A sniper among shotguns

ELIGO BIOSCIENCE In the face of rising resistances, scientists around the world are racking their brains on how to keep bacterial pathogens in check. Eligo Bioscience has found the perfect tool in the genome editing technology CRISPR/Cas9. With it, they are creating ultraprecise antibiotics that will leave the human microbiome intact.

Perhaps it's true what they say and people who love their work don't need hobbies. "I do have an ant farm," says Xavier Duportet a little apologetically. "I've had one since I was little." Ants aside, the young synthetic biologist and entrepreneur spends a lot of time in the lab, in the office, on the road. And with success: only one year after its foundation, his company has accumulated an astounding amount of fame.

It all started in 2013 across the Atlantic: Duportet, then a PhD student at MIT and INRIA, and his colleague David Bikard from Rockefeller University tried to selectively eradicate bacteria with the help of the brand new CRISPR/Cas9 technology. Together with Timothy Lu, MIT professor for Biological Engineering, and Luciano Marraffini from Rockefeller Uni, they felt they had a solid foundation to spin off a company – back home in France.

To get initial funding, Duportet, the newly minted CEO, got creative and applied for awards and to competitions. A big chunk came from the 'Worldwide Innovation Challenge' which was launched in December 2013 by the French government. It netted Eligo an award, and €200,000 – enough to get the company off the ground. This year, Eligo has already raised €2m in seed investments from Seventure Partners, and another €400,000 from Business Angels. Investors seem happy to invest. "They can tell our vision has promise," Duportet assures.

XAVIER DUPORTET
Eligo Biosciences, CEO

? How are you going to change the world?

! *We are going to put a check on widespread diseases by finetuning the microbiome.*

Kill the bad, keep the good

Eligo's method employs the CRISPR/Cas9 technology that makes it very easy to identify and modify strands of DNA. It inserts a pair of "genomic scissors" into a bacteriophage capsid which acts as a transport vehicle. Inside the bacteria, the Eligobiotics (as they have been nicknamed) search out unique gene sequences and cut them up, effectively destroying the microbes. Thus, Eligobiotics can be highly specific. For example, they can find and destroy just the virulent or resistant strains, leaving the microbiome largely intact. A huge difference to customary antibiotics, which target bacteria indiscriminately and thus do long-time damage to the beneficial and harmful alike. "We are like snipers. If we kill the bad strains, the good strains can flourish."

And eligobiotics are not bent on killing, either. It is also possible to find bacteria that are a danger to human health and turn them into harmless variants. Currently, the company is developing two lead candidates in gut and skin applications. A stopover, nothing more. "In the long run, we want to churn out a drug a day based on the platform we are developing," Duportet stresses. "There would be countless applications for that technology. We could nip antibiotics resistance in the bud!"

Duportet is not the type to let grass grow under his feet. Parallel to Eligo, the scientist turned businessman runs Hello Tomorrow, a non-profit business accelerator for science start-ups, which he founded three years ago. Among other awards, the 27-year-old has won French Innovator of the Year by the MIT Technology Review. He has been portrayed in Le Monde and La Tribune. Has the fame gone to his head? "I don't think so," Duportet says with a grin. "Who has time for that?"

As far as he is concerned, Eligo still has a long way to go. Duportet's dream is to be able to hone the microbiome to perfection. "Research shows that many diseases are driven by the human microbiota. Just imagine what we could do if we could engineer microbiomes! We could change healthcare for good." ■

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ELIGO BIOSCIENCE

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Picture: Eligo Bioscience