

Coating Optimization for Enhanced A549 Cell Attachment and Impedance

Consistency Using the CIMS-32 System

Purpose

The purpose of this experiment is to evaluate the suitability of different coating materials for supporting A549 cell attachment and proliferation in impedance-based assays.

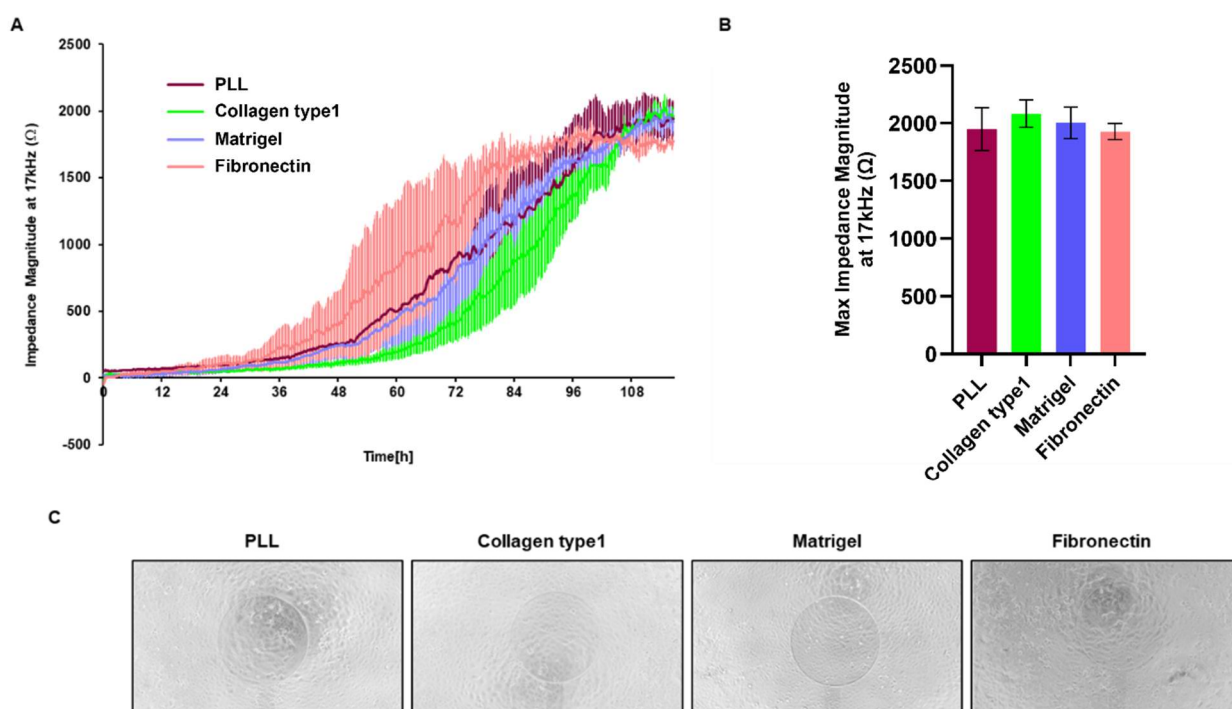
Experiment Overview

Cell Name	A549 cell line	Seeding quantity	10,000 cells/well
System	CIMS-32	Cell chip	CFPS-ITO-16W2E
Coating	1) Poly-L-Lysine (PLL), 2) Collagen Type I, 3) Matrigel, 4) Fibronectin	Treatment	

Workflow

DIV0	DIV1-DIV3
<ul style="list-style-type: none"> - Coat the CFPS plate - After seeding the cells, incubate for 1 hour and then add the media 	<ul style="list-style-type: none"> - Impedance recording

Results



Optimizing Coating for Enhanced Impedance Measurement of A549 Cell Proliferation

Impedance measurements demonstrated high sensitivity to the attachment of adherent A549 cells, enabling real-time tracking of their proliferation through impedance changes. Over time, impedance measurements revealed no statistically significant differences in cell attachment and proliferation across groups coated with Collagen Type I ($2083 \pm 119 \Omega$), Matrigel ($2003 \pm 136 \Omega$), Poly-L-Lysine (PLL) ($1951 \pm 185 \Omega$), or Fibronectin ($1928 \pm 70 \Omega$), indicating comparable performance among these coatings. Among the tested coatings, Collagen Type I exhibited the highest impedance value, while Fibronectin demonstrated the lowest. The relative difference in mean impedance between these two coatings was calculated as 7.42%. Since this difference falls within the experimental threshold of 10%, it is considered acceptable variability, indicating no statistically significant difference between Collagen Type I and Fibronectin in their ability to support A549 cell attachment and proliferation. Microscopic imaging further validated these findings, demonstrating consistent attachment and proliferation of A549 cells across the four tested coating conditions.

Summary

- ✓ Collagen Type I, Matrigel, PLL, and Fibronectin coatings provided comparable support for A549 cell attachment and proliferation, with relative impedance differences ranging from 1.18% (Fibronectin vs. PLL) to 7.42% (Collagen Type I vs. Fibronectin), all within the acceptable experimental variability of 10%.

