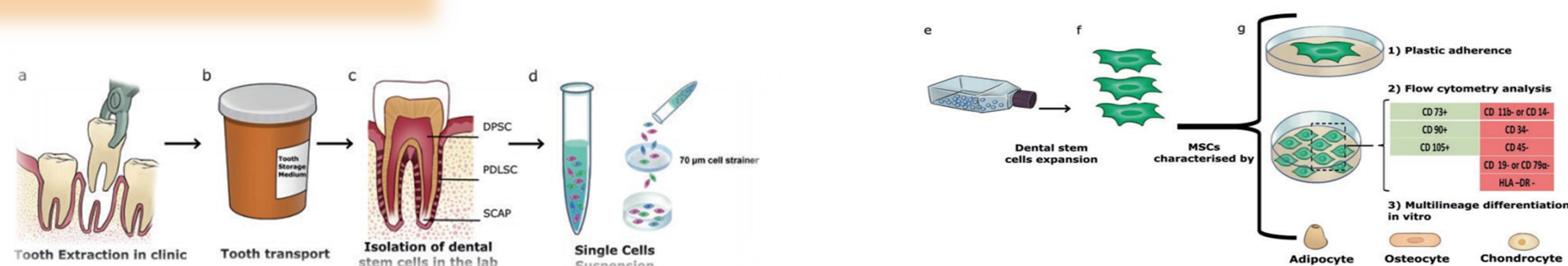


## Objective

- Mesenchymal stem cells, which are abundant in dental tissues, have the potential to be utilized in tissue engineering applications. The role of dental pulp-derived stem cells (DPSCs) is crucial, especially in the phases of inflammation and recovery that arise from severe cavities or restorative procedures.
- TEGDMA, a resin monomer, is frequently employed in the composition of composite resins and dentin bonding agents to reconstruct deteriorated tooth structures resulting from fractures or cavities.
- The objective of this investigation is to examine the impact of TEGDMA on pulpal stem cells obtained from both healthy and caries-affected sources.

## Methodology

- Tissue specimens were obtained from two distinct groups, namely healthy pulp (HP) and affected (DP) pulp, comprising a total of 16 patients.
- Samples were collected from third molar teeth that were either impacted or semi-impacted, without differentiation between the maxillary and mandibular arches.
- Following the characterization of pulp tissue and subsequent cell culture procedures, the application of TEGDMA and corresponding dosage groups for cellular treatment were established.



MTT, Senescence, and apoptosis were tested.

GraphPad Prism performed biostatistical analyses. Analyses employed two-way Anova.  $p < 0.05$  was accepted. \*: Significant. \*\*: Highly significant.  $p < 0.001$  (\*\*): Highly significant. (\*): Borderline relevance.  $p > 0.10$ : No significant difference.

