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A New Potential Solution for Cell Viability in Avulsed Teeth

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Objectives The objective of this study was to determine a developed propolis hydrogel's capacity to maintain viability of human gingival fibroblasts cells (HGF-1) and evaluate its potential as avulsed teeth storage media before replantation.

Methods Two hydrogel samples (water and ethanol-based propolis extracts) were developed, and two different concentrations, 50% and 25%, of both samples were investigated. 100% phosphate buffered saline (PBS) served as a negative control. HGF-1 cells were treated with the hydrogels or PBS mixed with cell growth media (DMEM+10% FBS +1% antibiotics) for 1h and 6h. HGF-1 cells viability was measured fluorimetrically using the PrestoBlue reagent (Thermo Fisher Scientific).

Results The HGF-1 viability after 1 hour storing in different hydrogel samples were as follows: 66.12% and 88.93% in water-based 50% and 25% propolis extract, respectively; 118.86% and 102.71%, in ethanol-based 50% and 25% propolis extract, respectively. PBS-immersed HGF-1 viability after 1 hour was 94.93%. After 6 hours measurements were repeated and revealed 90.26% and 91.99% of HGF-1 viability in water-based 50% and 25% propolis hydrogel while the corresponding figures for ethanol-based 50% and 25% propolis hydrogel were 114.7% and 83.22%, respectively. After 6 hours in PBS, only 71.84% HGF-1 remained viable.

Conclusions Hydrogels containing propolis extracts can effectively preserve HGF-1 cells viability for at least 6 hours and could be considered a valuable option of avulsed teeth storage media prior to replantation.