

Spray 'n forget

Antwerp firm's invisible bacteria keep the office clean while you sleep



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\ BIOORG.BE

It may sound hard to believe: You spray a substance all over a dirty room, and when you come back a few hours later, the dust on the floor and furniture is gone. The computer screens are squeaky clean, and the room smells like a lush forest on a spring morning. Did an army of tiny elves come and do the job for you?

Actually, that's not too far from the truth, as the spray contains a special type of bacteria that form complex, self-cleansing ecosystems, which eat up all the fine dust. It's similar, says the company that produces it, to the way trees filter polluted air.

The microbial substance and spraying technique were invented by BioOrg, based in Antwerp. Its goal is to revolutionise the market for cleaning products, with the introduction of a safe, biological substance that does the job of dangerous chemicals.

There are a lot of different types of bacteria occurring in nature. Most are benign, so you might not even notice their existence, but they serve important functions.

Some eat fine dust, others prefer to digest molecules from combustion engines. There are even microbes specialised in cleaning up specific allergens.

"That's how it all started," says Filip Willocx, who co-founded BioOrg in 2009. "First we looked for the right bacteria. We turned entire libraries



BioOrg co-founder Koen De Coster (left) explains how their products work

of microorganisms upside down and went on several field trips to forests in France, Switzerland, Sweden and Norway."

Business partner Koen De Coster was the one who came up with the idea of using microbes as an invisible cleaning army. They scoured the forests, specifically looking for areas that both looked beautiful and smelled good.

"In the end, we selected nine different bacterial strains," says Willocx, "which are all champions in digesting specific forms of pollution very rapidly."

To prove their technique works, Willocx and De Coster have been testing the cleaning product since January in a variety of Antwerp's provincial governmental buildings. The results, they

say, have been positive.

The fine dust is gone, even from hard-to-reach areas, and the fingerprint smudges on computers and other office equipment disappeared hours after being sprayed. The employees have also said they appreciate the fresh smell, and some even noted that their allergies improved. Should the cleaning staff be worried about their jobs? "Not at all," says Willocx. "Someone will still have to spray the bacterial mix, and there will always be dirt that has to be cleaned with a microfibre cloth."

The use of bacteria in cleaning is nothing new. Water treatment facilities have long used microbes to turn sewage into water that's safe to drink. "Our philosophy is that we're restoring the natural balance between humans and the environment," Willocx says. "We really have to stop poisoning the inside of our buildings and the outside world. That's why we only work with benign bacteria and not aggressive chemicals." Willocx admits that the idea of having microorganisms crawling all over your furniture sounds scary. "But then I tell them that the skin carries around one kilogram of bacteria, and their intestines even more," he says. "Or that the food they adore – cheese, salami, bread, wine and beer – is the result of a complex process that wouldn't be possible without the help of microorganisms."

WEEK IN INNOVATION

Childhood chemo linked to memory loss

Researchers at KU Leuven have determined that adults who underwent chemotherapy as children have decreased cognitive abilities and problems with short-term memory. The findings were published in the *Journal of the National Cancer Institute*. The researchers examined 31 young adults who had received chemotherapy as children on a number of psychological tests and compared their results with those of a control group. The results show that cognitive functions such as long-term memory and the ability to concentrate are largely unaffected. These skills had already developed before the treatment. However, the cancer treatment has an impact on several skills developed later on, including switching between tasks and remembering new information for a short period of time.

VIB first in Europe to use DNA printer

Flanders' life sciences research centre VIB is the first in Europe to install and use a DNA printer. The BioX 3200 System allows a biotech company or academic lab to create genes, genetic elements and molecular tools. VIB scientists will be able to use the system to design and clone genes to answer crucial questions as to their function in biological systems. Specific applications include protein production, antibody library generation and cell engineering. The BioX 3200, manufactured by California-based SGI-DNA, has been placed in the lab run by Thomas Jacobs in the VIB Center for Plant Systems Biology in Ghent.

Antwerp port tackles identity fraud

A pilot project has begun in the port of Antwerp that tackles the problem of identity fraud. The project uses "block-chain" technology adapted to the sector by Antwerp-based start-up T-Mining. When a container arrives in a port, it is collected from the terminal by a truck driver, whose identity is verified with a PIN code. However, these codes are transmitted via a number of parties, any of whom could copy it for possible misuse. T-Mining is working on a more secure solution using block-chain, a digital interaction system that does not need a trusted third-party and that allows digital information to be distributed but not copied. T-Mining also intends to introduce the technology in Singapore. \ DW

UZ Gent pioneers robotic kidney autotransplant

Surgeons at Ghent University Hospital (UZ Gent) have successfully overseen the first kidney autotransplant to be performed in Europe by an advanced surgical robot.

Kidney autotransplantation is a type of surgery that helps patients manage acute, long-term kidney pain. During the procedure, the kidney that is causing pain is removed, treated and implanted in a slightly different place, in the



© Courtesy UZ Gent

pelvis.

Robotic surgery is a method where surgeons control a robotic arm from a computer. According to

surgeons, the process allows much more precision in the procedure and reduces a patient's recovery time significantly.

"Normally, such an operation would involve an incision of up to 30 centimetres," said Dr Karel Decaestecker of UZ Gent. "By using the robot, only five keyhole incisions of less than one centimetre each are necessary, plus another of about six centimetres to replace the kidney."

Worldwide, the procedure has only been carried out a few times. The UZ Gent team has now performed three kidney autotransplants in quick succession.

All the procedures went smoothly, and the patients are doing well, according to the hospital. The patients can return home after just six days rather than the four to six weeks normally required.

\ Denzil Walton

Q&A

Simon Feys of nature conservancy organisation Natuurpunt explains the symptoms and causes of the Usutu virus that is killing off blackbirds across Flanders

How did last year's outbreak affect the blackbird population?

We noticed that something was wrong in Limburg when people started bringing sick and dead blackbirds to us and to the local bird care centre. We still don't know the exact extent of the die-off, but there are places in nearby Germany where the blackbird population took a big dive. Last year's outbreak was limited to Limburg, but the first cases this year came from Ghent and Antwerp, followed by Limburg a few days ago, so the virus is spreading.

Where does it come from?

The Usutu virus was discovered in Africa in the 1950s. Around 2000, the first cases were reported in Austria, followed by Germany and the Netherlands in 2011. So it was only a matter of time before it reached Flanders.

The virus is transmitted by mosquitoes, which reproduce more easily in hot and rainy weather. This summer has been particularly favourable to them, and more mosquitoes means a higher risk of infection. On top of that, the annual bird migration is about to kick off, exposing even more blackbirds to infection.



Why is the virus particularly dangerous to blackbirds?

We're not exactly sure why blackbirds are particularly vulnerable to Usutu. There is evidence that they develop some resistance to the virus, but that it weakens over time. Apart from blackbirds, there are some 90 other species predis-

posed to catching the virus. Most of them are birds, but bats have also died from it.

What are its symptoms?

The infected birds become lethargic and passive, and they have difficulty orienting themselves. They also lose weight, even though they may actually appear chubbier because they stop tending their plumage. Infected blackbirds often do not fly away when approached.

What should you do if you think you find an infected blackbird?

You can try catching the bird. The virus doesn't pose any risk to humans, but you should still wear gloves when trying to catch a bird. Then bring it to your local bird care centre. \ Interview by Toon Lambrechts