Tracking migration during human T cell development.

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Authors: Joanna Halkias, Heather J Melichar, Kayleigh T Taylor, Ellen A Robey

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Public Summary:
Specialized microenvironments within the thymus are comprised of unique cell types with distinct roles in directing the development of a diverse, functional, and self-tolerant T cell repertoire. As they differentiate, thymocytes transit through a number of developmental intermediates that are associated with unique localization and migration patterns. This transition is associated with dramatic changes in cell surface proteins needed to direct the maturing thymocytes within the thymus. This review discusses the dynamic changes in behavior that occur throughout thymocyte development, and provides an overview of the cell-intrinsic and extrinsic mechanisms that regulate human thymocyte migration.

Scientific Abstract:
Specialized microenvironments within the thymus are comprised of unique cell types with distinct roles in directing the development of a diverse, functional, and self-tolerant T cell repertoire. As they differentiate, thymocytes transit through a number of developmental intermediates that are associated with unique localization and migration patterns. For example, during one particular developmental transition, immature thymocytes more than double in speed as they become mature T cells that are among the fastest cells in the body. This transition is associated with dramatic changes in the expression of chemokine receptors and their antagonists, cell adhesion molecules, and cytoskeletal components to direct the maturing thymocyte population from the cortex to medulla. Here we discuss the dynamic changes in behavior that occur throughout thymocyte development, and provide an overview of the cell-intrinsic and extrinsic mechanisms that regulate human thymocyte migration.