

For: 15th International Society of Developmental Biologists Congress 2005 (Sydney)

Embryonic germ cells do not ‘migrate’ – the embryo simply grows around them.

*Freeman, B**

University of New South Wales, Sydney, NSW, Australia

Despite the manifold claims for migration of cells during normal embryonic development, few authors provide a frame of reference for the migration or a velocity; both are necessary to prove independent cell movement. Since it is now appreciated (i) that sclerotomal cells do not migrate to form the axial skeleton, (ii) that cranial neural crest cells do not migrate to form facial mesectoderm, and (iii) that mesoderm cells do not migrate from the primitive streak, it is essential to review the evidence for the active migration of germ cells. The seminal paper (Witschi, 1948. CICE 32:67) claiming amoeboid germ cell migration in the human embryo has been re-examined using the notochord as the natural internal reference frame. Regional comparison of human embryos with respect to the notochord shows that there is no active migration of germ cells and that their displacement can be explained as the result of global growth (so called morphogenetic) movements of the embryo combined with local anchoring of germ cells. Artefactual movements of explanted germ cells or the fortuitous appearances of dead cells in microscopes have no relation to the dynamics of actual growth. The study of human embryos forces a re-examination of evidence for the active migration of germ cells in other species, such as the mouse, where the significance of growth movements has been generally overlooked. Indeed, a review of the history of cytologism reveals that a century ago developmental biologists had a clearer concept of the whole organism than some modern scientists.