

## Pretreatment Methods Enhance Cancer Detection Biosensor Performance via Optimized Deposition of Multilayer Chitosan and Hyaluronic Acid Films

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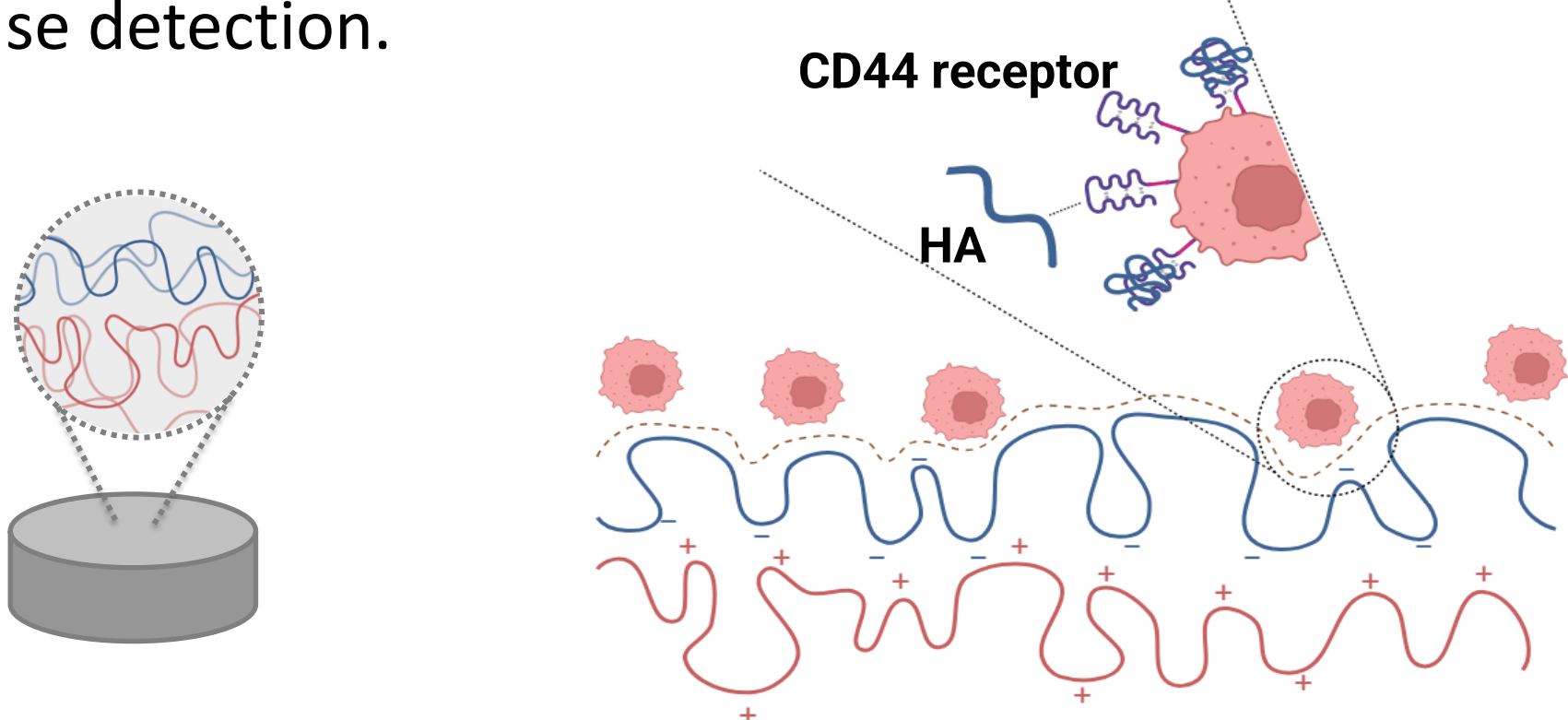
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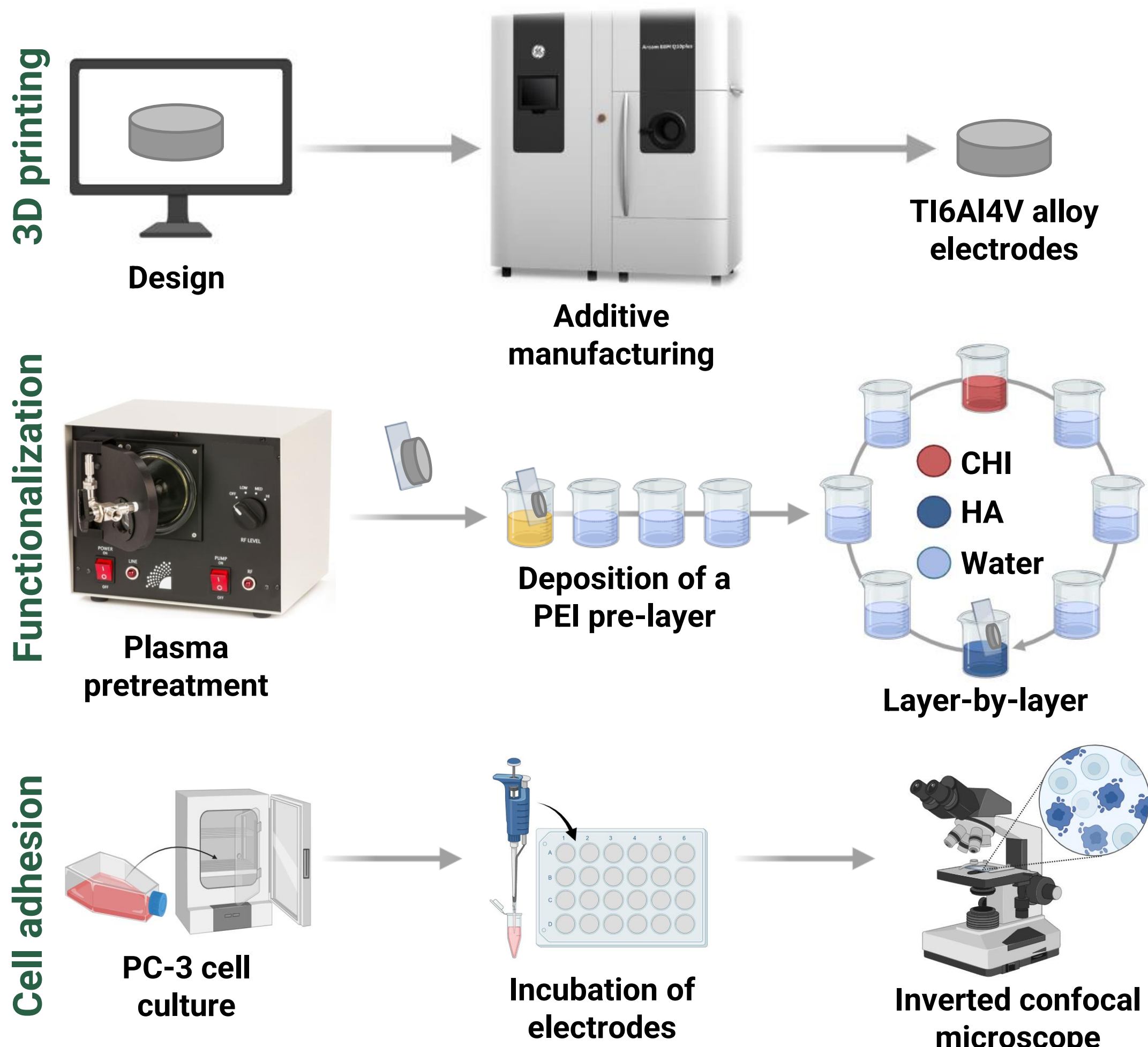
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### INTRODUCTION & AIM

