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Research

RESEARCH ACTIVITY

Our research focuses on molecular and cellular mechanisms, which support the in vivo function of chemokines (chemotactic cytokines). Almost 50 different homologous human chemokines signal through 20 different cognate G-protein coupled receptors to elicit multiple cellular effects, most notably, cell migration. By this virtue, chemokines orchestrate intricate cellular moves and interactions, which are taking place during various pathophysiological processes ranging from fertilization and embryogenesis to, most conspicuously, immunity and inflammation. In addition, chemokines induce a broad spectrum of alternative cellular responses, including cell proliferation, differentiation, apoptosis, senescence etc. Also, as recognized recently, they play a physiological role in brain function. Chemokines and their receptors are fundamental players in cancer development, growth and spread. They are involved in providing signals required for tumor cell survival, proliferation and migration and determine host-tumor interactions. The latter include angiogenesis and stromal reactions as well as immunity and tolerance to the emerging tumors. Recently a group of atypical chemokine receptors (also known as interceptors) emerged as powerful contributors to chemokine homeostasis and their functions in vivo. Currently interceptors include Duffy antigen, D6, CXCR7, CCRL1 and CCRL2. The unifying feature of Interceptors is their ability to internalize cognate chemokines in the absence of conventional G-protein mediated signaling. Chemokines acting through their receptors and modified by interactions with interceptors constitute building blocks of the largest coherently functioning intercellular communication system, the cell Esperanto.

Publications

Hochegger, K., Weber, T., Pruenster, M., Rosenkranz, A.R. and Rot, A. The defect in regulatory T cell function causes exaggerated anti-glomerular basal membrane glomerulonephritis in CCR7 deficient mice. J Am Soc Nephrol 21: 42–52, 2010

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Schneider, M.A., Meingassner, J., Lipp. M, Moore, H. and Rot, A. CCR7 is required for the in vivo function of CD4 CD25 regulatory T cells. J. Exp. Med. 204:735-745, 2007

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Expertise

Chemokines, their receptors and interceptors in immunity; inflammation and cancer

Alternative contact number available for this expert: **contact the press office (http://www.birmingham.ac.uk/news/contacts/index.aspx)**