

# Cystic Fibrosis Research News

## Title:

**TRIAZOLE RESISTANCE IN *ASPERGILLUS FUMIGATUS* ISOLATES FROM PATIENTS WITH CYSTIC FIBROSIS IN ITALY**

## Authors:

Anna Prigitano<sup>a</sup>, Maria Carmela Esposto<sup>a</sup>, Arianna Biffi<sup>b</sup>, Gabriella De Lorenzis<sup>c</sup>, Vincenza Favuzzi<sup>d</sup>, Raffaella Koncan<sup>e</sup>, Giuliana Lo Cascio<sup>f</sup>, Marisol Barao Ocampo<sup>g</sup>, Carla Colombo<sup>h</sup>, Giovanna Pizzamiglio<sup>i</sup>, Luisa Romanò<sup>a</sup>, Anna Maria Tortorano<sup>a</sup>

## Affiliations:

<sup>a</sup>Department of Biomedical Sciences for Health, Università degli Studi di Milano, Milano, Italy -Via Pascal 36 - 20133 Milano, Italy

<sup>b</sup>Cystic Fibrosis Microbiology Laboratory and Cystic Fibrosis Center, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico Milano, Italy -Via Francesco Sforza 35 - 20122 Milano Italy

<sup>c</sup>Department of Agricultural and Environmental Sciences - Production, Landscape, Agroenergy, Università degli Studi di Milano, Milano, Italy - Via Celoria 2 – 20133 Milano, Italy

<sup>d</sup>Pathological Anatomy Unit, Department of Diagnostic and Public Health, Università di Verona, Verona, Italy- Policlinico G.B. Rossi - P.le L.A. Scuro 10 - 37134 Verona, Italy

<sup>e</sup>Microbiology and Virology Unit, Department of Diagnostic and Public Health, Università di Verona, Verona, Italy- Policlinico G.B. Rossi - P.le L.A. Scuro 10 - 37134 Verona, Italy

<sup>f</sup>Microbiology and Virology Operating Unit, Department of Pathology and Diagnostic, Azienda Ospedaliera Universitaria Integrata, Verona, Italy- Policlinico G.B. Rossi - P.le L.A. Scuro 10 -37134 Verona, Italy

<sup>g</sup>Cystic Fibrosis Center, Azienda Ospedaliera Universitaria Integrata, Verona, Italy – Policlinico G.B. Rossi - P.le L.A. Scuro 10 - 37134 Verona, Italy

<sup>h</sup>Cystic Fibrosis Center, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico Milano, Università degli Studi di Milano, Milano, Italy -Via Francesco Sforza 35 - 20122 Milano Italy

<sup>i</sup>Respiratory Disease Department, Cystic Fibrosis Center Adult Section, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico Milano, Italy -Via Francesco Sforza 35 - 20122 Milano Italy

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## What was your research question?

How common is azole (a type of antifungal medication) resistance in the fungus, *Aspergillus fumigatus* isolated from the lungs of people with cystic fibrosis (CF)? Is this phenomenon related to azole use in agriculture?

## Why is this important?

*Aspergillus fumigatus* is the predominant fungus recovered from respiratory secretions (e.g. sputum) of people with CF. Fungal growth may lead to a worsening of respiratory symptoms and, sometimes, it is complicated by an allergic reaction in the lungs called allergic bronchopulmonary aspergillosis. Invasive aspergillosis, where the fungus can spread to the entire lung and the other organs in the body, has been rarely reported. Azole antifungal medications (including itraconazole and voriconazole) which are taken orally, are the cornerstone in the treatment of aspergillosis. However, in the last decade, azole resistance has been increasingly reported and is probably a result of long-term azole therapy and widespread use of azole fungicides in agriculture.

## What did you do?

We studied how common azole resistance was in *Aspergillus fumigatus* from patients receiving treatment at two cystic fibrosis centres of northern Italy.

## What did you find?

In one centre, no azole resistance was detected in *Aspergillus fumigatus*, while 8% of patients of the other centre had resistant fungi (this level of azole resistance has also been observed in other European centres). In our patients an environmental origin of azole resistance seems probable since resistant fungi were found in patients, who had not received an azole treatment. In addition, resistance in seven out of eight patients was linked to changes in the fungal DNA that are considered to be a consequence of exposure to azole fungicides used in agriculture. We also found that fungi from some patients had the same genetic make-up as fungi from the environment.

## What does this mean and reasons for caution?

Testing of *Aspergillus fumigatus* for azole resistance should be performed in patients requiring antifungal treatment, even if the person has never been treated with an azole in the past, and particularly in patients for whom a lung or liver transplant is planned.



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## **What's next?**

The possible selection of resistant fungal pathogens in the environment should lead to cautious application of azoles in agriculture.

## **Original manuscript citation in PubMed**

<http://www.ncbi.nlm.nih.gov/pubmed/?term=TRIAZOLE+RESISTANCE+IN+ASPERGILLUS+FUMIGATUS+ISOLATES+FROM+PATIENTS+WITH+CYSTIC+FIBROSIS+IN+ITALY>

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[cfresearchnews@gmail.com](mailto:cfresearchnews@gmail.com)