

Master thesis project

The **Institute for Biologically inspired materials (BIMat)** seeks master students for a project to study the antibacterial activity of mussel inspired polydopamine coating.

Mussel inspired polydopamine (PDA) has aroused great interest as a new route for surface modification and functionalization, due to its simple one step deposition applied to almost any kind of material¹. The multiple functional groups presented on PDA allows to react with wide range of biomolecules providing a platform to produce diverse biomaterials with specific functionalities². PDA possess biocompatibility³ however the antibacterial activity of PDA is not well documented. Till date literature reports controversial results regarding the antibacterial activities of PDA coatings^{4,5}. The interaction between PDA coating and bacteria have not been well studied. And therefore, the mechanism of bactericidal properties is unclear and needs further investigation.

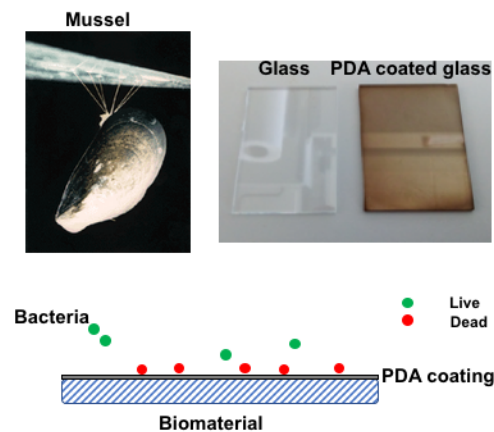


Fig. Antibacterial activity of mussel inspired polydopamine coating.

The aims of this project are to i) investigate the antibacterial activity of PDA coating, ii) study the interactions between PDA coating and bacteria, and iii) elucidate the mechanism of bactericidal properties.

References:

- 1) Lee, H., Dellatore, S. M., Miller, W. M. & Messersmith, P. B. *Science* 318, 426–430 (2007).
- 2) Kang, S. M. et al. *Angew. Chem. Int. Edit.* 49, 9401–9404 (2010).
- 3) Ku, S. H., Ryu, J., Hong, S. K., Lee, H. & Park, C. B. *Biomaterials* 31, 2535–2541 (2010)
- 4) Sileika, T. S., Kim, H. D., Maniak, P. & Messersmith, P. B. *ACS Appl. Mater. Inter.* 3, 4602–4610 (2011).
- 5) Ding, Y.H., Floren, M. & Tan, W. *Biosurface & Biotribology* 2, 121-136 (2016).

Project duration: 6 months

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