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EXPRESSION OF THE OSTEOBLAST MEMBRANE PROTEIN BRIL IN TOOTH AND PERIODONTAL TISSUES DURING DEVELOPMENT AND FOLLOWING TOOTH MOVEMENT

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Bone-restricted Ifitm-like protein (BRIL) is an osteoblast-specific membrane protein with a potential role in mineralization. The objective of this study was to evaluate its expression pattern in tooth and surrounding periodontal tissues during development and experimental tooth movement in rodents. Mice collected on embryonic day E14.5 and E17.5, postnatal day 4, and 4 weeks-old were used for the development study. Adult male rats were used for tooth movement and sacrificed after 3 and 5 days. Tissues were decalcified and processed for paraffin embedding and immunohistochemistry with an anti-BRIL antibody. At embryonic stage E14.5, BRIL was immunodetected throughout the forming intramembranous bone of the jaw. By day E17.5, BRIL was strongly associated with osteoblasts of the forming alveolar bones and with differentiating incisor odontoblasts. At day 4 postnatal, BRIL staining was also seen in differentiating molar odontoblasts. In adult animals, in addition to osteoblasts and young incisor odontoblasts just prior to mantle dentin mineralization, cementoblasts from cellular cementum were also immunoreactive. At day 3 following tooth movement, BRIL was upregulated in alveolar bone on the tension area and over the facing cellular cementum. BRIL appeared stronger on the compression site only at day 5. At sites of active matrix deposition, BRIL was also associated with newly entrapped but not with mature osteocytes. In conclusion, the distinctive pattern of expression and localization of BRIL observed during development and tooth movement suggest it may mediate cell and/or matrix events on bone forming surfaces and have a functional correlation with mechanical stress.

Keywords: *Bril; osteoblast; cementoblast; odontoblast; bone remodeling; tooth movement*