Ubigel Inperio

In vitro characterisation of the effect of UBIGEL on human gingival fibroblasts

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July 15, 2021

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Purpose: to verify whether the properties of Ubigel are mediated by a mechanical effect

Hypotesis: Ubigel is able to stimulate the gene expression of proteins used as mechanosensors (FAK, PAX and VNC)

Methods: cultivation of human gingival fibroblasts + Ubigel. Analysis of gene expression

CT: Control Group
UBI: Cultured cells with UBIGEL 0.2%
UBI+CyB: Cultured cells with UBIGEL 0.2% + cytochalasin B (CyB)

Gagliano N. *In vitro* characterisation of the effect of UBIGEL on human gingival fibroblasts. 2021

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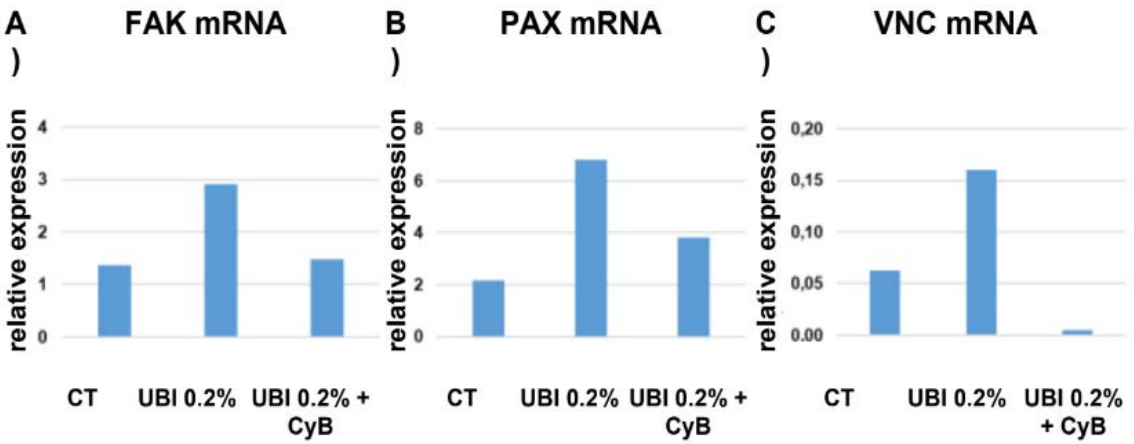

Figure 4. Representative histograms of mRNA levels for FAK (A), PAX (B) and VNC (C) after normalisation **on GAPDH expression. Data are expressed as the average of evaluations repeated twice for each gene.** Each sample was tested in triplicate.

Results

Ubigel induced an **increase** (up-regulation) in the mRNA levels of FAK, PAX and VNC by 115%, 217% and 167%, respectively vs CT;

Down-regulation o FAK, PAX and VNC in UBI+CyB group.

Conclusions

No changes in cell morphology;

Activation of cellular pathways mediated by mechanical mechanisms;

Mechanical stimulation of the gingival fibroblasts activity (*soluble scaffold).*

