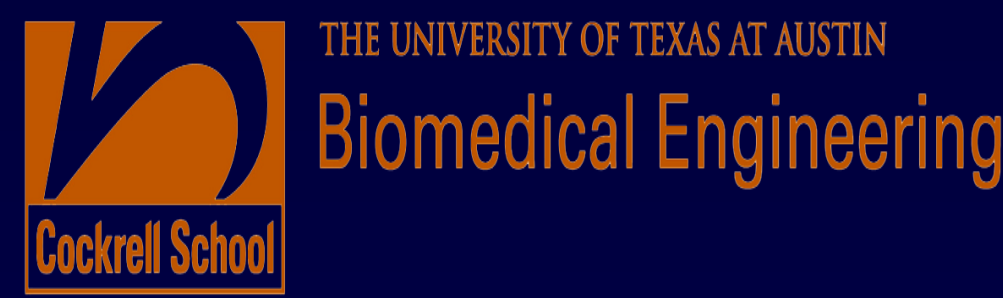


Development of Scaffolds for Regenerative Medicine by Molecular Imprinting

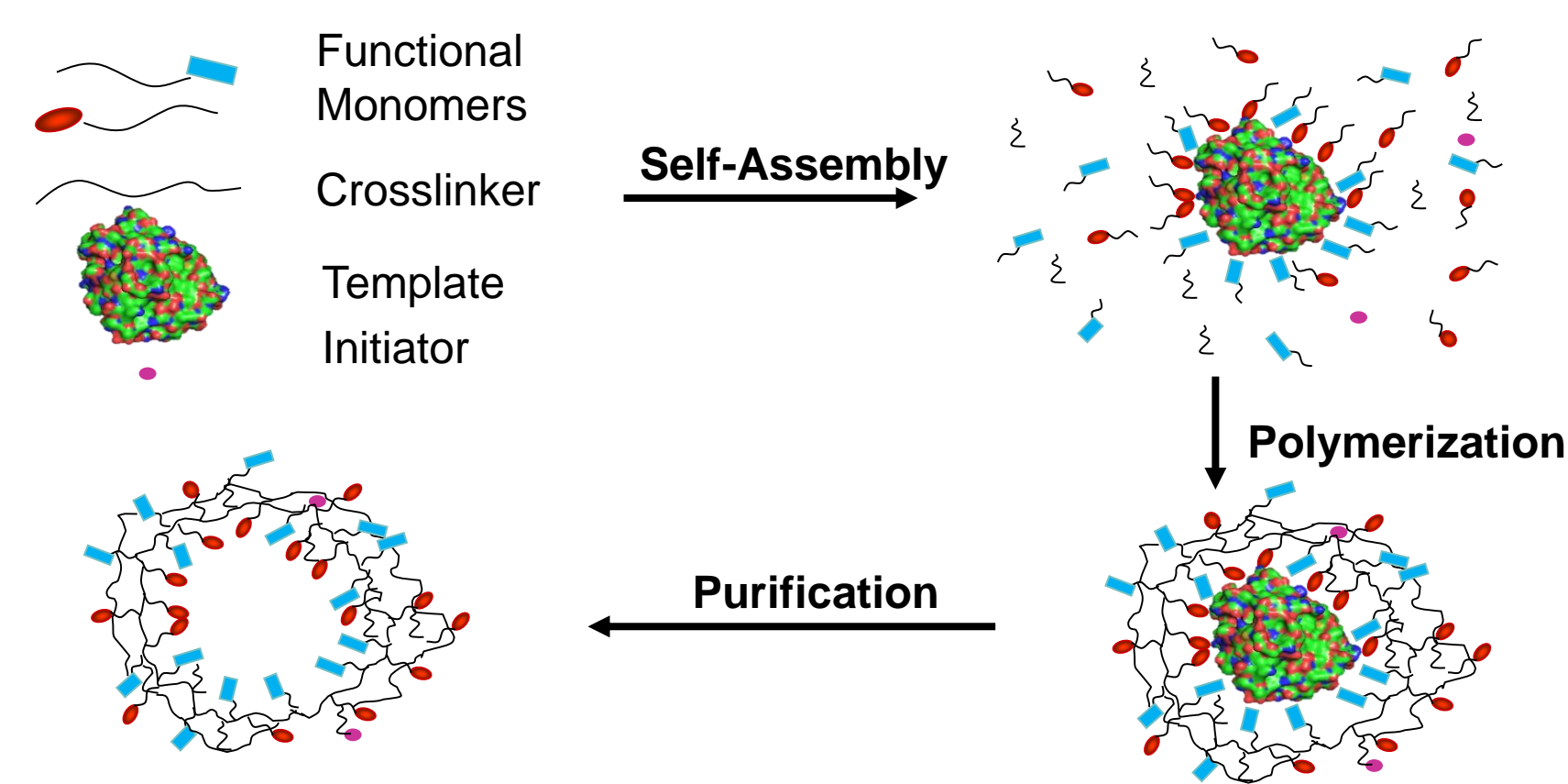
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SUMMARY OF UNIVERSITY OF TEXAS PROJECT WITH THE UNIVERSITIES OF MINHO AND PORTO ACCOMPLISHMENTS / OUTCOMES

