

## Utrecht Rheumatology Research (URR)



### Research directors

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The department of Rheumatology & Clinical Immunology of the University Medical Center Utrecht performs both clinical and translational research. All research is focused within the center of Utrecht Rheumatology Research (URR). The department of Rheumatology & Clinical Immunology is a vibrant department where the various research lines are inter-connected. The two major research lines encompass **(inflammatory) arthritis** (OA, RA and PsA) and **systemic (auto)immune diseases** (SSc, SLE, pSS & immune deficiencies).

Within the **(inflammatory) arthritis research line** emphasis lies on the identification of underlying pathways driving disease and tissue de-/regeneration. In that way we add to improving knowledge on development and application of targeted treatment. For RA we are studying treatment strategies in several prospective (randomized) trials where in addition clinical effectiveness, cost-effectiveness is a relevant item. Additionally, refractory (difficult to treat) RA is gaining more and more focus. For osteoarthritis the stratification of sub-types of the disease as well as development of novel treatment modalities (medical devices as well as pharma) are major items of research. Translational laboratory work is seamlessly integrated with cohort and clinical trial research. Within Psoriatic arthritis (PsA) we are exploring the role of several immune cell subsets in connection with the skin- and gut-microbiome in the progression from psoriasis to psoriatic arthritis as well as the coincidence of extra-intestinal complications such as IBD and uveitis.

To this aim Postdocs, PhD students, fellows, and technicians work in multidisciplinary settings combining amongst others microbiology, immunology, (bio)mechanics, biology expertise for optimal integration of knowledge to reach our goals. Research is embedded within the focus areas of the UMC Utrecht, 'regenerative medicine & stem cells' and 'immunology & infection'. Each have their own research facilities within the Regenerative medicine center Utrecht in the Hubrecht lab and the Laboratory of Translational Immunology (LTI).

The research on **systemic (auto)immune diseases** is also embedded in the LTI and has two aims. First, to molecularly reclassify diseases for personalized medicine strategies and 2) to provide a robust and efficient feed forward loop into basic and translational research lines. To this aim, it embarks on a novel research methodology that we embrace as Systems Medicine. The Systems Medicine initiative embraces a multi-omics technology followed by complex multi-dimensional computational modelling. We focus on different immune cell subsets such as monocytes, B cells, T cells, myeloid DCs and plasmacytoid DCs from which we determine multiple molecular omics layers including the transcriptome, methylome,

proteome, etc. To enable molecular re-classification of disease multiple disciplines – including medical researchers, biologists and computational biologist work closely together. Followed by computational modeling the identified molecular networks will be used for molecular (re)-classification of disease, to support clinical decisions and as a feed forward loop into basic and translational research within the laboratory