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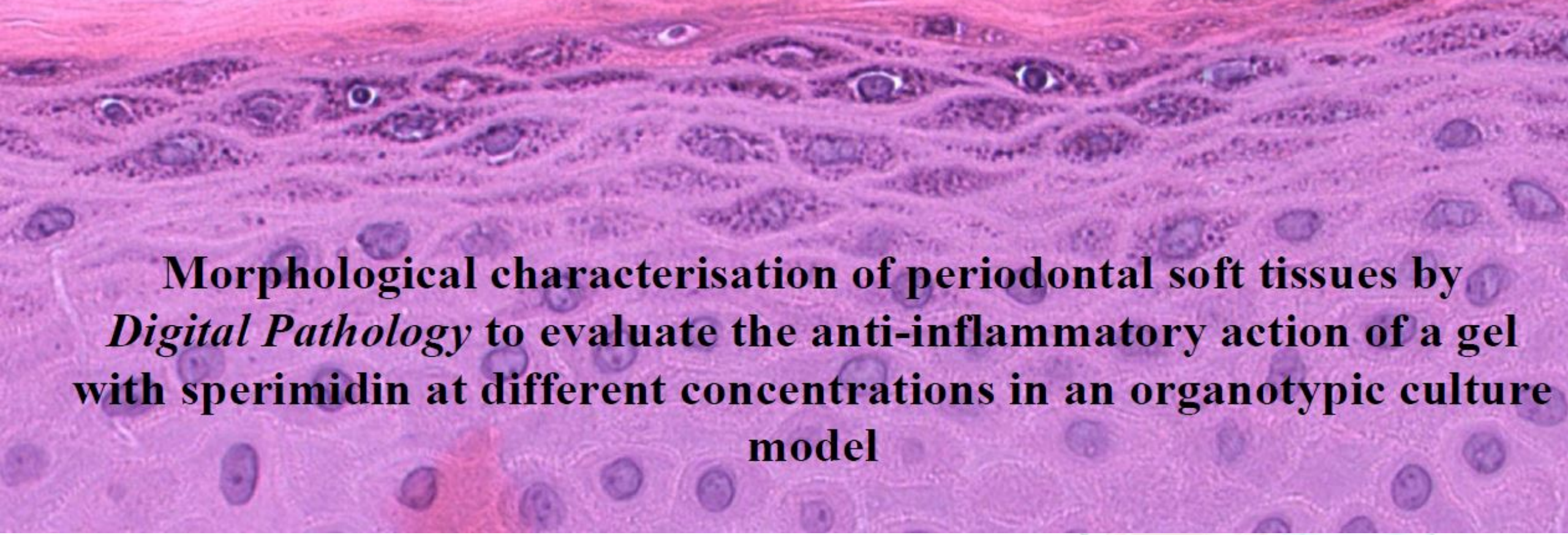

Morphological characterisation of periodontal soft tissues by *Digital Pathology* to evaluate the anti-inflammatory action of a gel with sperimidin at different concentrations in an organotypic culture model