- Multilayer films incorporating chitosan (CHI) and hyaluronic acid (HA) offer significant potential for cancer detection.
- The functionalization of electrodes produced by additive manufacturing is an innovation in biosensors, and the study for effective film deposition is crucial for the ideal performance of the biosensor.
- The investigation of plasma pretreatment and a PEI film precursor aims to enhance adhesion and surface properties, boosting biosensor selectivity and sensitivity for oncological disease detection.



### METHOD



### RESULTS & DISCUSSION

- Topography and roughness

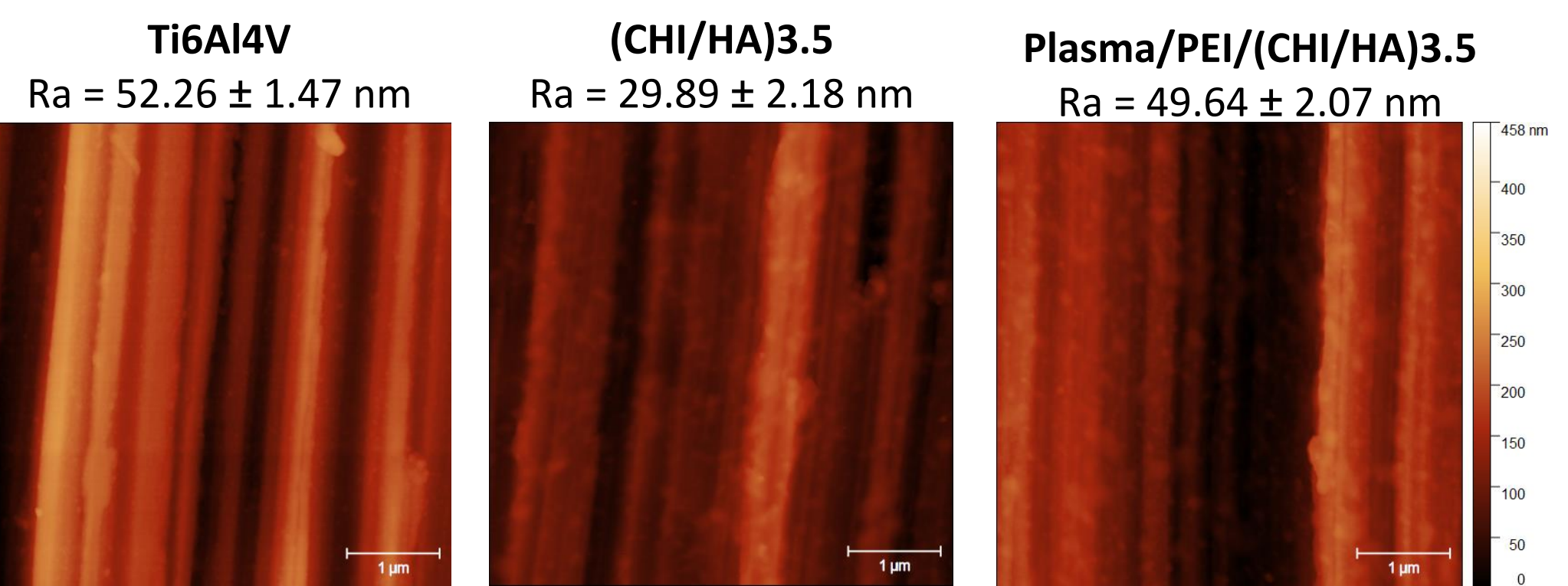


Figure 1. AFM topography images of dense coated electrodes obtained at 5 μm x 5 μm analyzed area and average roughness (Ra).

