

## Clinical studies on infective and autoimmune disorders, hospital hygiene and infection control

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### Project descriptions:

- 1) Positron emission tomography (PET) in the diagnostics of infections and autoimmune vasculitis. The aims: a) to investigate the utility of PET/CT imaging in the diagnostics of infectious diseases and vasculitis b) to study imaging of infective endocarditis involving native/prosthetic valves, and of cardiac implantable device infections c) Besides the usefulness of 18FDG-PET/CT in patients with bacteremic *Staphylococcus aureus* infection our aim is to study whether another traces, 68 Ga, could give more information. d) to develop the diagnostic workup of vasculitis and the use of 18FDG-PET/CT and also to find a more sensitive tracer to be used in this patient group.
- 2) Imaging of neuroinflammation - focus on microglia. The aims: a) to study the pathological mechanisms of progressive MS, including microglial activation b) to apply PET imaging to the study of neuroinflammation in MS c) to develop treatments for neuroimmunological diseases where no treatment is yet available, such as progressive MS.
- 3) Neuroborreliosis study. a) The epidemiology and clinical findings are investigated and laboratory diagnostic tests being developed. b) In a randomized study (together with HUCH), oral antibiotic treatment is compared to intravenous antibiotic treatment.
- 4) Leukocyte surface receptor study. The aims: a) to study the expression patterns of leukocyte cell surface receptors in infectious/inflammatory diseases, b) to use multiparametric flow cytometric bacterial infection marker for distinguishing between febrile bacterial and viral infections in less than 30 min. The so called BI-INDEX test may effectively assist physicians in deciding whether antibiotic treatment is necessary, thus preventing the inappropriate use of antibiotics to treat non-bacterial infections.
- 5) Hospital hygiene and infection control. a) Performance of hand disinfection in Turku University Hospital (TUH) district, b) Healthcare associated infections in the ICU in TUH, c) Impact of antibiotic resistant bacteria on health care in TUH district.
- 6) Building and use of local HIV patient register to combine data to national "Inficare" register, aiming to collect data on different HIV patient groups e.g. outcomes of pregnancies, quality of life etc.
- 7) Studies on rheumatologic disorders and autoimmunity. The aim: To collaborate with Auria biobank and local rheumatologic registry combining data of serum antibodies with clinical data of patients with immunological disorders – in order to develop the use of novel biological therapies in autoimmune diseases.
- 8) Prospective studies on patients with invasive group A and group G streptococcal (iGAS and iGGS) infection. The aims: a) to study the epidemiology, predisposing factors and outcome of infection b) to study (in a randomized placebo controlled setting) the efficacy of intravenous immunoglobulin (IVIG) therapy in patients with iGAS or iGGS infection c) to study the pathogenesis of iGAS and iGGS infections applying e.g. transcriptome analysis of patients (together with Tampere University Hospital)

9) Infective endocarditis (IE) in Finland. The aims: a) to study retrospectively the epidemiology and outcome of patients with IE b) to develop diagnostic modalities and timing and choice of conservative and operative treatments in order to minimize complications and mortality of patients with IE.

#### Publications:

- Laurikainen E, Rintala E, Kaarto A-M, Routamaa M. Adherence to surgical hand rubbing directives in Hospital District of Southwest Finland. **Infect. Dis.** **2016**;48:116-21.
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- Salomäki SP, Saraste A, Kempainen J, Bax JJ, Knuuti J, Nuutila P, Seppänen M, Roivainen A, Airaksinen J, Pirilä L, Oksi J, Hohenthal U. 18F-FDG Positron Emission Tomography / Computed tomography in Infective Endocarditis. **J Nucl Cardiol**; **2015** Dec 9.
- Hytönen J, Kortela E, Waris M, Puustinen J, Salo J, Oksi J. CXCL13 and neopterin concentrations in cerebrospinal fluid of patients with Lyme neuroborreliosis and other diseases that cause neuroinflammation. **J. Neuroinflammation** **2014**;11:103.
- Oksi J. Clostridium difficile infection: review with special interest in hematologic patients. **Drugs and Cell Therap Hematol** **2014**; 3:89-100.
- Uusitalo-Seppälä R, Huttunen R, Aittoniemi J, Koskinen P, Leino A, Vahlberg T, Rintala EM. Pentraxin 3 (PTX3) is Associated with Severe Sepsis and Fatal Disease in Emergency Room Patients with Suspected Infection: a Prospective Cohort Study. **PLoS ONE** **2013**; 8(1): e53661.
- Pietikäinen A, Maksimow M, Kauko T, Hurme S, Salmi M, Hytönen J, Cerebrospinal fluid cytokines in Lyme neuroborreliosis. **J. Neuroinflammation** **2016**; 13:273 DOI 10.1186/s12974-016-0745-x.
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- Saraste M, Penttilä-T-L and Airas L. Natalizumab-treatment leads to an increase in circulating CXCR3-expressing B-cells. Accepted to **Neurol Neuroimmunol Neuroinflamm** 2016.

**Number of PhD degrees completed during 2010-2016: 5**

**External funding in 2015-2016:** Academy of Finland; State research funding (EVO); Orion Farnos Foundation; The Finnish Medical Foundation; Tyks Foundation; Faculty of Medicine, University of Turku; Sigrid Juselius Foundation; MerckSerono; Novartis Pharma; Biogen Idec; Roche.