Internship Report - Kansas State University (Manhattan, Kansas, USA)

Duration: 30 August-30September, 2025

Host Department: Department of Grain Science and Industry, Kansas State University

Supervisor: Dr. Yonghui Li, Associate Professor

During my one-month research internship at Kansas State University, I carried out a project under the supervision of Dr. Yonghui Li in the Department of Grain Science and Industry. The research focused on the **Fourier-transform infrared (FTIR) spectroscopic analysis** of protein isolates derived from seeds of selected Cucurbitaceae plants. The study aimed to assess the secondary structure and conformational changes of proteins resulting from technological processes.

In addition, I worked on **predicting the biological activity of peptide sequences** using the **UniDL4BioPep** program, which allowed for a preliminary evaluation of the bioactive potential of the analyzed peptides.

Throughout the internship, I attended a series of lectures and seminars within the graduate course **GRSC 850 - Grain Protein Chemistry & Technology**, instructed by Dr. Yonghui Li, as well as invited lectures delivered by distinguished researchers, including:

- **dr Viswas Ghorpade** (MGP): *"MGP Company and Product Overview"*,
- **dr Kathy Gross** (Hill's Pet Nutrition): *"Converging Consumer Drivers Across Species: The Microbiome as a Catalyst for Food and Health Innovation"*,
- dr **Liping Zhao** (Rutgers University): *"Guild-Level Response of the Gut Microbiome to Nutritional Signals: Advancing Precision Nutrition for Metabolic Health"*,
- dr **Shenmin Sang** (North Carolina A&T State University): *"Hidden Health Power: How Whole Grain Bioactives Support Personalized Nutrition"*.

Participation in the internship enhanced my expertise in protein chemistry and technology, modern analytical methods for protein structure evaluation, and current research trends in functional foods and nutrigenomics. It also allowed me to develop essential research, communication, and teamwork skills in an international academic environment.

Kansas State University is one of the leading research universities in the United States, combining academic tradition with innovation. As the nation's first operational land-grant university, K-State has been shaping generations of scientists and innovators for more than 160 years. The Department of Grain Science and Industry is globally unique, it brings together experts working across the entire grain research chain, from genetics to food processing technology and safety. Renowned for its strong research infrastructure, industry collaboration, and interdisciplinary approach, K-State provides an exceptional environment for scientific growth and the advancement of research in nutrition, biochemistry, and biotechnology.

The internship is carried out as part of the STER NAWA Project "Actions towards the internationalization of the Doctoral School of the University of Life Sciences in Lublin (I-SDUPL)".