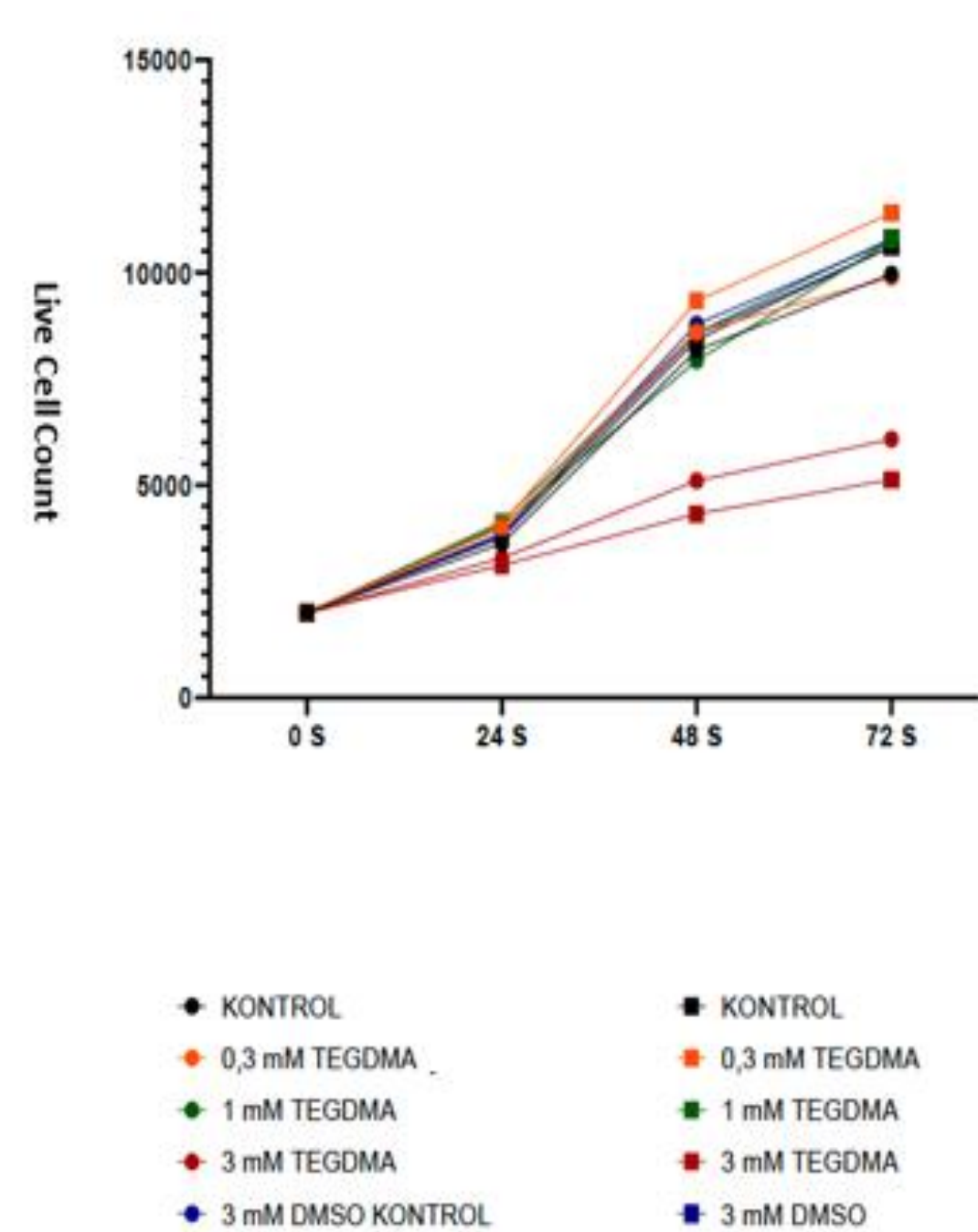
The current investigation involves to the characterization of mesenchymal stem cells sourced from dental pulp.

## Results

### MTT Proliferation Assay

At 0, 24, 48, and 72 hours, HH7 and DD7 demonstrated equivalent cell division and viability in HH1 and DD1 groups and DMSO controls.

The HH2 group exposed to 0.3 mM TEGDMA had the highest MTT test results at 72 hours.



Dosages /Cells	Healthy Pulp	Decayed Pulp
Kontrol	HH1	DD1
0,3 mM TEGDMA	HH2	DD2
1 mM TEGDMA	HH4	DD4
3 mM TEGDMA	HH6	DD6
DMSO Kontrol*	HH7	DD7