Stage 1: Choosing the optimal gel concentration

Stage 2: Analysis on organotypic cultures

Dellavia C et al. 2020

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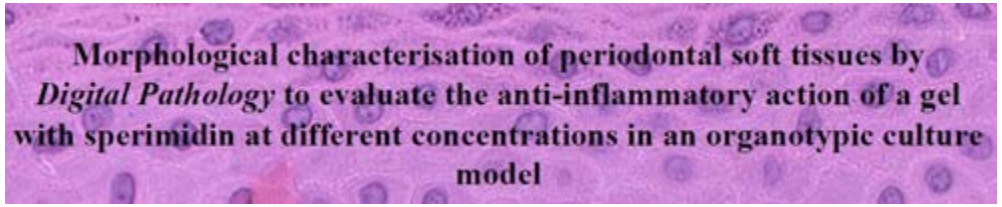
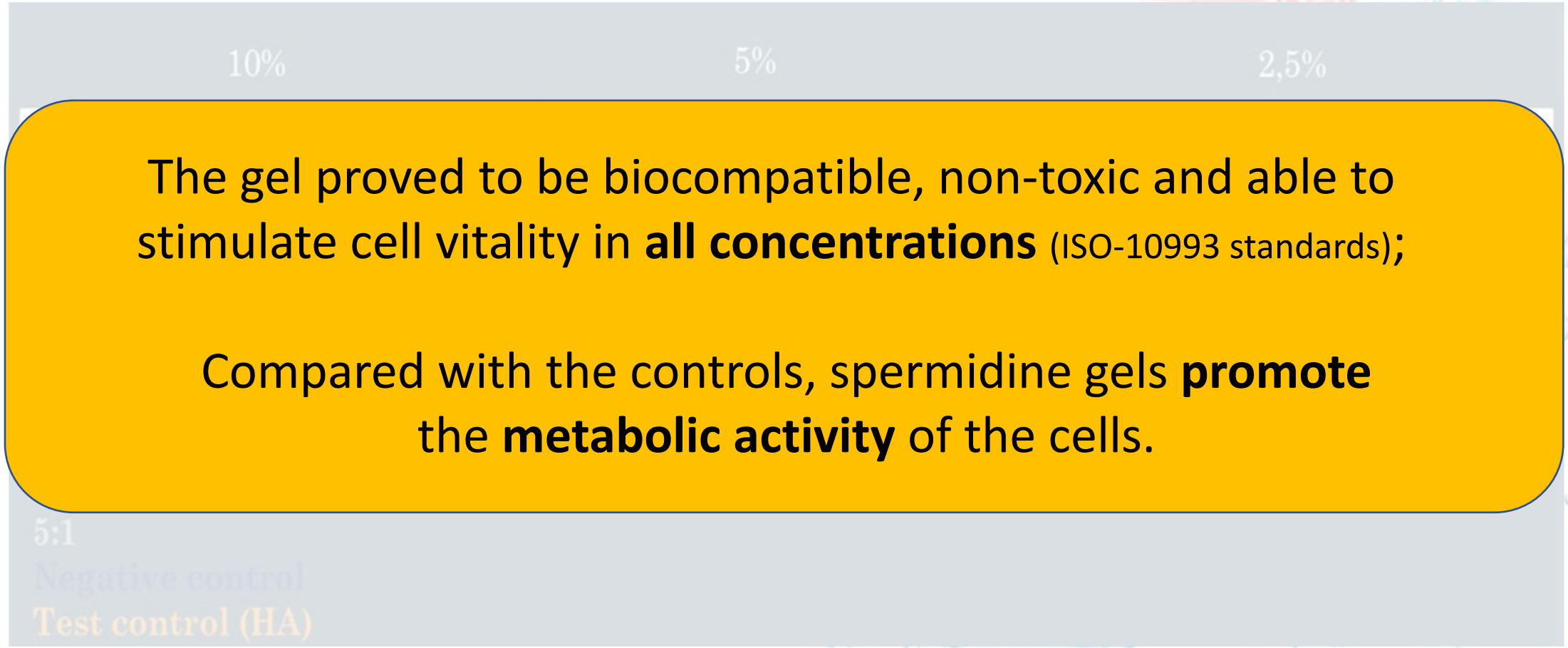
Stage 1: Choosing the optimal gel concentration

Test of vitality of the fibroblasts at 24 and 48 h



Stage 1: Choosing the optimal gel concentration



The gel proved to be biocompatible, non-toxic and able to stimulate cell vitality in **all concentrations** (ISO-10993 standards);

Compared with the controls, spermidine gels **promote** the **metabolic activity** of the cells.

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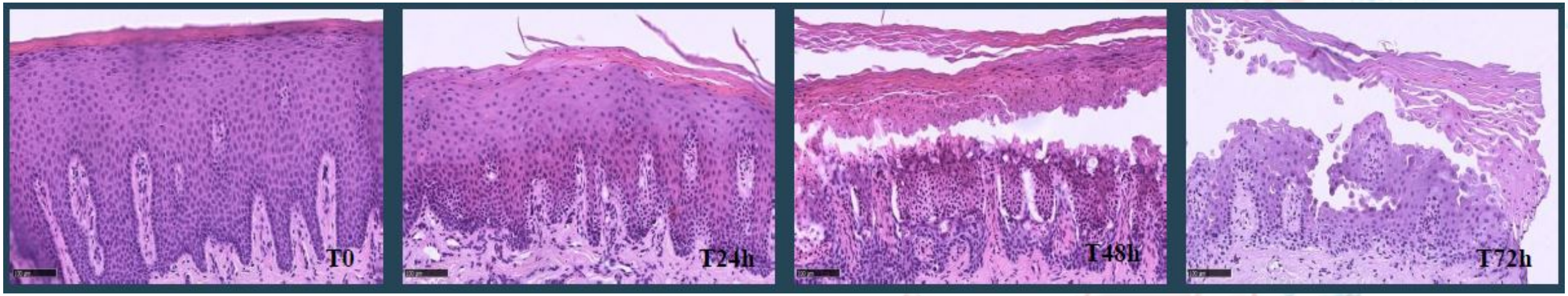
Stage 2: Analysis on organotypic cultures

