

AirInSpace is teaming with leading hospitals such as Dijon University Hospital to make air quality safer for immunocompromised patients.

State-of-the-Art, Mobile Infection Control

ASPERGILLUS is a genus of some 200, highly airborne molds, some of which can be deadly, especially to immunocompromised hospital patients. Consider: incidence rates of invasive *aspergillosis* have been reported as high as 26% in allogenic bone marrow transplant patients and 25% in acute leukemia patients. And in these immunocompromised patients who are infected by airborne aspergillosis spores, the scientific literature reports that death occurs in as many as nine out of 10 of these patients.

"In a hospital setting, construction work that liberates large amounts of *Aspergillus* spores is the major source of nosocomial aspergillosis," says Dr. Ludwig Aho-Glélé, who heads the Hospital Hygiene and Epidemiology Unit at Dijon (France) Hospital. "Given that we were about to commence a major, long-term construction project right next door to high-risk clinical units such as our adult and pediatric hematology wards, we needed to be extra diligent in preventing liberation of these spores that are the source of potentially lethal nosocomial aspergillosis."

Traditional mechanical high efficiency particulate arrestance (HEPA) air filtration, with or without laminar airflow ventilation, does reduce airborne fungal contamination and the incidence of invasive aspergillosis in a hospital setting. But the cost often precludes large-scale utilization.



Dr. Denis Caillot
Chief of Service, Dept. of Haematology, Dijon Hospital, Dijon, France; Co-author: "Reduced fungal contamination of the indoor environment with the Plasmair system (AirInSpace)", *Jml of Hospital Infection* (2007) 65, 156-162.



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"Fungal spores are a major source of nosocomial aspergillosis. We have significantly reduced fungal contamination in our adult and paediatric units since introducing Plasmair."

"Our data show that the Plasmair mobile units are providing an efficient method of reducing indoor fungal contamination, which can be lethal to immunocompromised patients."



Dr. Denis Caillot, head of Clinical Haematology, turned to AirInSpace, which owns a patented core technology, HEPA-MD™—the next generation of its initial Plasmer™ platform—that inactivates lethal airborne microorganisms. Developed initially for use in Russia's MIR space station, the AirInSpace technology is in routine use today on the International Space Station (ISS). AirInSpace owns exclusive rights to this one-of-a-kind technology, which shows up to 99.999% single-pass inactivation of airborne microorganisms.

ON THE RECORD

Under the guidance of Dr. Denis Caillot and Dr. Ludwig Aho-Glélé, Dijon Hospital conducted a 13-month pre-construction study to determine if the AirInSpace Plasmair mobile unit could indeed reduce the incidence of indoor fungal contamination in high-risk hospital rooms. Results of the study ("The use of Plasmair air-decontamination units for the prevention of invasive pulmonary *aspergillosis* in neutropenic patients") were published in the *Journal of Hospital Infection* (2007: 65, 156-162).

"Our study found that the mobile Plasmair units may provide a new approach to air-treatment in the hospital setting," explains Dr. Aho-Glélé. "Plasmair units were effective in reducing fungal contamination in both the adult and pediatric haematology units over a long period of time."

"My job, of course, is to prevent nosocomial infection in the hospital. We found that Plasmair is an effective device that reduced contamination by aspergillosis. Therefore we can now say that our hospital is safer as a direct result of using the AirInSpace Plasmair device. It is effective, and it is mobile, so we can place it wherever we want in the hospital. In fact we have 40 units here throughout Dijon Hospital," says Dr. Aho-Glélé.

UNRIVALED TECHNOLOGY

AirInSpace's flagship product is the mobile air-decontamination called unit *Plasmair*. Its performance has been clinically proven to rapidly lower airborne biological loads and is now being used to combat nosocomial (hospital-acquired) infection to protect patients, staff and products in high-risk areas of more than 100 hospitals and clinics throughout France, including hematology wards, ICUs, and operating theaters. The outstanding inactivation and germicidal effects of the technology have been proven even against some of the world's most resistant microorganisms.

