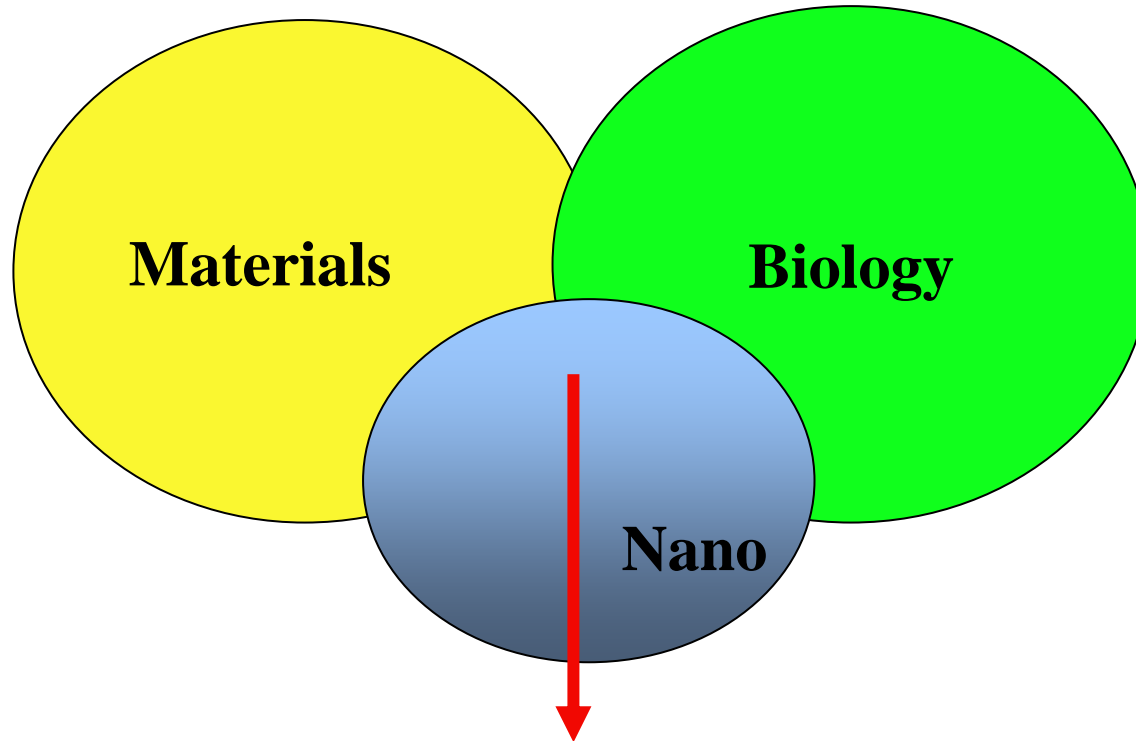


# 3.034

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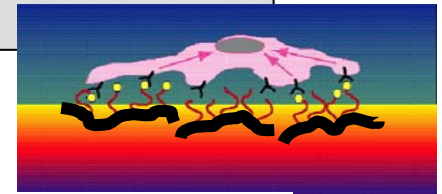
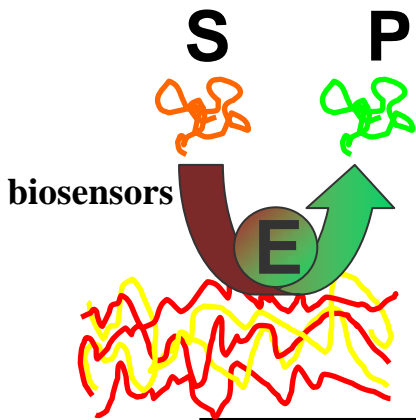
**Life at the interface**

# Motivation for 3.034

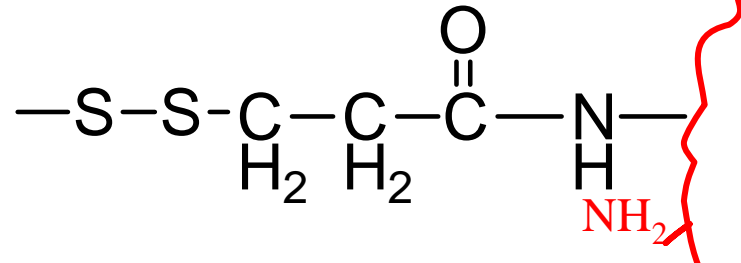
Use principles of Materials Science and Engineering to solve bio-related problems



Use Biochemistry and Biology to create new materials



GRGDSPC



surface modification



# Toolbox of Materials Science and Biochemistry

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## Reactions

- Nucleophilic substitution
- Coupling chemistry
- Protection chemistry

## Secondary interactions

- H-bonds
- hydrophobic interactions
- electrostatic interactions
- $\pi$ - $\pi$  conjugation

## Synthetic polymers

- polyesters
- polyamides
- polycarbonates
- polyurethane-ureas
- biodegradable polymers
- conducting polymers

## Biomolecules

- amino acids, peptides, proteins
- enzymes
- antibodies
- DNA
- lipids

## Nanomaterials

- Carbon nanotubes
- gold nanoparticles
- semiconductor nanoparticles