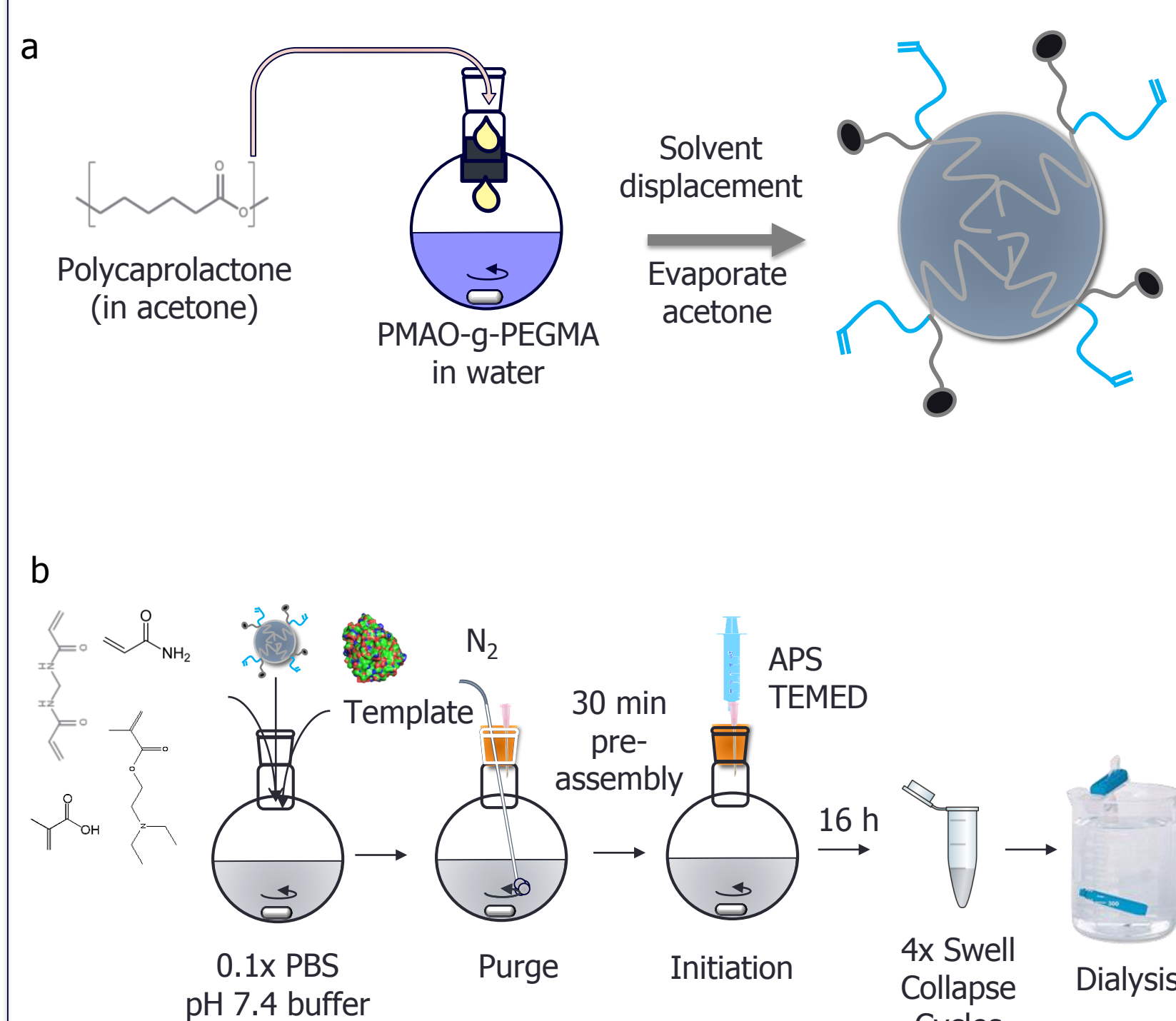
PREPARATION OF RECOGNITIVE SCAFFOLDS



SIX SPECIFIC AIMS:

- 1) Synthesis of novel imprinted synthetic polymer hydrogels
- 2) Synthesis of novel imprinted natural-based polymer hydrogels
- 3) Quantitative characterization and binding of imprinted polymers
- 4) Incorporation of a degradable crosslinker into the polymer backbone
- 5) Assessment of the in vitro behavior of imprinted polymeric systems
- 6) Cellular adhesion, proliferation and growth on imprinted polymer gel scaffolds

