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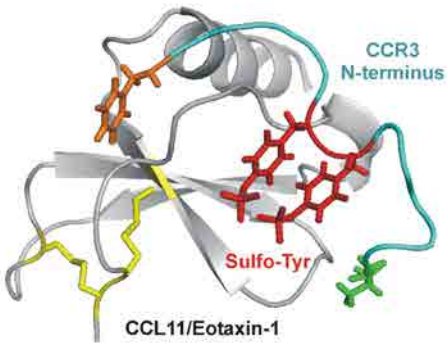
Inflammation is the response of a tissue and its microvascular system to injury or infection. A hallmark of inflammation is the accumulation of leukocytes (white blood cells), which remove pathogens and necrotic tissue by phagocytosis and proteolytic degradation. However, excessive leukocyte recruitment or activity leads to the release of toxic substances and degradation of healthy tissue, i.e. inflammatory disease.

Leukocyte recruitment in inflammation is controlled by the expression and secretion of small proteins called chemokines at the site of inflammation and by the subsequent interaction of those chemokines with chemokine receptors located on the surfaces of circulating leukocytes. A detailed understanding of chemokine-receptor interactions is required in order to rationally develop novel therapeutic agents against inflammatory diseases. Our group is investigating several important aspects of chemokine and chemokine receptor biochemistry with the overall goals of better understanding and ultimately controlling their biological functions.

Research Projects

1. **Biased receptor agonism by chemokines**
2. **Structural basis of chemokine recognition**
3. **Tick evasins – Natural chemokine antagonists**



CCL11-CCR3 Complex.

Selected significant publications:

1. Millard CJ, Ludeman JP, Canals M, Bridgford JL, Hinds MG, Clayton DJ, Christopoulos A, Payne RJ, **Stone MJ**. 2014. Structural basis of receptor sulfotyrosine recognition by a CC chemokine: The N-terminal region of CCR3 bound to CCL11/Eotaxin-1. *Structure* 22, 1571-1581.
2. Ludeman JP, **Stone MJ**. 2014. The structural role of receptor tyrosine sulfation in chemokine recognition. *British J. Pharmacol.* 171, 1167-1179.
3. Tan JHY, Ludeman JP, Wedderburn J, Canals M, Hall P, Butler SJ, Taleski D, Christopoulos A, Hickey MJ, Payne RJ, **Stone MJ**. 2013. Tyrosine sulfation of chemokine receptor ccr2 enhances interactions with both monomeric and dimeric forms of the chemokine Monocyte Chemoattractant Protein-1 (MCP-1). *J. Biol. Chem.* 288, 10024–10034.
4. Tan JHY, Canals M, Ludeman JP, Wedderburn J, Boston C, Butler SJ, Carrick AM, Parody TR, Taleski D, Christopoulos A, Payne RJ, **Stone MJ**. 2012. Design and receptor interactions of obligate dimeric mutant of chemokine Monocyte Chemoattractant Protein-1 (MCP-1). *J. Biol. Chem.* 287, 14692-14702.
5. Simpson LS, Zhu JZ, Widlanski TS, **Stone MJ**. 2009. Regulation of chemokine recognition by site-specific tyrosine sulfation of receptor peptides. *Chemistry & Biology* 16, 153-161.