A Novel Immunochemical Detection System for Food Allergens

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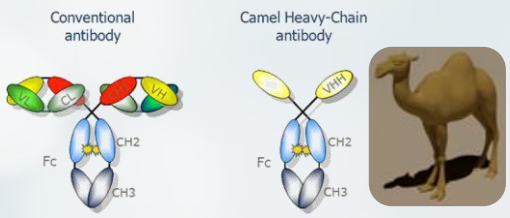
Introduction

Antibodies are a useful tool for recognition of antigens in food. Antibodies have, however, a very complex structure that is not suitable for expression in simple cells, such as E. Coli, as most antibodies are created in higher life forms, such as rabbits. The Camelid antibody IgG (cIgG), however, has lower complexity than the Human IgG. We present a new approach for recognition of food allergens with a synthetizised Camelid IgG (cIgG) for expression in E. Coli. The epitope of cIgG has been modified to attach to HEWL-antigen.

Conventional antibody vs Camelid antibody

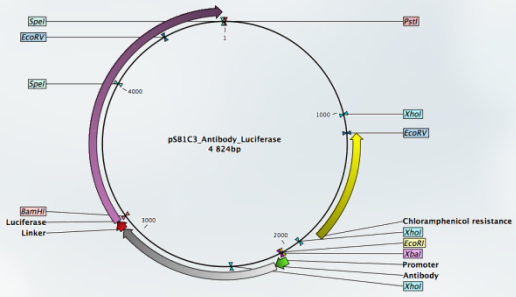


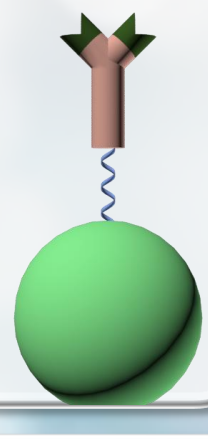
Camelid antibodies does only contain one of the light chains which makes it more suitable for production in E. Coli

HEWL the allergen

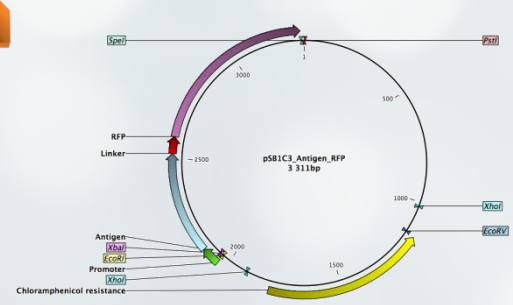
Hen egg white lysozyme is a common food allergen that can cause an allergic response. By using our detection method allergic shock can be prevented.

Antibody-Luciferas-Plasmid

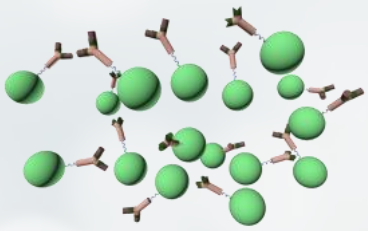




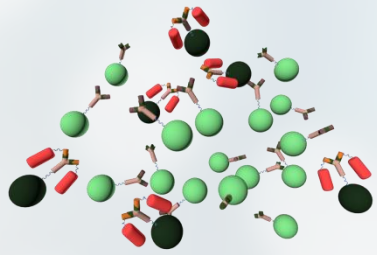
Antigen-RFP-Plasmid



Detection



If a food sample contains HEWL cIgG will bind to the HEWL-antigen resulting in a green luminescence.



If the food sample contains no HEWL then A-HRFP will bind to the cIgG causing a red-shift in luminescence. Depending on how much the luminscence shifts we can detect HEWL concentrations

LiU iGEMs biosensor

The luminescent output will be detected with a biosensor design by us. The detector will use software and calculations based on our simulated models.