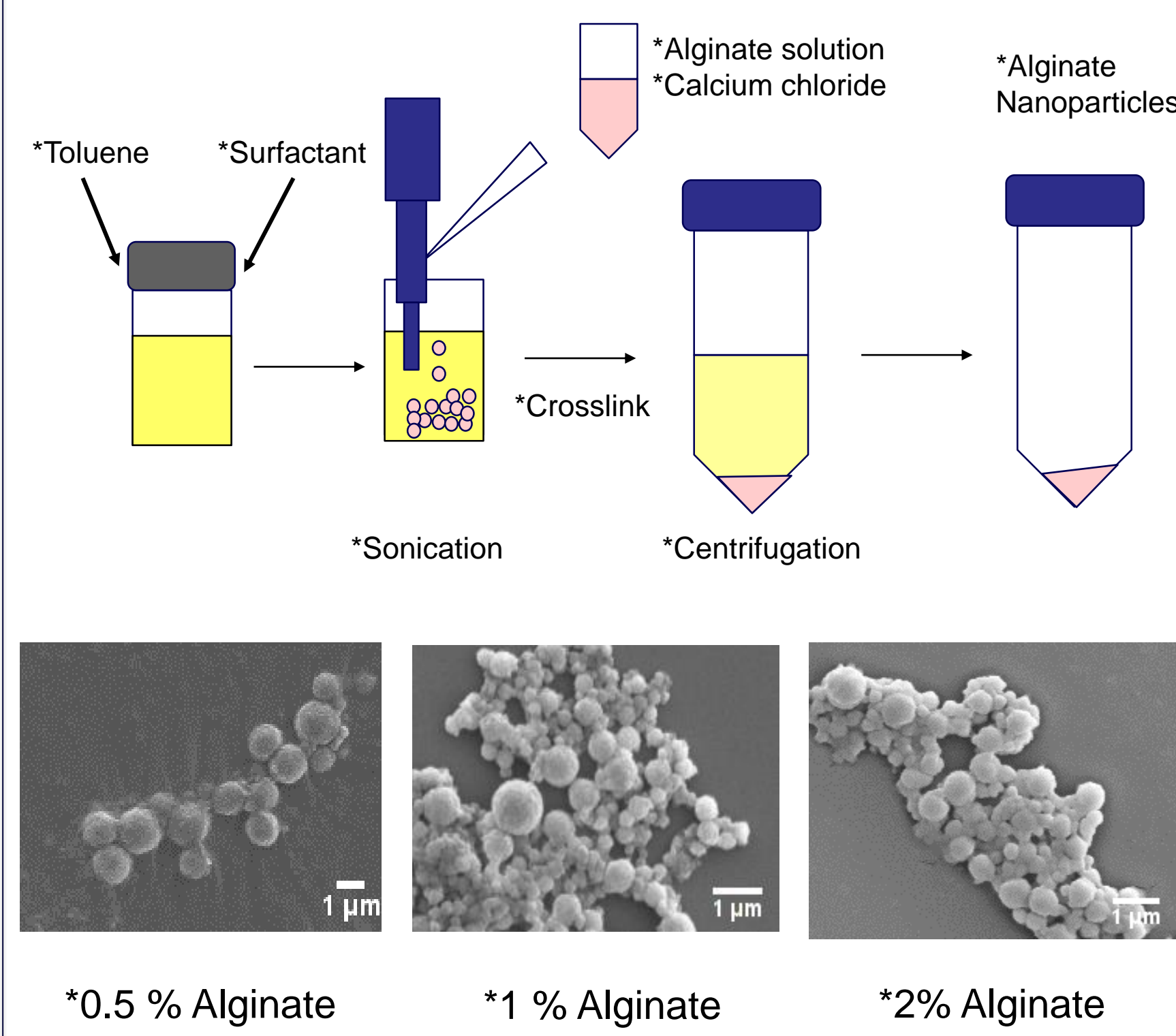
SYNTHESIS OF NOVEL IMPRINTED SYNTHETIC POLYMER HYDROGELS



Achievements Goal 1:

- Synthesized, purified, and characterized new hydrogel nanoparticles
- Developed new molecularly recognitive polymeric systems
- Imprinted protein templates in polymeric matrices

