ImmunoTools *special* Award 2015

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PostDoc

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The role of leukocytes on inflammation and osteoarthritis.

At the department of Experimental Rheumatology of the Radboud Institute for Molecular Life Sciences, we investigate the initiation and progression of rheumatoid arthritis, osteoarthritis and systemic autoimmune diseases and search for novel targets for therapy to improve the quality of life of patients suffering from these diseases. My field of expertise is investigating the role of inflammatory proteins on leukocytes during osteoarthritis and their effects on joint pathology.

Osteoarthritis is a chronic degenerative disease of the joints and its high prevalence further increases due to the aging population. Current treatment options focuses on targeting the symptoms and are limited to painkillers and anti-inflammatory drugs. Therefore, novel therapies that focus on preventing joint damage are warranted.

The etiology of osteoarthritis is multi-factorial, and is mainly driven by an activated synovium. In the (thickened) synovial lining layer of patients with early osteoarthritis, mainly activated monocytes/ macrophages are present. These activated monocytes/ macrophages produce high levels of pro-inflammatory proteins. We postulate that the inflammatory state of the joint determines what cell types will be attracted and that this will affect the amount of cartilage and bone destruction. Monocytes/ macrophages can be divided into two subpopulations. There are the ‘bad’ pro-inflammatory monocytes/ macrophages which drive disease pathogenesis, and the ‘good’ pro-healing monocytes/ macrophages that promote the resolution of joint inflammation. We aim to investigate the effects of pro- and anti-inflammatory systems on monocytes/ macrophage subpopulations *in vitro* using different cell lines after stimulation with cytokines or not. Also, we aim to elucidate the effects of certain inflammatory proteins on the monocytes/ macrophage subpopulations during osteoarthritis in our *in vivo* murine models of osteoarthritis using knockout systems and pharmacological intervention. To translate it to clinical value, we want to analyze the expression profiles of monocytes/ macrophages in human subjects with osteoarthritis and healthy controls.

Therefore it is important to phenotypically characterize the pro-inflammatory and the pro-healing monocytes/ macrophages, and in addition determine the inflammatory state of these cells, using flow cytometry and ELISA. In order to characterize the cells mouse antibodies (CD3e, CD11b, CD19, CD45, CD62L, CD90, CD117, NK-cells, and erythroid cells), and human and mouse cytokines (IL-1β, IL-3, IL-6, MCP-1/ CCL2, MIP-1α/ CCL3, LIF, SCF, and TNF-α) of ImmunoTools will be of great help to investigate the role of leukocytes on inflammation and osteoarthritis. This will further increase our understanding of the pathophysiology of osteoarthritis.

The outcomes of our research are directly translated to the clinic by our close collaboration with the clinical departments of rheumatology of the St Maartens Clinic and the department of rheumatologic diseases of the RadboudUMC in Nijmegen. We hope to develop novel targets to improve the quality of life for patients with osteoarthritis.

ImmunoTools *special* AWARD for **Niels Cremers** includes 25 reagents

recombinant human cytokines: rh IL-1beta /IL-1F2, rh IL-6, rh MCP-1 / CCL2, rh MIP-1α / CCL3, rh TNFα,

FITC - conjugated anti-mouse CD11b, CD45, CD62L, CD117,

PE - conjugated anti-mouse CD3e, CD19, CD90, Erythroid cells, NK-cells,

APC - conjugated anti-mouse CD11b, CD45, CD62L,

recombinant mouse cytokines: rm IL-1beta, rm IL-3, rm IL-6, rm LIF, rm MCP1 / CCL2, rm MIP-1a/ CCL3, rm SCF, rm TNFa DETAILS more AWARDS