AAO Foundation Award Final Report

Principal Investigator	Dr. Kang Ting
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Award Type	Biomedical Research
Project Title	Characterization of nel-homolog, a de novo gene with EGF-like repeats, in craniosynostosis
Project Year	1997
Institution	University of California at Los Angeles
Summary/Abstract	Previously, we formulated a hypothesis that premature cranial suture fusion in non-syndromic and non-familial unilateral coronal synostosis (UCS) results from local alterations in gene expression patterns at the abnormal suture site. Preliminary histomorphometric studies on unilateral coronal synostosis showed abnormally active bone remodeling in the site of premature suture fusion in UCS patients. Differential display results on UCS samples suggests that certain genes were differentially expressed during premature suture closure. One gene we identified showed a high nucleotide sequence homology of 88% to the *nel* protein in rats. We cloned the full length of 1800 nucleotides without counting the poly A tail. As a comparison, the *nel* protein in chicken embryo has five EGF-like repeats and is strongly expressed in neural tissue in chick embryos. Human *nel*-homolog we isolated is a smaller homolog with approximately 250 amino acid shorter than chicken *nel* (835 AA) at the N-terminal. The human *nel*-homolog is overexpressed in the abnormal suture sites on four sets of UCS samples. *In situ* hybridization further localized that active osteoblasts are the major cell type responsible for *nel*-homolog expression during abnormal suture closure.