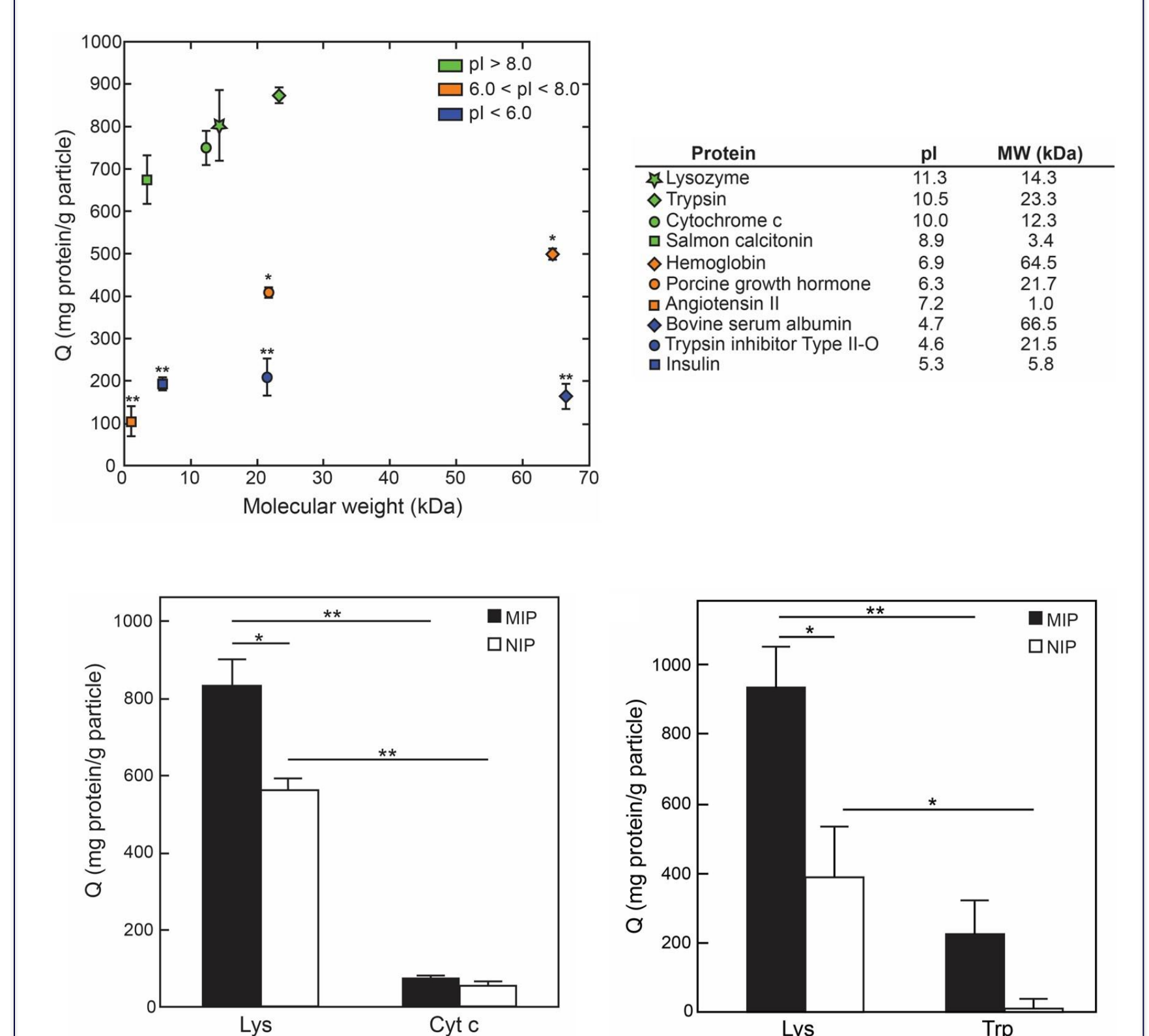
SYNTHESIS OF NOVEL IMPRINTED NATURAL-BASED POLYMER HYDROGELS



Achievements Goal 2:

- Synthesized alginate-based recognitive matrices with protein therapeutics
- Fabricated alginate-based nanoparticle systems

