

SysmedIBD



Who are the Members of SysmedIBD?

- University of Manchester (*UK*)
- Christian-Albrechts-Universität zu Kiel (*Germany*)
- Deutsches Krebsforschungszentrum Heidelberg (*Germany*)
- University of Warwick (*UK*)
- Universitätsklinikum Aachen (*Germany*)
- University of Liverpool (*UK*)
- Maastricht Universitair Medisch Centrum (*The Netherlands*)
- Hebrew University of Jerusalem (*Israel*)
- LifeGlimmer GmbH (*Germany*)
- GeneXplain GmbH (*Germany*)
- University of Auckland (*New Zealand*)
- GABO:mi Gesellschaft für Ablauforganisation :milliarium mbH & Co. KG (*Germany*)

How Can You Get in Contact with SysmedIBD?

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SysmedIBD

Systems Medicine of
 Chronic Inflammatory
 Bowel Disease



What Is Systems Medicine?

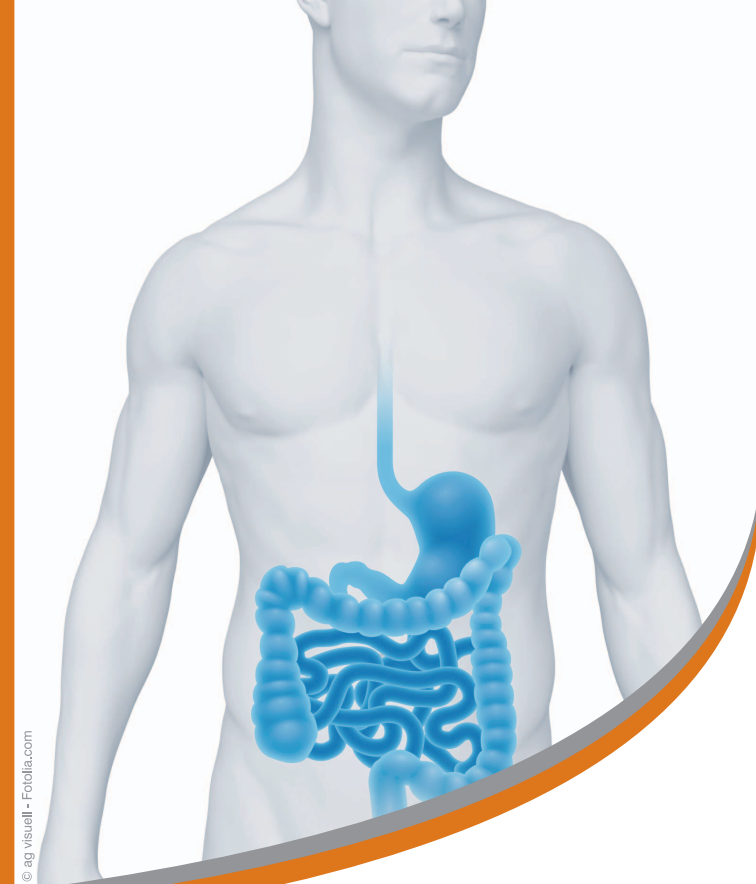
In Biology, detailed mathematical models of complex biological processes were developed based on extensive experimental data. In systems medicine, such models will be applied and further developed to target particular diseases. The aim is to understand disease mechanism, to better develop new biomarkers, to stratify patients and to suggest personalised treatments. The patients' diagnosis will be much more detailed compared to conventional approaches and co-morbidities are better taken into account.

What Is Inflammatory Bowel Disease?

