114 學年度牙醫學系大學生暑期研究計畫 研究題目與研究摘要

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題目一

中文題目：低氧條件下，褪黑激素對牙周韌帶纖維母細胞存活率與 HIF-1α 表現的影響

英文題目：Effect of Melatonin on Survival Rate and HIF-1α Expression of Periodontal Ligament Fibroblasts under Hypoxia

中文摘要

本研究旨在探討褪黑激素於低氧環境下對人類牙周韌帶纖維母細胞（PDL fibroblasts）存活率及 HIF-1α 蛋白表現的影響。牙周韌帶纖維母細胞為牙周組織修復與再生的重要細胞類型，低氧微環境可能影響其功能。研究設計將於 1%氧氣濃度條件下培養 PDL 細胞，並分別添加不同濃度的褪黑激素進行處理。細胞存活率將以 CCK-8 assay 測定，HIF-1α 蛋白表現量則以 Western blotting 進行分析。本研究預期可了解褪黑激素是否具備在低氧條件下促進牙周細胞存活及調控 HIF-1α 表現之潛能，對牙周再生醫學提供參考依據。

英文摘要

This study aims to investigate the effects of melatonin on the survival rate and HIF-1α protein expression of human periodontal ligament fibroblasts (PDL fibroblasts) under hypoxic conditions. PDL fibroblasts play a critical role in periodontal tissue repair and regeneration, and hypoxic microenvironments may influence their functions. In this study, PDL cells will be cultured under 1% oxygen conditions and treated with various concentrations of melatonin. Cell viability will be assessed by CCK-8 assay, and HIF-1α protein expression will be analyzed by Western blotting. This research is expected to elucidate whether melatonin promotes cell survival and modulates HIF-1α expression under hypoxia, providing insights for periodontal regenerative medicine.