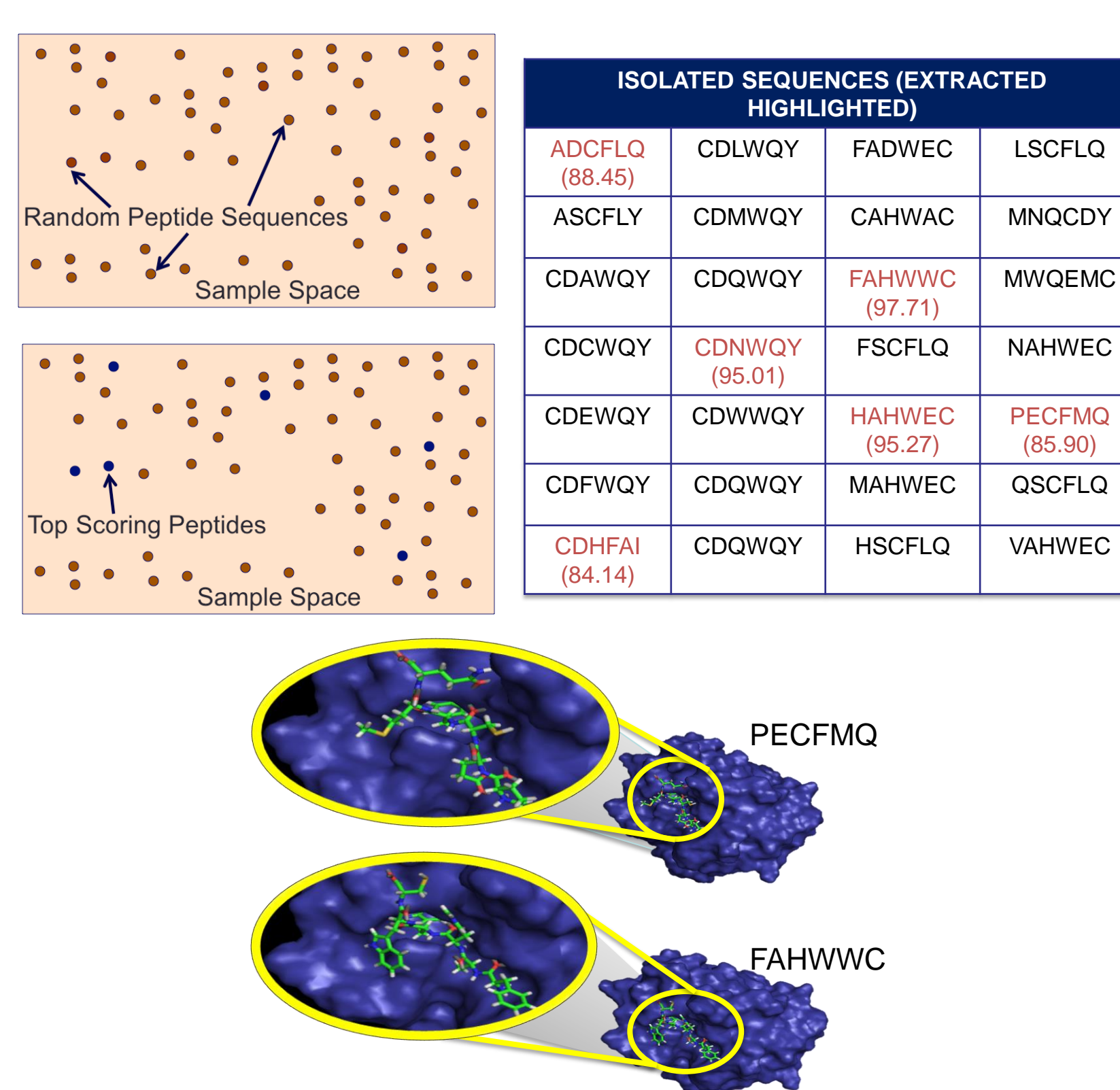
QUANTITATIVE CHARACTERIZATION AND BINDING OF IMPRINTED POLYMER SCAFFOLDS



Achievements Goal 3:

- Evaluated recognition and binding capacities of lysozyme imprinted scaffolds
- Characterized selectivity of imprinted particle systems in competitive environments
- Quantified binding capacities of lysozyme, and trypsin imprinted nanoparticles with similar proteins

