Phage display application in immunological analysis of wheat-dependent pathological conditions.

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Introduction

The problems, associated with wheat (***Triticum aestivum***) - in the spotlight, because of their effect on people’s health and everyday life.

Main component of the human’s diet, because of its bread-making properties and nutritional value.

Immunogenic proteins in wheat:

storage proteins
enzymes
enzyme-inhibitors

glutenin + gliadin

proteases

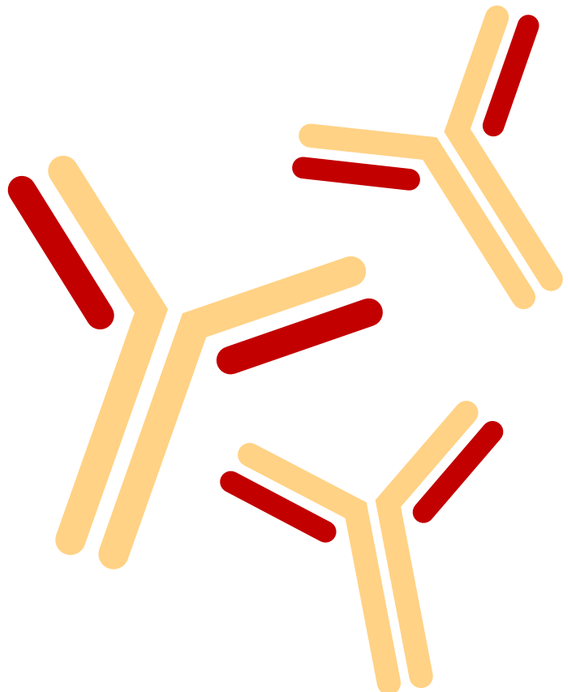
trypsin-inhibitors

CELIAC DISEASE

BAKER’S **WHEAT ALLERGY**

ASTHMA **WDEIA**

ATOPIC DERMATITIS



Introduction

Alternatives - potential substitutes for wheat.

einkorn *kamut* *spelt* *maize*

Bread making → Baking → Affects digestibility → **Affects immune response**

High temperature
Low humidity

Aim

Decipher the connection between the protein content, digestibility and cross-reactivity of the said cultures.

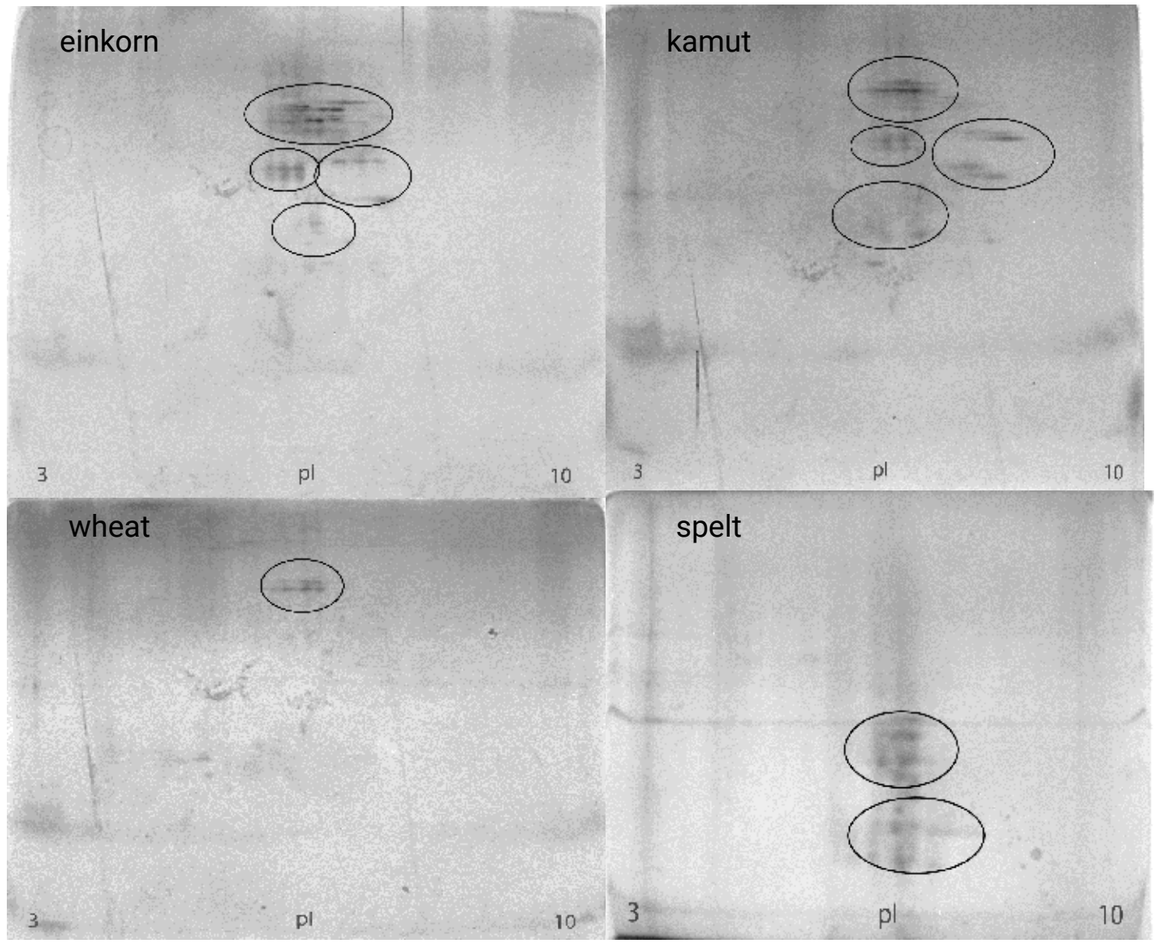
Methods

Phage display technology;
TCA-Acetone protein extraction;

In vitro hydrolysis with digestive enzymes;
Western blot technique.

Results & Discussion

Profiles of double digested proteins from bread



Western blot of proteins, extracted from bread hydrolysates;

1-einkorn, 2-kamut, 3-wheat, 4-spelt, 5-positive control

- Almost complete proteins' hydrolysis.
- Least protein denaturation observed with einkorn and kamut - potentially more immunogenic.

- None protein fractions detected - doesn't mean that the hydrolysis is full.
- The experiment is in ideal conditions - absence of various factors like physiological condition, baking temperature, mixture content.

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