



## LABORATORY OF CYSTIC FIBROSIS PATHOGENESIS

### OFFER

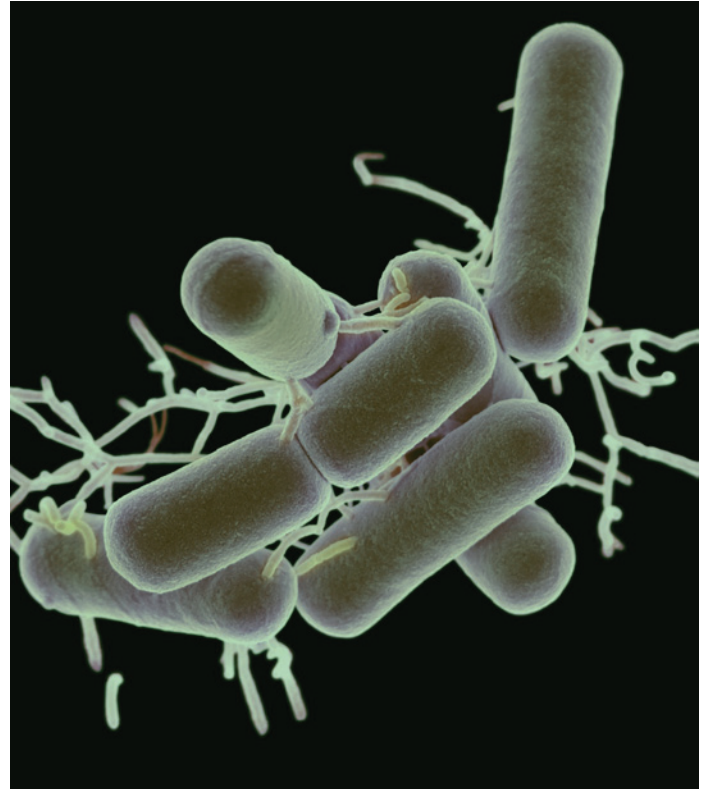
We can provide basic services in a general field of an antigen selection and immunogen preparation:

- *Pseudomonas aeruginosa* adherence assay using fluorescence labeled bacteria and lung epithelium cells.
- The effect of prophylactic IgY against virulence factors of *P. aeruginosa* and *B. cepacia* complex can be examined.
- We also provide molecular techniques, such as mRNA synthesis or cell transfection.
- Currently, the mouse CF lung model is being developed.

„Our goal is the development of an effective antibody prophylaxis of CF patients preventing their infections caused by *P. aeruginosa* and *B. cepacia* complex as well as the restoration of CFTR via administration of a stable mRNA. “

### KNOW-HOW & TECHNOLOGIES

- Antigen selection and immunogen preparation: computer design of peptide antigens, peptide conjugation to carrier, purification of egg yolk antibody and its affinity purification (using our patent procedure)
- Animal treatment: aerosol inhalation (PARI nebulizer), intratracheal instillation (mouse)
- cell culture handling: lung epithelium cell cultures (CuFi and NuLi) cultivation, cell transfection
- Developed assay: bacterial adherence assay using fluorescence labeled bacteria and lung epithelium cells – this procedure is currently employed in the development of antibacterial antibody prophylaxis
- Assays we used: ELISA, Western blotting, immunostaining with fluorescence microscopy, microplate ion efflux assay, luminescence determination (Tecan Infinite M200 Pro),
- Design of stable mRNA and its synthesis



## CONTENT OF RESEARCH

- Administration of egg yolk antibody against virulence factors of bacteria as an excellent tool of prophylaxis of microbial infections that can prevent damage of lung epithelium of cystic fibrosis patients.
- Transfection of epithelial cells with synthesized stable CFTR mRNA that could restore CF airway function. The restoration of CF airway function is tested using a chloride ion channel activity determined by fluorescent microplate assay.

## KEY RESEARCH EQUIPMENT

- Spectrofluorometer (Tecan Infinite M200 Pro)
- Ultracentrifuge Optima XPN (Beckman Coulter)
- ELISA reader Sunrise (Tecan)
- Hydro Flex ELISA (Tecan)
- Microscop Nikon ECLIPSE TE2002-U (with IS-Elements AR 2.30 software)

## PARTNERSHIPS & COLLABORATIONS

### ACADEMIC PARTNERS

Department of Pathology, 3rd Faculty of Medicine, Charles University | Department of Medical Microbiology, 2nd Faculty of Medicine, Charles University and University Hospital Motol | Department of Biochemistry, Faculty of Science, Masaryk University

### PRIVATE AND PUBLIC SECTOR

National Institute of Public Health in Prague | Institute for Clinical and Experimental Medicine (IKEM), Prague | Center for Cystic Fibrosis Patients, z.s.

## MAIN PROJECTS

Coordinator of grants from the Grant Agency of Czech Republic: Centre of drug-dietary supplements interactions and nutrigenetics (GA CR P303/12/G163) and Grant Agency of Charles University (GA UK 1584814); collaborator of 16 grant projects from GA CR, 4 grants of the Grant Agency for Development of Universities and 3 grants GA UK.

## ACHIEVEMENTS

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