No treatment

Hematoxylin Eosin, total magnification, 40x, 150x.



T0
Gingival health (no inflammatory lesions)

T24h:
Detachment of the corneal layer; Thickening of the basal layes

T48h:
Detachment of the corneal and granular layers; basal layer with intense mitotic activity

T72h:
Whole destruction of the epithelial and connective tissues

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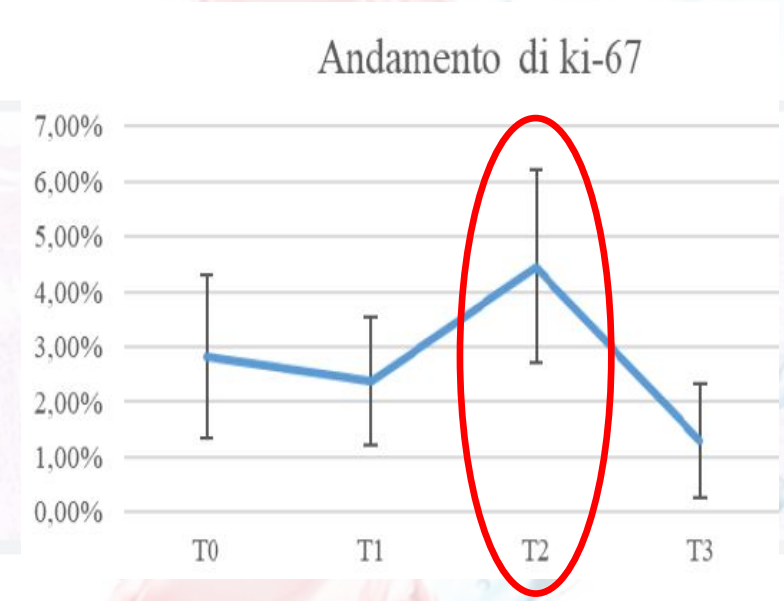
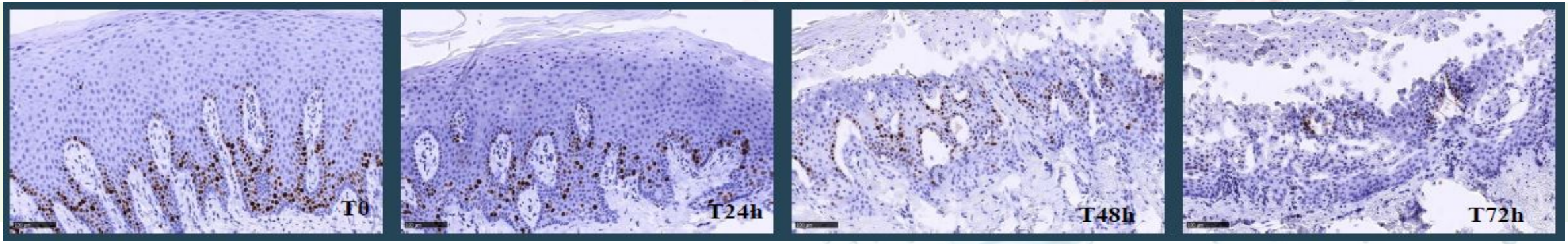
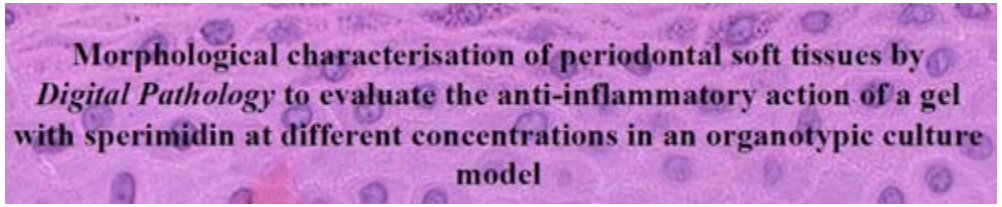
No treatment

