as **nisin**, are promising alternatives to antibiotics due to their potent activity and low propensity for resistance.

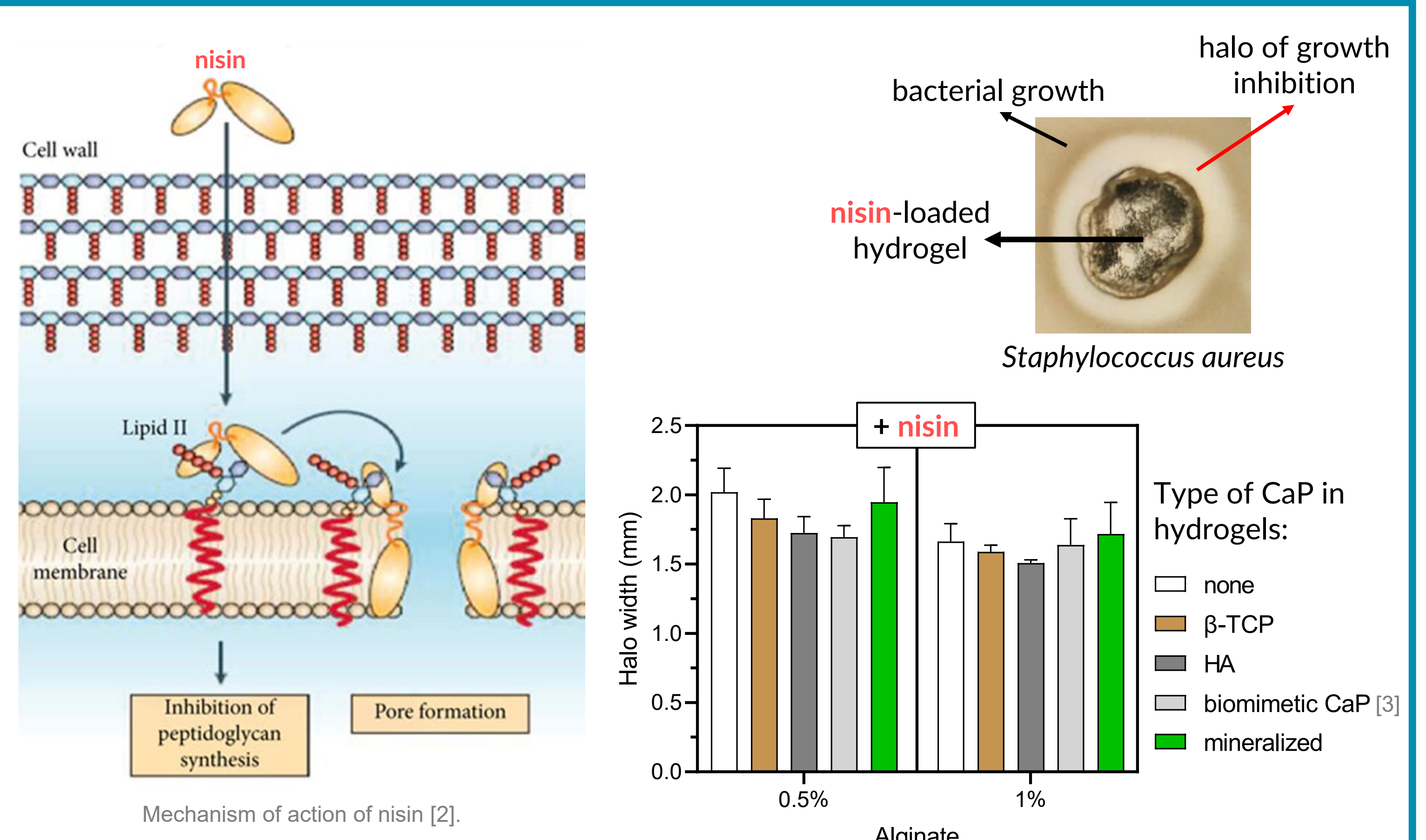
PRODUCTION of the biomaterial



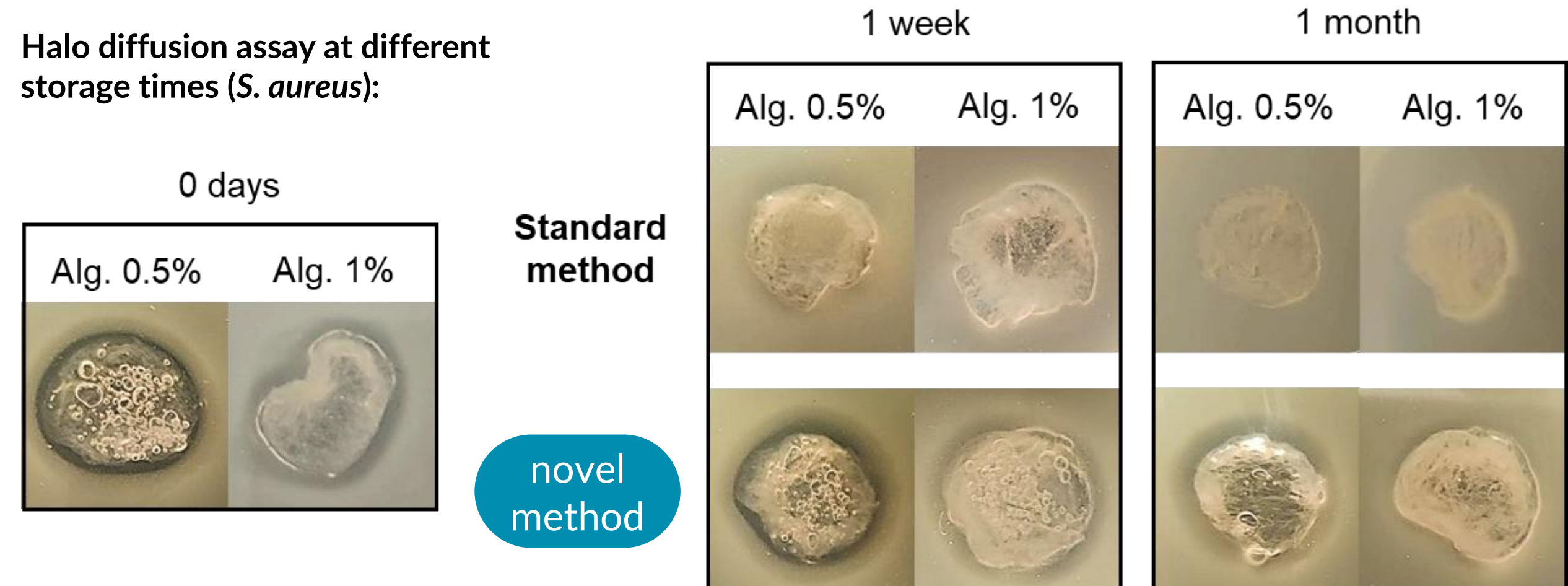
XRD of mineralized hydrogels



ANTIMICROBIAL EVALUATION by halo diffusion



STORAGE STABILITY



✓ The novel hydrogel preparation method markedly improves storage stability compared to standard approaches.

CONCLUSIONS

- Novel method developed for homogenous hydrogel mineralization and increased storage stability.
- Potent antimicrobial activity due to **nisin** release, independent of CaP presence.
- Mineralization profile hints bioactive potential.

PERSPECTIVES

- Mechanical and rheological analyses
- Quantification of **nisin** release over time
- Assessment of bioactive potential
- Antimicrobial effect against biofilms
- Cytotoxicity evaluation on human osteoblasts

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