Epithelial: Gastrointestinal and Skin

Epithelial cells constitute at least 60% of all differentiated cells in the body. All epithelial tissues such as the skin and the epithelial linings of the gastro-intestinal tract contain stem cells that are capable of self renewal and differentiation. Exposures of these epithelia to environmental insult, together with genetic factors and ageing, result in debilitating conditions such as chronic ulcers, wound healing defects, chronic obstructive pulmonary disease, Crohn?s disease, and corneal degeneration. Congenital mutations in single genes result in devastating diseases of the skin and other epithelia, such as Xeroderma Pigmentosum, Basal Cell Nevus syndrome or Epidermolysis Bullosa.

The Epithelial Disease Pipeline focuses on therapeutic applications of stem cells for either common, chronic disease or rare, but very severe diseases of epithelial origin.

These studies will be facilitated by the knowledge of the localization and properties of stem cells from epithelia such as the skin or intestine. The purification of these stem cells and the study of their conversion into different lineages make it feasible to repair genetic or functional defects in these stem cells, and to use them for transplantation in severely affected patients. This program also investigates the risks of stem cell therapy resulting in tumor development in the recipient. At least 85% of all human cancers arise in epithelial tissues such as the skin, colon, breast and prostate, and there is increasing evidence that the most malignant tumors arise from epithelial stem cell populations.
The Gastrointestinal and Skin pipeline is directed by Drs. Allan Balmain and Ervin Epstein.

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