Hematoxylin Eosin, total magnification, 40x, 150x.

Ki-67 performance is associated with the process of disintegration of the epithelial tissue







Stage 2: Analysis on organotypic cultures

In the presence of spermidine gel, do the cells of the oral mucosa in the culture continue to proliferate until T72h?

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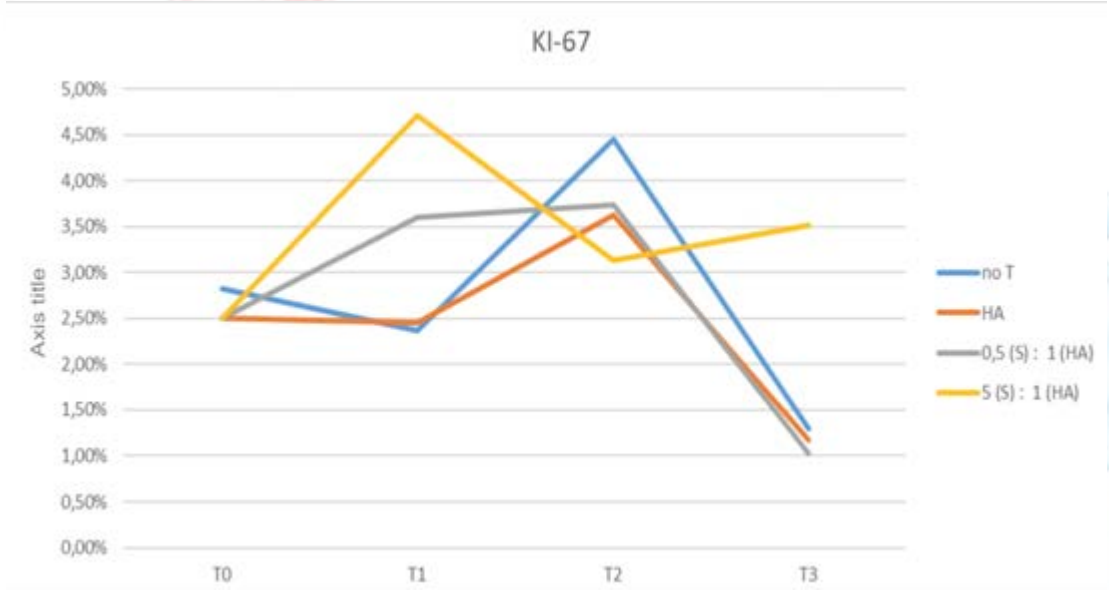
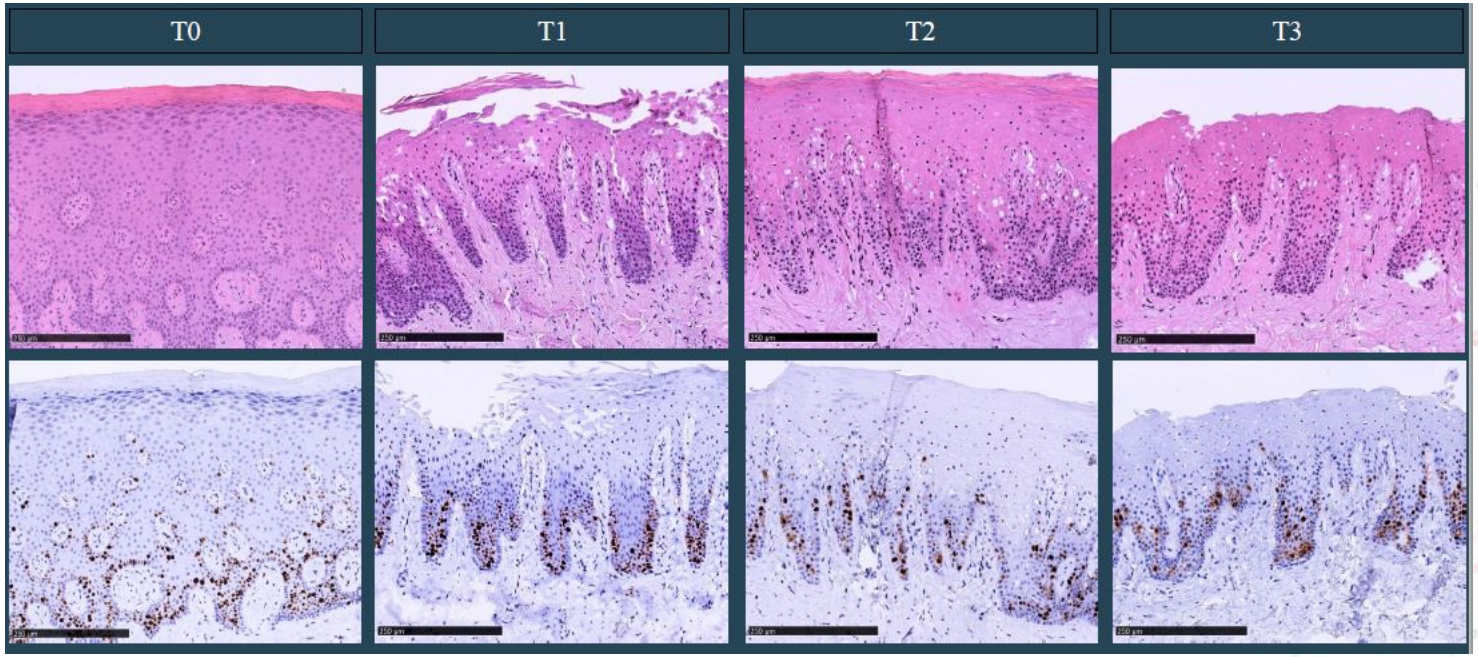
Stage 2: Analysis on organotypic cultures



