



ID der Kurzfassung : 407

Cellular Agriculture and Genome Editing for Sustainable Production of High-Protein Soybean Biomass

Inhalt

Global population growth, environmental degradation, and rising demand for high-quality proteins are increasing pressure on food production systems. Cellular agriculture has emerged as a promising approach to produce nutritious biomass under controlled conditions while reducing dependence on conventional agriculture. Soybean (*Glycine max* L.), one of the world's leading protein crops, offers a valuable platform for sustainable protein production. This research aims to develop a soybean cellular agriculture platform integrated with genome editing technologies to enhance the yield and nutritional quality of protein-rich biomass for human and animal nutrition. The project combines plant tissue culture, cell suspension cultures, molecular biotechnology, and CRISPR-based genome engineering. Soybean cell cultures are being optimized to maximize biomass and protein accumulation. Targeted modulation of storage proteins, particularly glycinin (11S) and β -conglycinin (7S), is proposed to improve protein quality and increase sulfur-containing essential amino acids. The integration of cellular agriculture and precision genome editing is expected to generate a scalable platform for sustainable production of high-value nutritional biomass, contributing to food security, resilient food systems, and reduced environmental impacts associated with conventional protein production.

Keywords

Cellular Agriculture; Food Security; Soybean Biotechnology; CRISPR; Genome Editing; Sustainable Food Systems

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PhD Student

Junior Scientist Status

Yes, I am a Junior Scientist.

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