

Production and Evaluation of Human Platelet Lysate (hPL): A Xeno-Free Cell Culture Supplement

Lekha Arrolla

ULQA Scientific, Hyderabad, Telangana, India

Anindita Dasgupta

ULQA Scientific, Hyderabad, Telangana, India

Rukmini Jonnalagadda

ULQA Scientific, Hyderabad, Telangana, India

Abstract

Human platelet lysate (hPL) is emerging as an effective xeno-free alternative to fetal bovine serum (FBS) in human cell culture. Our study evaluates its effectiveness as a cell culture supplement compared to FBS. Three batches of hPL were prepared from expired platelet units upon obtaining ethical approval from the Institutional Ethics Committee of Kamala Hospital and Research Centre for Thalassemia and Sickle Cell Patients (Registration no. ECKHRSTS21-06/2024). Each batch was subjected to repeated freeze-thaw cycles, clarified by centrifugation, and filtered. The biochemical profile of hPL was assessed by measuring total protein concentration (Bradford assay), fibrinogen content (Clauss method), turbidity (OD₆₀₀), and growth factor concentration (ELISA). Cell culture performance was evaluated by comparing the viability and fold expansion of Jurkat E6.1 cells cultured in media supplemented with 1.25% hPL and 5% FBS. This study demonstrates that out-dated platelets can be repurposed into a cell culture supplement with a biochemical profile and cell culture performance superior to FBS.

Keywords

Human platelet lysate, xeno-free, expired platelet units, growth factor rich supplement.