## Results

### Senescence Assay

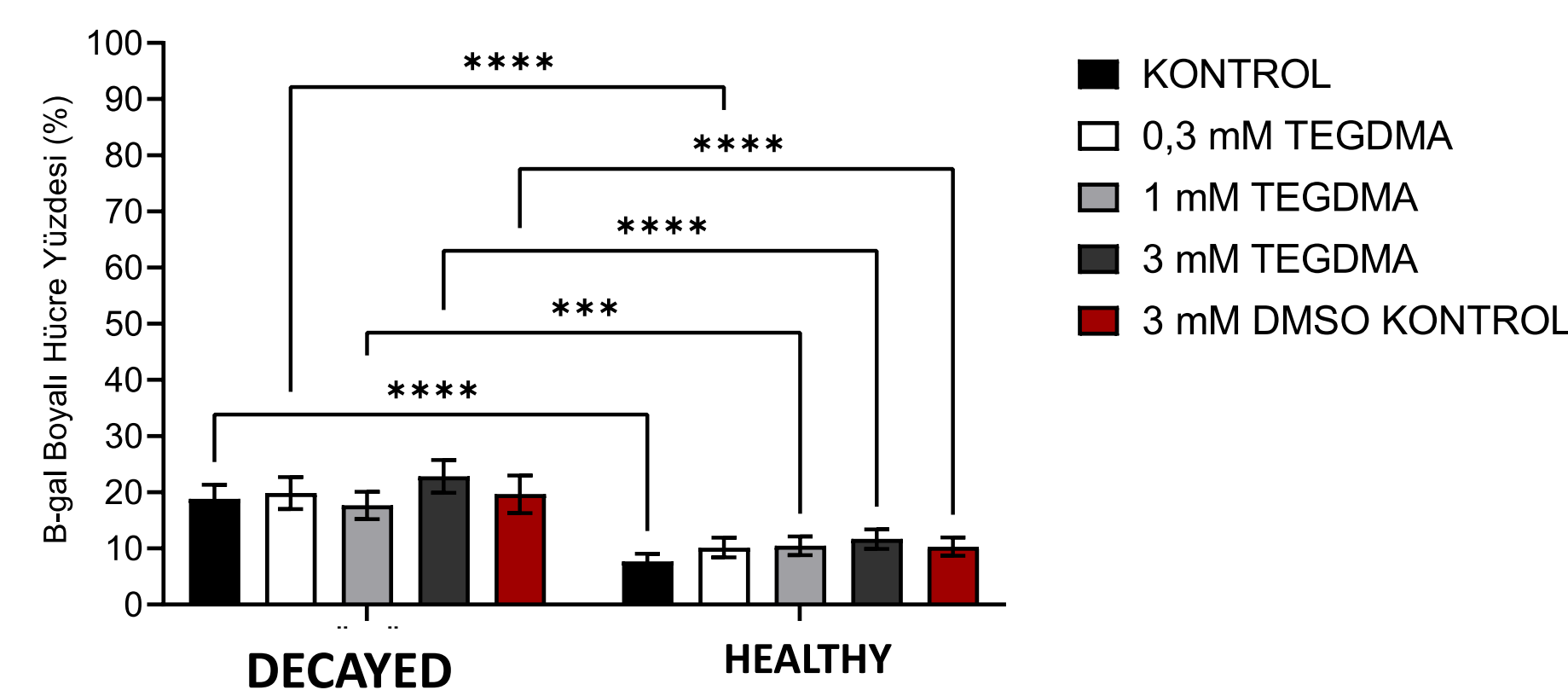
The findings indicate that there is a notable rise in senescence among carious (D) DPKHs prior to the administration of TEGDMA. The incidence of senescence was observed to be greater than anticipated in the DD6 cohort that was subjected to a concentration of 3 millimolar TEGDMA.

## Conclusion

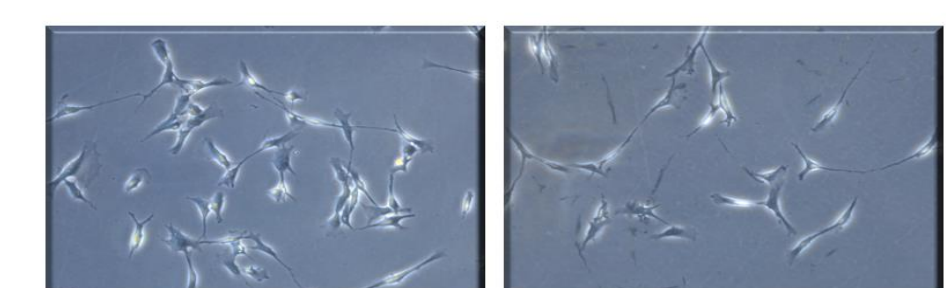
The primary objective of our study was to investigate potential variations in TEGDMA concentration among the H and D DPSC groups (HH2, HH4, HH6, DD2, DD4, DD6). In the context of dental interventions, it is imperative to consider the possibility of secondary caries arising from residual carious tissue in the treated region.