5(S):1(HA)



S: spermidine **HA**: hyaluronic acid

Spermidine gel helps to maintain tissue in a slightly disrupted state up to 72h.

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Ki-67 remains until after 72h

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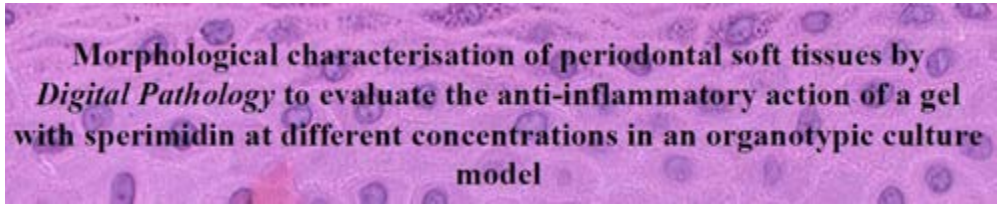
Stage 2: Analysis on organotypic cultures

All spermidine gels **improve the cells' ability to remain joined** together longer than the controls not treated;

Cells **maintain their proliferatice capacity** up to 72h (especially for Gel 5S: 1HA).



Stage 2: Analysis on organotypic cultures

The **optimal gel concentration** should have an intermediate ratio between **0,5 (S) : 1 (HA)** and **5 (S) : 1(HA)**