

Centre for Individualised Infection Medicine

A joint initiative of

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Centre for Infection Research

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CIIM: IMPLEMENTING INNOVATION

Infections and their sequelae are still responsible for every fifth death worldwide. New emerging and recurring pathogens, chronic infections, but also increasing resistance to approved drugs pose new challenges for physicians. The CiiM team is working on the vision of adapting and optimizing the treatment of patients with infectious diseases to the specific needs and requirements of each individual patient.

To achieve this, the CiiM is dedicated to exploring individual characteristics and their impact on susceptibility to infections or treatment success of available therapies. Through combination of different areas of expertise, the CiiM creates a new interdisciplinarity, which enables the required systematic workflow and promises innovation.



STUDY PARTICIPANT CiiM physicians care for patients with infectious diseases in the clinic and request their consent to participate in specific CiiM studies, if eligible.



MOLECULAR DIAGNOSTICS Depending on the study, certain biosamples will be processed at the CiiM for molecular diagnostics and characterisation of the patients and the causative agents. In parallel, the (further) development of diagnostic methods is pursued.



DATA PROCESSING The CiiM data specialists link this new molecular diagnostics with the existing clinical data and create correlations with the help of bioinformatics methods.



DATA ANALYSIS In a next step, computer models are created using mathematical methods and simulations. For example, such models provide evidence for biomarkers or relationships that allow stratification of individuals with regard to their risk profile or recommended treatment.



EXPERIMENTAL VALIDATION CiiM scientists experimentally verify these computer-based hypotheses on model systems, and explore the underlying mechanisms in collaboration with HZI, MHH and TWINCORE.



STRATIFICATION CRITERIA After successful experimental confirmation e.g. of a newly discovered biomarker, the CiiM team quickly translates the insights into new patient classification criteria and tailored treatment recommendations.



INDIVIDUAL THERAPY For certain patient groups, the CiiM team will work closely with the clinic to explore new therapeutic options.



CLINICAL VALIDATION In collaboration with clinicians at the university hospital, the CiiM team validates the evidence gained in the previous steps in clinical trials.



TRANSFER TO THE CLINIC Publication of the study results by the CiiM team ensures an adaptation of the treatment recommendations and guidelines. At the MHH, the CiiM physicians implement those in case reviews via the Centre for Infectious Diseases, which has been certified by the German Society of Infectious Diseases (DGI).



CiiM

CENTRE FOR INDIVIDUALISED
INFECTION MEDICINE

TREATING INFECTIONS INDIVIDUALLY

The CiiM researches and develops individualised approaches for the prevention, diagnosis and treatment of infections for the benefit of the individual patient.

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INDIVIDUALISED MEDICINE

Medicine has always endeavoured to capture the particularities of each individual patient to enable treatment in the best possible and individual way. However, in recent years, it has become increasingly clear that the molecular profile of each patient, meaning the molecular and cellular equipment, which depends on the genes and other influences, largely impacts the success of a treatment.

The emerging field of individualised medicine, also referred to as personalised or precision medicine, would like to use this knowledge for the benefit of the patient and derive the best possible treatment based on scientifically evident markers:

INDIVIDUAL RISK ASSESSMENT

Molecular characterisation to determine the predisposition for a disease

TARGETED PREVENTION

Individually determined behaviour / lifestyle adaptation or therapeutic prophylaxis to prevent the development or progression of a disease

SPECIFIC DIAGNOSIS

Earliest possible diagnosis of a disease through molecular diagnostics and deduction of individual treatment strategies

TAILORED TREATMENT

Improved success rate through customised, targeted therapy with fewer side effects

INDIVIDUAL PATIENT MANAGEMENT

Active monitoring of disease progression and treatment success

Individual characteristics of each patient, including the microorganisms colonising the body, the so-called microbiome, determine the susceptibility to infections and the severity of the infection process

The pathogens themselves can develop specific characteristics, such as resistance, that the chosen therapy has to consider

The effectiveness of drugs and therapies depends on individual parameters of the patient, his microbiome, the pathogens and the reciprocal dynamic interaction

PARTICULARITY OF INDIVIDUALISED INFECTION MEDICINE



The Centre for Individualised Infection Medicine (CiiM) is a joint initiative of the Helmholtz Centre for Infection Research (HZI) in Braunschweig and the Hannover Medical School (MHH).

CiiM research activities will explore the impact of individual patient and pathogen particularities on susceptibility to infection, disease progression and therapeutic outcome. An optimised individual care of patients is the long-term goal.

Realisation of this vision requires an interdisciplinary, patient-oriented pooling of expertise from different areas of the clinic and research. The construction of a dedicated CiiM building with federal investment by the Helmholtz Association and the State of Lower Saxony in the immediate vicinity of the MHH and the other research facilities of the biomedical campus Hannover will be a key development. It will also be a focal point for future investment and industrial cooperation.

CIIM COOPERATION PARTNER

Embedding the CiiM in regional, national and international infection research will support the development of innovative and high-quality solutions in individualised infection medicine. Therefore, the CiiM seeks to be closely associated with various research institutions and networks, as well as initiatives in personalised medicine and related fields such as data science. These include, among others