The present phenomenon has been demonstrated in the study. Significant findings have been acquired pertaining to the optimal range of TEGDMA concentration, which exhibits notable efficacy in the tissue.

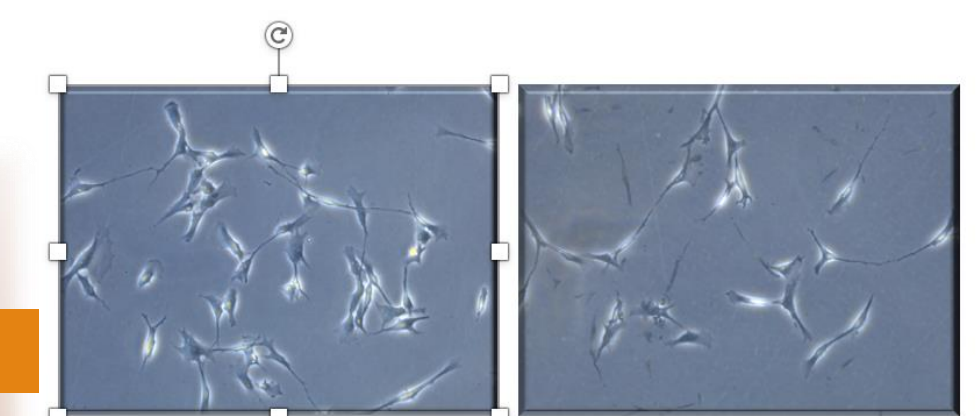
Research findings indicate that direct application of the monomer on the pulp or thin dentin barriers covering the remaining spaces leads to cell necrosis.



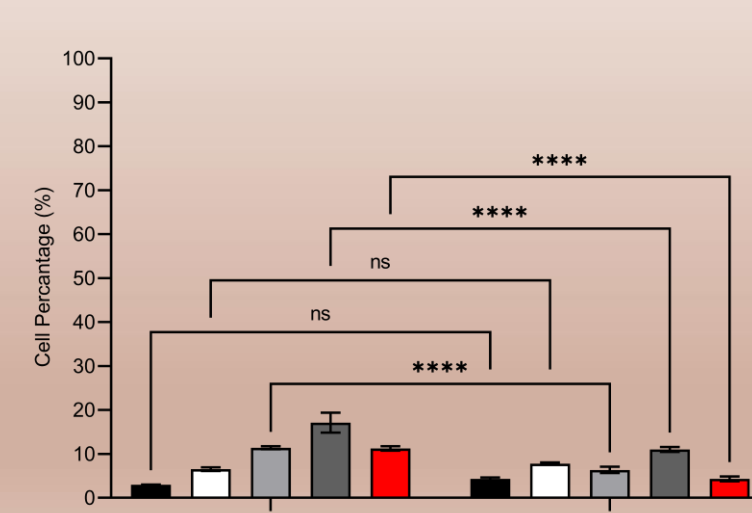
(H) DPSC B- Gal staining images



(D) DPSC B-Gal staining images



### Apoptosis Assay



GROUP	HH1	HH2	HH4	HH6	HH7
DEAD	%4.1	%3.2	%4.1	%6.5	%3.6
LIVE	%95.7	%92.2	%93.6	%89	%95.6
EARLY APOPTOSIS	%0.1	%2.9	%1.3	%0.2	%0.36
LATE APOPTOSIS	%0	%1.6	%0.9	%0.8	%0.33

#### Acknowledgments

The ethics committee decision of Erciyes University Clinical Research Ethics Committee, numbered 2019/573 and dated 24.07.2019, approved this study. Erciyes University Scientific Research Projects Unit funded the research project. The research was conducted at Erciyes University's Faculty of Dentistry and Erciyes University Genome and Stem Cell Center. There is no conflict of interests in this research project.