The European Journal of Orthodontics, Volume 19, Issue 6: December 1997.

Osteoblast-like properties of human periodontal ligament cells: an *in vitro* analysis

EK Basdra and G Komposch

Department of Orthodontics and Dentofacial Orthopedics, School of Dental Medicine, University of Heidelberg, Germany

Identifying the biological properties of the cells residing within the periodontal ligament (PDL) will help in understanding the role that these cells play in the various functions of the periodontal ligament, and will improve the success of clinical procedures such as orthodontic tooth movement. For this purpose, fibroblasts isolated from human peridontium were cultured and characterized both histochemically and biochemically with respect to their putative osteoblast-like properties.

Histochemically, cultured PDL fibroblasts showed an intense staining for alkaline phosphatase (ALP). Biochemically the basal ALP activity increased in culture over time. ALP levels after stimulation with 1[agr], 25-dihydroxyvitamin D_3 were significantly higher than those of control cultures. Moreover, immunofluorescence against osteocalcin (a highly reliable osteoblastic marker) was strongly positive. Von Kossa staining of the cell cultures revealed the formation of mineral-like nodules. These results indicate that human PD fibroblasts exhibit *in vitro* phenotypic characteristics consistent with osteoblast-like cells, thus suggesting that such cells have the potential to differentiate into osteoblasts and/or cementoblasts.

Pages 615-621