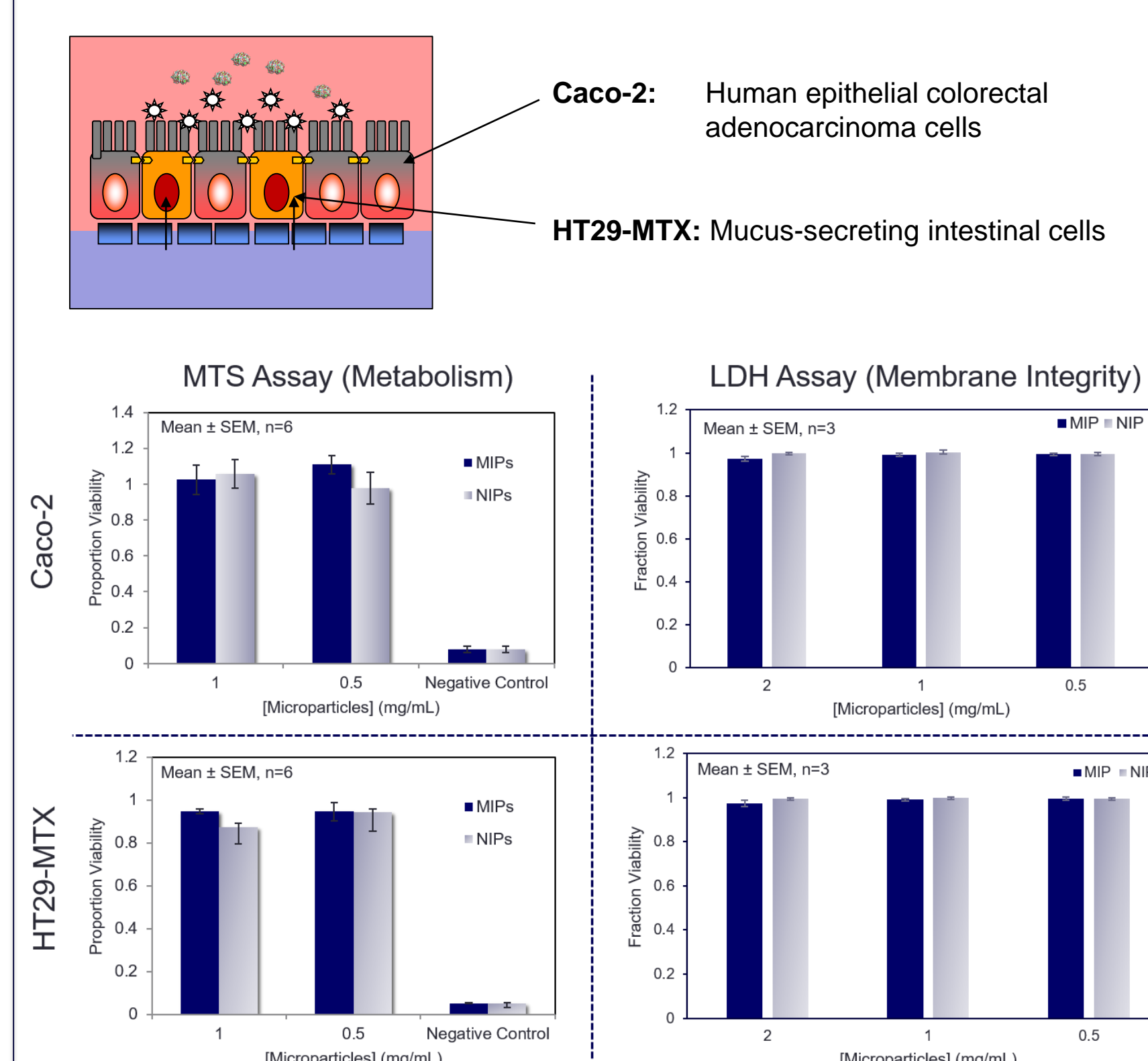
INCORPORATION OF PEPTIDES INTO THE POLYMER BACKBONE



Achievements Goal 4:

- Generated and selected peptide sequences that interact most strongly with trypsin protein using molecular simulations
- Incorporated oligopeptides into polymeric systems
- Evaluated the recognitive ability of peptide-targeted polymeric nanoparticles

