stabilized with AA, effectively enhance bioactivity; however, further work is required to optimize the maximum amount that can be encapsulated as NPs delivery for the greatest effect. The findings show a potential novel approach in developing more efficacious strategies that use polyphenols as an adjuvant cancer therapy for breast cancer.

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P36-20-26 Recipe Standardization and Creative Culinary Optimization of Geographically Indicated Foods: A Case Study from Eskişehir, Türkiye

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Objectives: This study aims to ensure measurability, repeatability, and quality consistency in production processes by standardizing the recipes of 30 geographically indicated food products specific to Eskişehir; it also aims to evaluate the nutritional composition of 10 representative products using scientific analysis methods.

Methods: The nutritional values of the selected products have been analyzed using food composition databases.

Results: Within the scope of the study, technically feasible and reproducible standard recipes were developed for a total of 30 products. Running the production processes three times ensured high consistency in portion yield. As a result of nutritional analyses, the average energy value per portion of the standardized meals was calculated as 585 kcal. When the average macronutrient distribution was examined, the protein content was determined to be 17.7 g, the fat content 27.9 g, and the carbohydrate content 67.8 g. The average dietary fiber content was determined to be 4.0 g. Product-based evaluations showed that animal-based meals were richer in protein, while plant-based meals contained higher dietary fiber. Energy density was found to be particularly high in pastries and syrupy desserts, while vegetable and legume-based meals were found to have a more balanced macronutrient distribution. The findings reveal that nutrient profiles vary depending on the raw materials used and cooking techniques.

Conclusions: The combined use of recipe standardization and nutritional composition analysis demonstrates that geographically indicated products can be evaluated not only as elements of cultural heritage but also as scientific outputs providing measurable and comparable nutritional data. Standardized recipes contribute to the sustainability of gastronomic heritage, while nutritional data provides a scientific foundation for menu planning, portion control, healthy eating recommendations, and gastronomy education.

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P36-21-26 Mushroom β-Glucan-Resveratrol Nanocarriers Target Microglial Mitochondria to Attenuate Neuroinflammation via Immunometabolic Reprogramming

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Objectives: Resveratrol exerts anti-inflammatory effects and supports mitochodrial function, offering promise for mitigating neuroinflammation. However, its poor bioavailability and limited target-site accumulation constrain efficacy. This study engineered a dual-targeted nanodelivery system (CSR) in which mushroom-derived β-glucan provides TLR-mediated uptake by inflammatory microglia and the mitochondria-targeting peptide SS31 confers subcellular precision.

Methods: The characterization of CSR, including size distribution, loading capability, FTIR and 1H NMR spectra, was analyzed. The cellular uptake in resting and pro-inflammatory BV2 microglia, as well as the mitochondria-targeted co-localization were evaluated. Specifically, the effects effects on BV2 microglial immunometabolism using Seahorse extracellular flux analysis, mitochondria biogenesis, mitochondrial membrane potential and mtROS, were evaluated. The anti-inflammatory efficiency of CSR and underlying mechanisms were also explored. Finally, neuroprotective outcome was also assessed in a HT22-BV2 co-culture model.

Results: CSR formed spherical nanoparticles (147.5±14.5 nm) with high resveratrol loading (18.05±4.30%). In LPS-activated BV2 microglia, CSR markedly increased mitochondrial accumulation of resveratrol versus free resveratrol and β-glucan-resveratrol conjugates without SS31. Meanwhile, CSR promoted mitochondrial biogenesis, stabilized mitochondrial membrane potential, and reduced mtROS accumulation ($P < 0.05$). Seahorse assays indicated that CSR reprogrammed inflammatory BV2 microglia immunometabolism with enhanced OXPHOS and reduced glycolysis ($P < 0.05$). The nanocarries downregulated pro-inflammatory cytokines (TNF-α, IL6) and suppressed TLR4/NF-kB and HIF-1α signaling. In BV2-HT22 co-cultures, CSR mitigated HT22 neuronal apoptosis and intracellular ROS ($P < 0.05$).

Conclusions: This study explores β-glucan as a structurally engineerable nanoplatform that enables microglia-targeted and mitochondria-addressed delivery of dietary polyphenol. This dual-targeted strategy enhances the bio-efficacy of polyphenol against neuroinflammation via immunometabolism modulation.

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P36-22-26 Consumption of Pasture-Raised Animal-Source Foods Substantially Improves Red Blood Cell Omega-3 Fatty Acids in Adults: A Randomized Controlled Trial

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