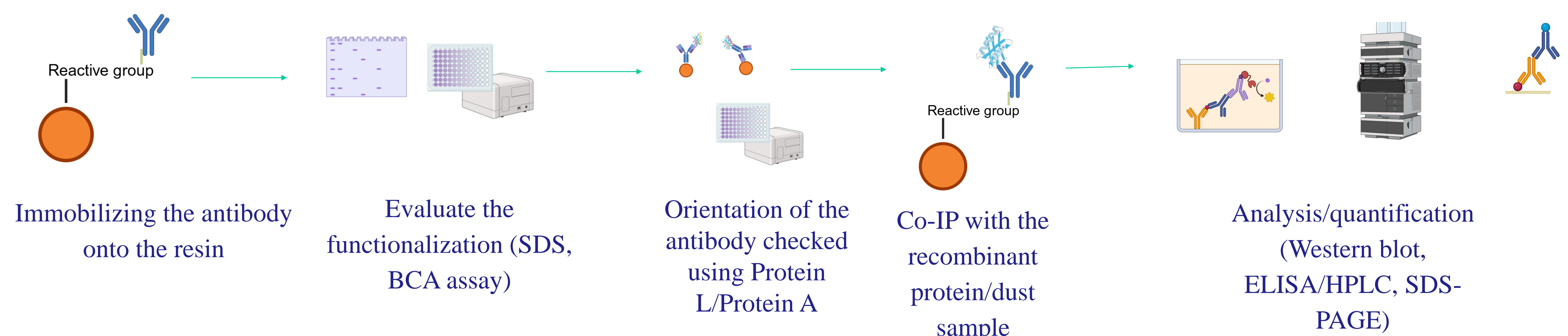# Master's thesis

Affinity-Based Separation of Lipocalin Protein from Natural Samples Using Antibody-Functionalized Resin

Keywords: Lipocalin protein | Antibody immobilization | co-immunoprecipitation (Co-IP)| Dust extract | Antibody orientation

Project Description

This project focuses on isolating one of the candidate proteins (Lipocalin proteins) with potential asthma-preventive activity, found in dust collected from cow farms. Previous studies have demonstrated that this dust extract can provide protection against asthma, and the goal is to better understand which components are responsible.

The affinity based strategy using antibody will support the identification of biomolecules in environmental dust that contribute to asthma prevention, with potential implications for therapeutic development.

Immobilizing the antibody onto the resin → Evaluate the functionalization (SDS, BCA assay) → Orientation of the antibody checked using Protein L/Protein A → Co-IP with the recombinant protein/dust sample → Analysis/quantification (Western blot, ELISA/HPLC, SDS-PAGE)

Research Objective

1. Isolate and identify candidate proteins in cow farm dust extract.
2. Assess the orientation of immobilized antibodies using Protein A and Protein L.
3. Analyze the antibody-depleted fraction.
4. Analytical Technique: SDS-PAGE, BCA assay, Western blot, HPLC, ELISA.

Profile

- Structured and independent work
- Motivation to work as a team/ willing to learn
- Master student in chemical engineering, biotechnology (IBT, MBT),Pharmaceutical biotechnology biochemistry, chemistry, microbiology, biology or similar
- **Start date**: as soon as possible or September
- Language: English
- Ideal, but not required: Lab experience