Abstract:
The role of chemokines and their receptors in controlling several physiological and pathological processes has only become evident in the last couple of years. From a sole function of chemo-attraction, our view on chemokine receptor activation has switched to the regulation of pleiotropic signaling pathways influencing numerous molecular and cellular processes. The large number of chemokines and receptors and hence possible combinations of chemokine-chemokine receptor interactions, as well as the expression profiles of chemokines and chemokine receptors within particular cell types, has contributed to the complexity of chemokine receptor signaling as we see it today. The chemokine CCL2 and its main chemokine receptor CCR2 have been implicated in the pathogenesis of several different disease processes, including vascular permeability and attraction of immune cells during metastasis, a number of different neurological disorders, autoimmune disease, obesity, and atherosclerosis. Here we review recent findings on the role of the CCL2-CCR2 axis in the regulation of these diseases. We believe that research has only gained a first glimpse of what chemokines can control and what the underlying mechanisms are. There is certainly more to be found that will - with high certainty - have strong implications for clinical applications in the near future.