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Creating Patient-Specific iPSCs lines for Celiac Disease Research

Patient-derived induced pluripotent stem cells (iPSCs) offer a unique possibility to study cellular functions in a disease-specific and personalized manner. To our knowledge, such resources are not available for celiac disease. Our aim was to generate a comprehensive set of celiac patient and non-celiac control iPSC lines to develop physiologically relevant iPSC-based preclinical models.

We have reprogrammed iPSC lines from 10 non-celiac and 10 celiac patients using peripheral blood mononuclear cells. Nine clones were selected from each patient, and out of those, two clones were further characterized. The methods included karyotype analysis, indirect immunofluorescence staining, quantitative RT-PCR, HLA typing, and plasmid clearance analyses.

Immunofluorescence staining indicated that both celiac patient and non-celiac control iPSCs expressed key pluripotency markers, including NANOG, OCT3/4, Sox-2, SSEA4, TRA1-60, and TRA1-81. Similarly, gene expression analyses indicated the expression of pluripotency markers NANOG, SOX-2, OCT3/4, and C-MYC, with no statistical differences between celiac and non-celiac iPSC lines. Plasmid clearance analyses confirmed that the cell lines were cleared from episomal plasmids.

This data suggests that all celiac and non-celiac control iPSC lines express key pluripotency markers. These established human iPSCs are a valuable resource for studies of celiac disease modelling.