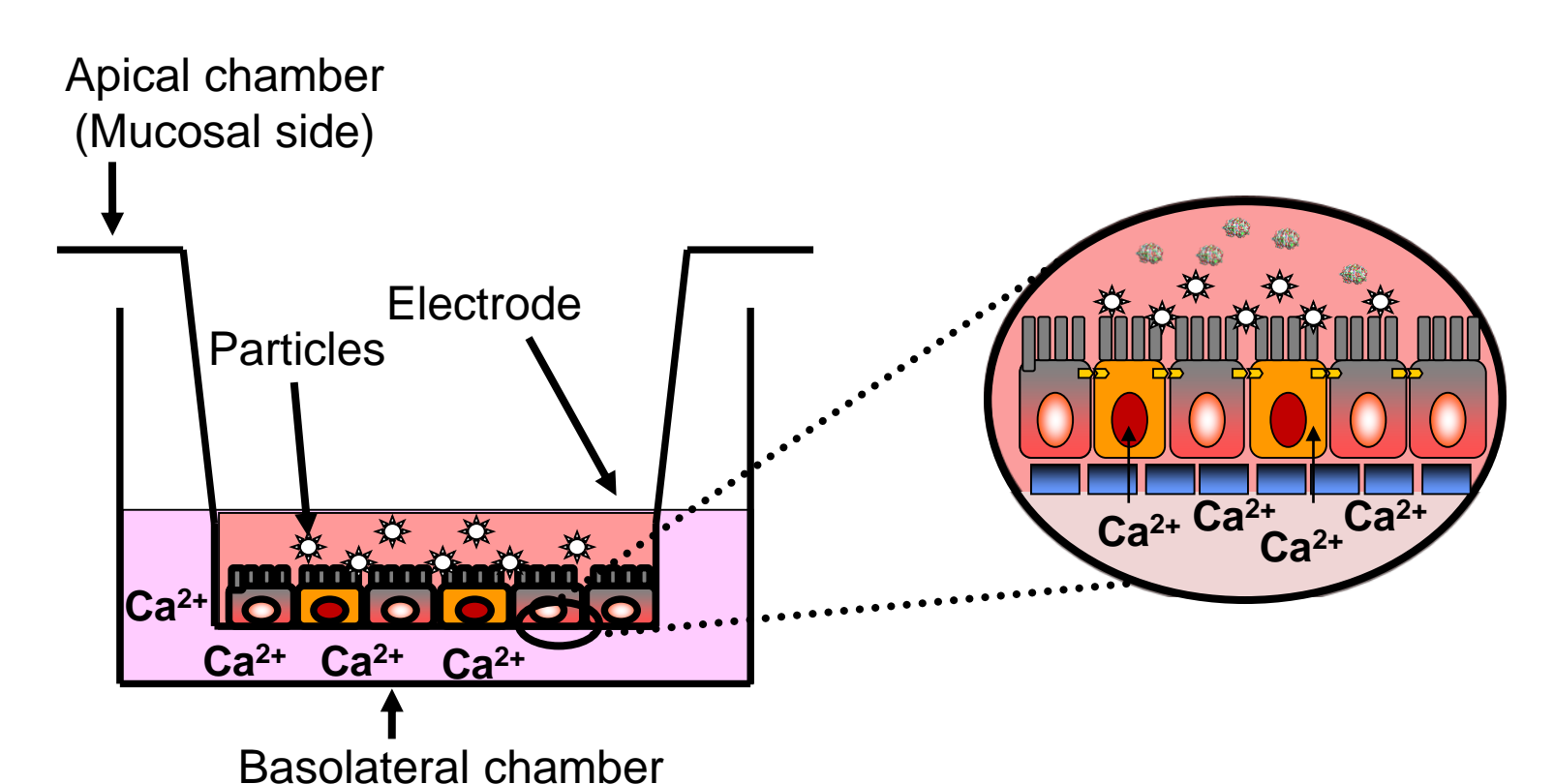
ASSESSMENT OF THE IN VITRO BEHAVIOR OF IMPRINTED POLYMERIC SYSTEMS



Achievements Goal 5:

- Established an intestinal cell-mimicking model using Caco-2 and HT29-MTX co-culture
- Evaluated the cytotoxicity of molecularly-imprinted polymeric particles

CELLULAR ADHESION, PROLIFERATION AND GROWTH ON IMPRINTED POLYMER GEL SCAFFOLDS



Goals for Aim 6:

- Evaluate the ability of molecular imprinted polymer systems to deliver protein therapeutics in an intestinal in vitro model

ACKNOWLEDGMENTS

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