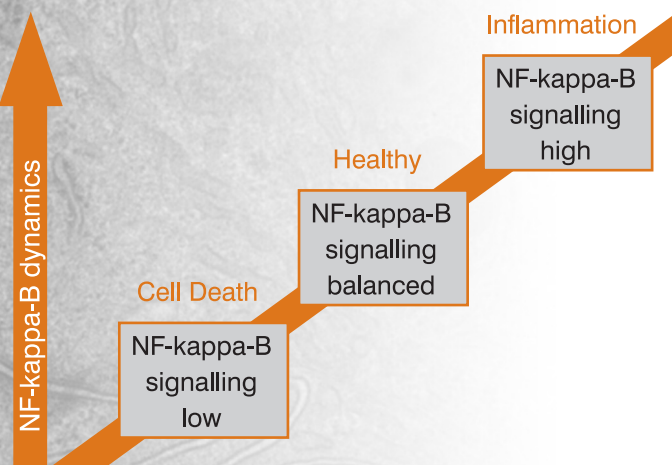
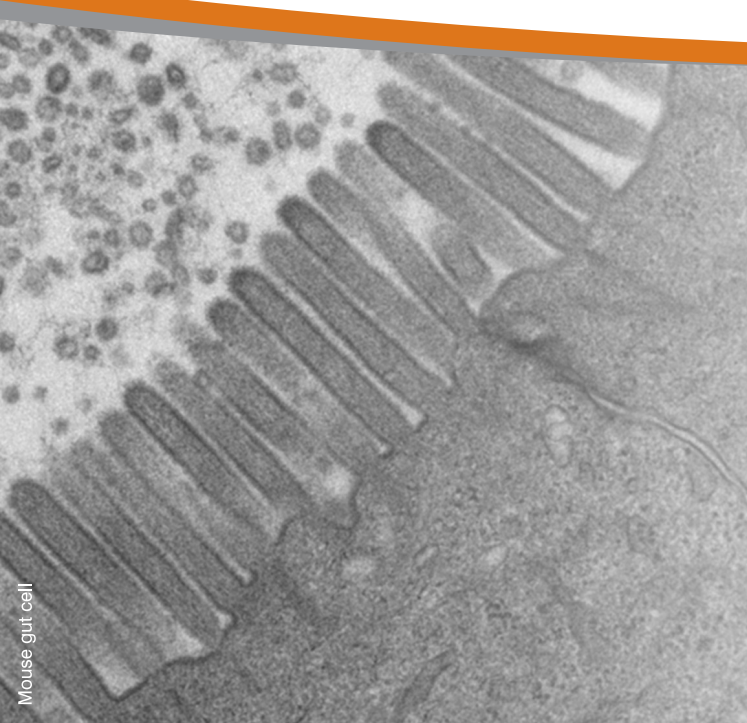
Inflammatory Bowel Disease is chronic inflammation of the gut. Two such diseases are ulcerative colitis and Crohn's disease. In Europe about 10 in 100,000 people suffer from ulcerative colitis and about 5 in 100,000 people from Crohn's disease. The disease can start at an early age. The disease cannot be cured and lifelong management of the disease is required. A systems medicine approach, including as much data as can be collected and incorporated into mathematical models, will allow the general practitioner, the specialist and the patient to better stratify and manage the disease.

What Is the Role of the NF-kB Pathway in Inflammation?

The NF-kB pathway consists of protein complexes found in the cytoplasm and the cell nucleus. Members of the protein complexes migrate between the cytoplasm and the nucleus and vice versa. The NF-kB signalling pathway was initially identified by the group of Baltimore as a crucial part of the development of antibody producing cells. Now we know that the NF-kB signalling pathway is essential for many cell functions and is upregulated in cells during inflammation. Mike White, when in Liverpool, was the first to describe that the NF-kB is a very dynamic signalling pathway that can be well described in mathematical models. Within SysmedIBD we will study the dynamics of the NF-kB pathway in patients with chronic inflammatory bowel disease.



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What Is the Aim of SysmedIBD?

SysmedIBD has several partners working towards a systems medicine approach of Inflammatory Bowel Disease. Mathematical experts develop models describing the process of chronic inflammation starting with one central pathway present in each cell type, the NF-kB pathway. Biologists with expertise in animal models will generate data to validate the mathematical models, and samples from patients will be used to match experimental data to patient cohorts. Within the consortium, specialists in chemical computing will suggest potential drugs to treat chronic inflammation, and experts in nutrition will follow the outcome of diet intervention of patients with Inflammatory Bowel Disease.

Key Data

Start date: 01/12/2012 - Project duration: 5 years
EC funding: 11.999.998 Euro

Mouse gut cell