LITHUANIAN UNIVERSITY OF HEALTH SCIENCES

International **Summer School** Practice

Formulation Development and Physical Stability Evaluation of a Salt-Based Scrub

This summer research project aims to develop and systematically assess a salt-based body scrub designed for rinse-off cosmetic use. Salt scrubs are multi-phase semi-solid systems composed of solid exfoliating particles within a structured continuous phase. The stability and effectiveness of these systems heavily rely on formulation design, structural organisation, and rheological characteristics. Thus, careful formulation and physicochemical testing are crucial to ensure consistent texture, structural integrity, and storage stability.

The study will involve creating prototype formulations with varying compositional and structural parameters (e.g., phase ratio, structuring method, viscosity modifiers, or oil type). The goal is to examine how these variations impact physical stability and instrumental texture attributes. The following parameters will be evaluated: pH measurement to confirm skin compatibility and monitor stability over time; Texture analysis, including firmness/consistency, cohesiveness, adhesiveness, and spreadability, to relate instrumental data to sensory expectations; Centrifugation tests as accelerated stability assessments to detect phase separation, salt sedimentation, or structural failure; Moisture content analysis to assess water's effect on product consistency and long-term stability; Foaming behavior will be assessed using a standardised shaking method. Accelerated stability tests will be performed under controlled storage conditions (such as room and elevated temperatures). We will monitor changes in viscosity, texture, pH, moisture, and visible separation to evaluate formulation robustness. The plan of the project would be like this:

1. Literature review and work planning
2. Preparation of salt scrub formulations
3. Evaluation of physical and structural properties
4. Accelerated stability testing
5. Data analysis and summary of results

The project's expected outcome is to identify a salt scrub formula with enhanced structural stability and consistent physicochemical properties. Overall, the results will deepen understanding of the relationships between formulation, structure, and stability in exfoliating cosmetic products.