Traditional mechanical HEPA (High Efficiency Particulate Arrestance) filters are the most common airborne decontamination method used in hospitals, *but they don't inactivate the pathogens they trap* and can serve as a reservoir that promotes their growth, leading to more pathogens released into the air to pose a lethal risk to patients, staff and maintenance personnel. New regulations are being imposed to control airborne contamination levels, requiring hospitals to undertake massive renovations to upgrade their ventilation systems. Alternatively, hospitals are finding unprecedented success with deployment of *Plasmair* units.

OTHER HOSPITALS, SIMILAR SUCCESS

A second clinical study ("Evaluation of a new mobile system for protecting immune-suppressed patients against airborne contamination") published in the *American Journal of Infection Control* concluded that "...the (AirInSpace) unit can be used to quickly convert standard hospital rooms into areas that can host immune-suppressed patients without the need for major building renovations. Furthermore, destruction of the microorganisms within the (AirInSpace) unit also eliminates the risk posed by mechanical HEPA filter systems



Laurent Fullana
CEO, AirInSpace S.A.S.
Montigny Le Bretonneux,
France

"The cost of one *Plasmair* unit is less than the total cost to the hospital of a single nosocomial infection, taking into account additional days in the hospital, antifungal treatment, and potential litigation costs."



Wade Tetsuka
President, U.S. Operations
AirInSpace (Sterling, VA)

"The healthcare industry is making a full-fledged assault upon combating infections in acute care hospitals. AirInSpace has put a high-tech tool into the hands of hospitals for effectively and safely managing their air quality to help protect patients from airborne pathogens."

WHY PLASMAIR?

- Inactivates airborne particles from air
- No room renovation required
- Infrequent filter changes required
- Low noise and heat generation
- 'Plug and play' user-friendly



The mobile *Plasmair* unit (above, left) is used to remove/inactivate airborne particles from the rooms of neutropenic cancer patients at Dijon Hospital.



Dr. Vance Bergeron
Chief Scientific Officer
AirInSpace

"Hospital-acquired infections affect one in 10 patients. New regulations to control airborne contamination require hospitals to undertake massive renovations to upgrade their ventilation systems. Alternatively hospitals are finding unprecedented success with deployment of *PlasmairT2006* mobile units."

***PlasmairT2006* is the only such system cleared by the U.S. FDA as a 'medical device', differentiating it substantially from mere 'air cleaning' products marketed to hospitals.**

concerning the growth and release of airborne microorganisms." The study's investigation sites included two Paris sites—Hôpital Saint-Antoine and Hôpital Necker; and Centre Hospitalier Universitaire de Rennes, (France).

"Invasive aspergillosis is an *extremely* deadly nosocomial infection for immune-suppressed hospital patients. The U.S. Centers for Disease Control and

Prevention (CDC) reports a mortality rate of 95% in immune-suppressed patients who receive allogeneic bone marrow transplants and patients with aplastic anemia," says Laurent Fullana, CEO, AirInSpace. "These patients need a *highly* protective environment. The Dijon study demonstrates that our mobile system can effectively contribute to protect these patients. It's important to note that the *PlasmairT2006* has been cleared as a **class II medical device**. This means assurance of effectiveness and safety based on a thorough risk analysis in the design phase, good manufacturing practices, validated labeling and claims filed with the FDA, and post-market surveillance—all of which are not required and there-

fore typically not done for most appliances used as air purifiers."

"Providing immunocompromised patients with protection against airborne contamination used to require expensive and high-maintenance facilities. The Dijon study demonstrates that we can offer hospitals a self-contained mobile unit as a cost-effective alternative for establishing an unthreatened environment," adds Vance Bergeron, Ph.D., Chief Scientific Officer for AirInSpace.

"I am always *very* concerned about nosocomial infection," concludes Dr. Aho-Glélé. "Under rigorous testing, *Plasmair* has proven to me that we are doing everything we can by incorporating *Plasmair* into our standard infection control protocol." ■