

# New Approaches to Combat Antibiotic-Resistant Bacteria

## AntiResist

### National Centre of Competence in Research

#### Brief overview

Antibiotics are essential in treating bacterial infectious diseases such as blood poisoning and pneumonia. They also play a vital role in many other areas of modern medicine, protecting patients whose immune system has been weakened, perhaps as a result of cancer treatment, an organ transplant or surgical intervention. But these achievements of modern medicine are now under threat. More and more strains of bacteria are becoming resistant to one or several types of antibiotics. Infections involving multi-resistant bacteria can no longer be treated, or only with great difficulty. Neither is the research and development community currently able to meet the urgent demand for new effective antibiotics, one reason being that research has historically been conducted into bacteria primarily under artificial laboratory conditions. In a patient's body, however, the conditions are entirely different and so bacteria can behave quite differently. We still have very little understanding of these processes.

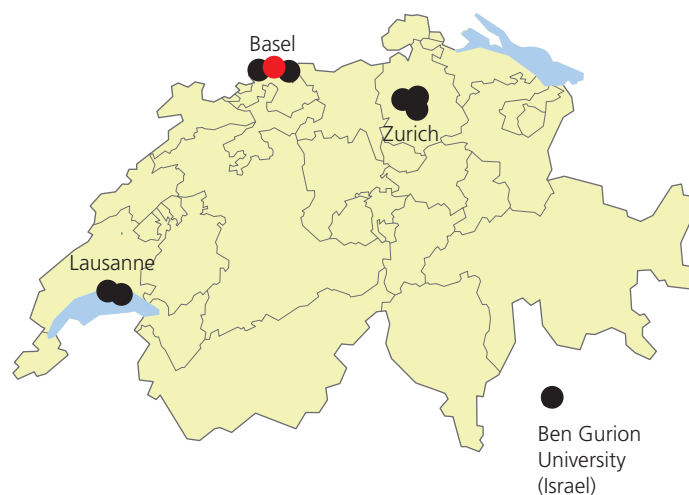
The AntiResist National Centre of Competence in Research (NCCR) is developing new approaches in order to better understand the biochemical and biophysical processes caused by bacterial pathogens in infected patients, and to simulate them in tissue modelling. The findings will help researchers to develop new antibiotics more rapidly, and to identify new and innovative antimicrobial effect mechanisms on the basis of which new medicines can be developed. The research will focus on four pathogens that cause major problems throughout the world. The NCCR's overriding objective is to initiate a paradigm change in infection research by adopting an interdisciplinary approach that brings together research groups from the fields of clinical research, biology, chemistry, engineering and pharmacology.

The AntiResist NCCR's home institution is the University of Basel (seven research groups at the University of Basel and four at the Basel University Hospital are involved). The national network also includes three research groups at the ETH Zurich and three at the ETH Zurich's Department of Biosystems Science and Engineering in Basel, three at the EPF Lausanne, and one each at the University of Zurich, the Zurich University Hospital, the University of Lausanne and the Ben Gurion University in Israel.

Further information  
<http://antiresist.unibas.ch>  
[www.sbf.admin.ch/nccr-e](http://www.sbf.admin.ch/nccr-e)

#### Facts and figures

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**Home institution** ●  
**(number of groups)**  
University of Basel (7)

**Network**  
**(number of groups)**  
Basel University Hospital (4)  
ETH Zurich (3)  
ETH Zurich, Basel site (3)  
EPF Lausanne (3)  
University of Lausanne (1)  
University of Zurich (1)  
University Hospital Zurich (1)  
Ben Gurion University, Israel (1)