

# Cystic Fibrosis Research News

## Title:

**IgG avidity to *Pseudomonas aeruginosa* over the course of chronic lung biofilm infection in cystic fibrosis**

## Authors:

**Renan Marrichi Mauch<sup>1</sup>, Lena Lingren Nørregaard<sup>2,3</sup>, Oana Ciofu<sup>4</sup>, Carlos Emilio Levy<sup>1,5</sup>, Niels Høiby<sup>2,6</sup>**

## Affiliations:

<sup>1</sup>Department of Clinical Pathology, School of Medical Sciences, University of Campinas

<sup>2</sup>Department of Clinical Microbiology, Rigshospitalet (Copenhagen University Hospital),

<sup>3</sup>University of Copenhagen.

<sup>4</sup>Department of International Health, Immunology and Microbiology, Faculty of Health and Medical Sciences, Panum Institute, University of Copenhagen.

<sup>5</sup>Laboratory of Microbiology, Division of Clinical Pathology, Hospital de Clínicas (Campinas University Hospital)

<sup>6</sup>Department of International Health, Immunology and Microbiology, Faculty

## What was your research question?

While the antibody response to bacteria is intense, it still may not be efficient enough to clear *Pseudomonas* infection from CF airways. We asked whether the ability of antibodies specific for *Pseudomonas* to recognise the bacteria changes over the course of chronic *Pseudomonas* lung infection in CF.

## Why is this important?

The body's main defence against *Pseudomonas* is the IgG antibody. Yet the functional mechanisms of why this does not work in CF are poorly understood. Studying this may help to clarify why the antibody response is not showing appropriate immune effectiveness against *Pseudomonas* infection in individuals with CF.

## What did you do?

We assessed serum samples from 10 patients seen at the Copenhagen CF Reference, in Denmark, who developed chronic *Pseudomonas* lung infection. These samples were dated from two years prior to the onset of chronic infection until two years after positive culture results. To determine the functionality of anti-*Pseudomonas* IgG antibody, we measured how strongly the antibodies interacted against different antigens (structures of the bacterial

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cell) of *Pseudomonas*. These results were compared against those from a group of 10 patients, who had occasional but not chronic *Pseudomonas* colonization over 5 years.

## What did you find?

The ability of antibody IgG to bind *Pseudomonas* alginate, the main component of the biofilm-producing mucoid *Pseudomonas*, did not increase either in the onset of chronic infection or two years post onset. During this period, there is a high and repeated exposure to this antigen. Similarly, antibodies in patients with occasional colonization did not increase to alginate either.

## What does this mean and reasons for caution?

IgG is the main antibody involved in the inflammatory response, attracting neutrophils of the immune system to the infection site. Neutrophils are the main actors in bacteria capture and destruction. The low binding ability of IgG in CF airways may reflect flaws in antibody production by B-lymphocytes in CF and possibly play a role in the poor immune response against *Pseudomonas*.

## What's next?

Experiments evaluating the capacity of opsonization (marking of the bacteria for later elimination) of these IgG antibodies against non-mucoid and mucoid *Pseudomonas* strains will be performed to better understand our findings.

## Original manuscript citation in PubMed

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