- Hydrophilicity

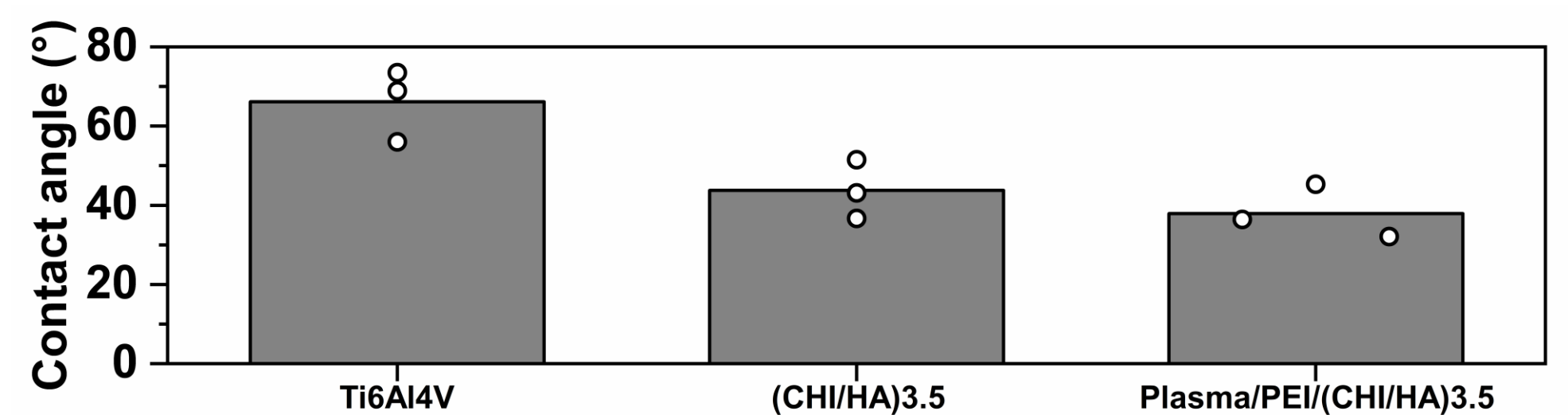


Figure 2. Contact angle of dense Ti6Al4V electrodes pre-treated and functionalized with CHI/HA coating.

- Cell adhesion

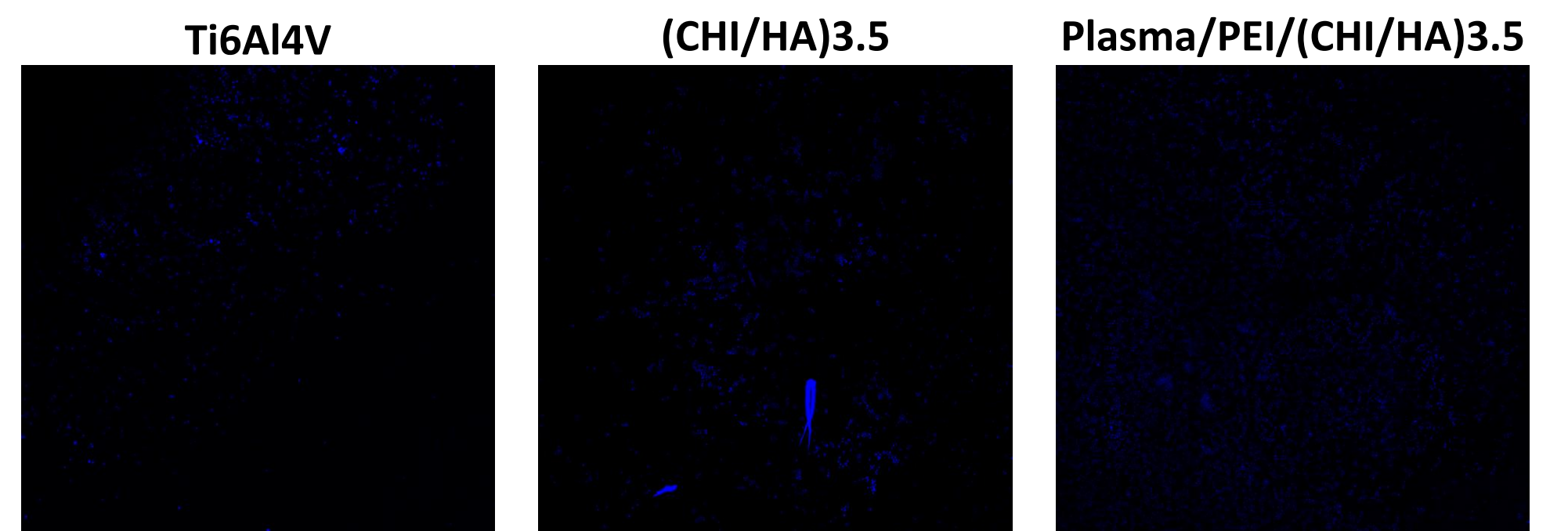


Figure 3. Microscopic images of DAPI-stained PC-3 cells adhered to dense Ti6Al4V electrodes pre-treated and functionalized with CHI/HA coating.

### CONCLUSION

Plasma pretreatment and PEI prelayer deposition provided:

- ↑ cell adhesion;
- ↑ coating roughness;
- Did not affect the wettability of the coating.

### REFERENCES/ACKNOWLEDGEMENTS

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[2] Neto, J.B.M. Rocha et al. Appl. Surf. Sci. 486, 508-518, 2019.  
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