Two transregios at FAU awarded further funding

Two transregios at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) have had their funding extended: the collaborative research center/transregio 154 “Mathematical modeling, simulation and optimization using the example of gas networks” is entering into its third funding period, whilst the CRC/transregio 241 “Immune-epithelial communication in inflammatory bowel diseases” has had its funding extended for the first time.

Inflammatory bowel disease
Inflammatory bowel diseases (IBD, Crohn’s disease and ulcerative colitis) are characterized by a destructive and progressive inflammation of the intestinal lining. There is still no cure, but the number of people affected by the disease is on the rise. In order to be able to develop new treatments, doctors and researchers must first gain a better understanding of what triggers the disease. This is the objective behind transregio 241 “Immune-epithelial communication in inflammatory bowel diseases”.

In the first funding period, researchers were able to show that intestinal flora, the intestinal barrier and immune cells in the intestines form a regulatory circuit, and that any malfunctions in the system can have a major effect on IBD. In addition, they also developed innovative approaches for treating and diagnosing the disease in order to pinpoint and correct any malfunctions causing symptoms in patients. These approaches are currently undergoing clinical trials.

Molecular and cellular factors have already been identified, and during the next funding period the researchers aim to use model systems to explore their significance in triggering IBD. By influencing each of these factors, the team will explore how these new findings can be incorporated into treatments. Any promising experimental approaches will be carried over into further clinical studies.

Detailed information about CRC/transregio 241 is available in this press release on its launch.

Gas networks for the future
Germany is pursuing the goal of switching over to renewable sources of energy in the near future. For this to happen, it is not only necessary to extend and convert existing infrastructure, but also to modernize methods for operating and controlling energy networks. The gas network is of particular importance. For (geo)political, security and supply engineering reasons, gas will continue to play a major role for some time to come. One reason is that the future hydrogen infrastructure will use and extend existing capacities in the gas network.

Findings in the context of mathematic modeling, simulation and optimization and how they relate to each other are crucial if we are to answer the questions that will arise as a result. This is the focus of the collaborative research center/transregio 154 “Mathematical modeling, simulation and optimization using the example of gas networks”, with its work ranging from research into basic theory to how findings can be transferred into practical applications. In the last funding period, the focus was predominantly on dynamic aspects, dealing with uncertainty and interrelation with the gas trade.
In its third funding period, the researchers will continue to develop the methods and models they have developed to date and link them to the current challenges posed by the energy transition using the mathematical skills they have developed.

Detailed information is also available on the website of CRC/transregio 154.

wissenschaftliche Ansprechpartner:
CRC/Transregio 241 ‘Immune-epithelial communication in inflammatory bowel diseases’
Prof. Dr. Christoph Becker
Department of Medicine 1– Gastroenterology, Pneumology and Endocrinology
Phone: +49 9131 85 35886
christoph.becker@uk-erlangen.de

CRC/Transregio 154 “Mathematical modelling, simulation and optimization using the example of gas networks”
Prof. Dr. Alexander Martin
Chair of Analytics and Mixed-Integer Optimization
Phone: +49 9131 85 67163
alexander.martin@fau.de