CELL AND DEVELOPMENTAL BIOLOGY

BVES FUNCTION IN EPITHELIAL MOVEMENT DURING DEVELOPMENT

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I will introduce two novel genes isolated by my laboratory, *hole* and *bves*. This document will show that the benefits of gene discovery are invaluable. Bves, a novel family of cell adhesion molecules have been identified and my dissertation will be the first illustration of a function of this molecule *in vivo*. Data derived from this dissertation provide strong *in vitro* and *in vivo* evidence that *bves* plays an adhesive role in epithelial adhesion and morphogenetic movements during gastrulation in *Xenopus* and eye morphogenesis. Though gastrulation and eye development occur at different times during development and result in two very different structures, they serve as examples of a fundamental role Bves serves throughout embryogenesis. *Xbves* is expressed in a distinct group of epithelial and migrating cells in the *Xenopus* embryo. *In vivo* studies in the *Xenopus* embryo show that Xbves is required for proper migration of epithelial animal cells. The same migration defect is seen in an *in vitro* model of corneal epithelial cells. Combined with previous data that show *bves* participates in epithelial to mesenchymal transition in epicardium and coronary artery development, as well as data that show *bves* expression across many tissues, the data presented here support the idea that one gene product can participate in a variety of developmental processes. This study is an important contribution to understanding the overall larger concept of how *bves* functions in embryogenesis and the adult. Taken together, these studies have shown that Bves is important in proper epithelial cell migration and morphogenesis.