



## Thesis (B.Sc. / M.Sc.)

# Electrochemical biosensor development for protein detection

This project aims to explore label-free electrochemical biosensing strategies for detecting proteins by leveraging DNA molecules immobilized on a conductive surface. The overall objective is to investigate the interaction between target proteins and DNA-functionalized electrodes, observing how these interactions affect electrochemical signals. This label-free approach avoids the need for secondary tags or labels, potentially enabling simpler and more sensitive detection systems.

### General Steps

- Literature Review & Conceptual Design
- Electrode Preparation
- Protein Detection Experiments
- Electrochemical Measurement & Data Analysis
- Result Interpretation & Troubleshooting
- Reporting & Documentation

### Techniques & Learning Outcomes

- Electrochemical methods: CV, chronoamperometry
- Surface chemistry: DNA immobilization strategies, surface cleaning and modification
- Biofunctionalization protocols: Protein-DNA interactions, hybridization strategies
- Instrumentation handling: Potentiostat usage, electrode setup

### Prerequisites for the Student

- Basic understanding of chemistry and biology
- Familiarity with wet-lab and handling biological materials is advantageous
- Introductory knowledge of electrochemistry is helpful but not strictly required

For further information, please contact Irem Ergenlioglu.

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