

Models of Cytokine and Cytokine Receptor Alterations in Diseases

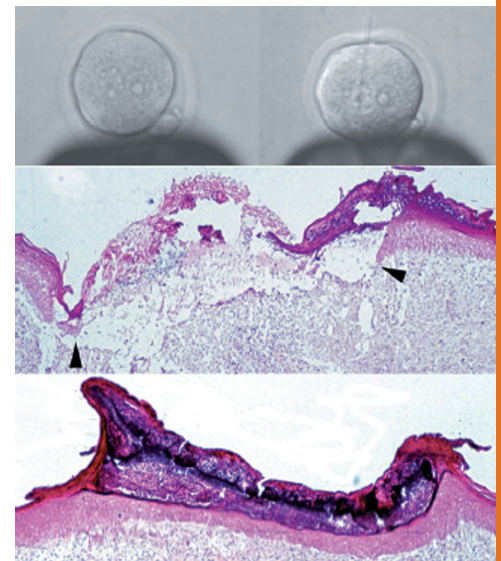
» Prof. Dr. Manfred Blessing

The number of identified genetic polymorphisms linked to susceptibility to diseases is steadily increasing in the wake of the completion of the human genome project. In addition, completion of the mouse genome project in conjunction with the availability of tools for precise genetic modification enables a functional analysis of these disease-linked alterations in a mammalian model organism. The research group of Prof. Dr. Manfred Blessing is mainly studying the effects of cytokine and cytokine signaling mutations in the context of inflammatory diseases and malignancies. A central subject of research is the cytokine transforming growth factor- β . TGF- β is a pleiotropic cytokine displaying different activities dependent on cell-type, developmental stage, differentiation and cell cycle position of the target cell. Depending on these parameters, TGF- β modulates proliferation, apoptosis, activation

and differentiation of the respective target cells. Prominent activities include (i) inhibition of epithelial cell proliferation, (ii) stimulation of fibroblast extracellular matrix synthesis, (iii) angiogenesis, (iv) protection of early thymic T-cells from apoptosis and (v) suppression of mature T-cells and macrophages. Due to this broad spectrum of activities, TGF- β is a central player in regeneration, immune responses and tumorigenesis. By selectively interfering with TGF- β activity or signaling in genetically engineered mice, the researchers are mimicking in these animal models pathological processes observed in patients. The cell-type specificity of our approach may allow for the identification of cell-type specific TGF- β target genes as targets for diagnostic or therapeutic use.

Keywords

- Growth Factors
- Wound Healing
- Transgenesis



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