startup

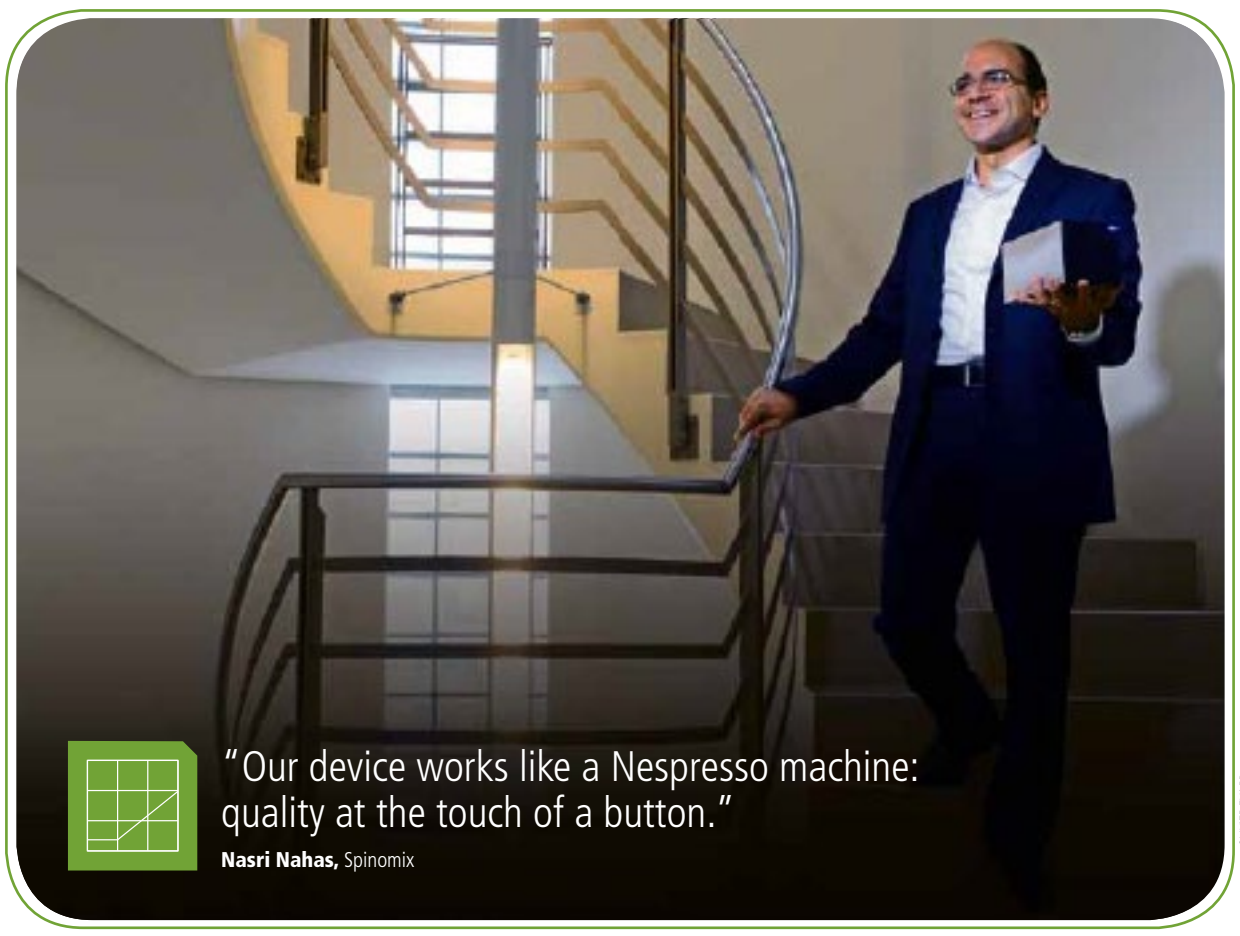
Automation on the laboratory bench

Spinomix Routine tests on blood, saliva or urine are very complex, with most of the time taken up by the preparation of the samples. A Lausanne-based start-up wants to change this.

LAURINA WALTERSPERGER

It's a laborious preparation process that requires a lot of time and staff. To enable medical laboratories to carry out a wide range of tests on samples of blood, saliva, urine, DNA or cells on a daily routine basis, target substances such as bacteria and viruses have to be obtained from the samples in a complex procedure. While the analysis in the laboratory is already largely automated, the preparation of the samples still involves a large amount of manual work.

A Lausanne-based start-up for research and diagnostics now wants to reduce the amount of work required. Spinomix, a company founded in 2005, has developed a device that automates preparatory work in a laboratory. "At the moment, 60 to 80 per cent of the work done by laboratories does not relate to the analysis, but to the preparation of the samples,» says Nasri Nahas, the head of Spinomix. He expects his company's technology to improve efficiency in laboratories. This efficiency could benefit the markets for diagnostics, DNA analysis, cell research and food safety, all of which are worth billions (see chart).



OLIVIER EVARD

In search of licensing partners

As well as the complex manual work involved in common preparation methods, Nahas, who has been CEO since the beginning of this year, says that current procedures also have problems detecting very small amounts of substances in heterogeneous samples. This is the case with prenatal DNA tests, for example. The genetic material of the foetus, which can provide information about possible chromosomal disorders, is present in the mother's blood only in very small quantities. This is where Spinomix says it has a strong competitive advantage. As Spinomix' device MagPhase works with 10 millilitres and thus an equivalent large quantity of blood or other test substances, it can filter more foetal DNA from the blood for examination in prenatal tests. Various tests have been already validated by Spinomix' field testers and partners, such as in the field of Chlamydia detection (sexually transmitted disease) at a private diagnostics laboratory in the Lausanne area. Nahas is now looking for the right strategic partners that have access to laboratories, with which Spinomix can collaborate in order to raise awareness of its brand on the market. «We are in advanced talks with a handful of partners regarding licensing agreements,» says Nahas. He expects to conclude the first deals early next year.

The latest prototype of the Spinomix device weighs a few kilograms, is 22 centimetres wide and can process four samples simultaneously. Nahas, a biologist, never misses an opportunity to compare his invention to a Nespresso machine: «It's handy, small and robust and always delivers the same quality at the touch of a button.» Spinomix spent eight years working on the development of the MagPhase system. The development costs totalled CHF 5.5 million. The company produces the prototypes that have been used so far in Nyon and has them assembled in the USA. This is not expected to change in future production.

Innovation in a plastic tube

In addition to the MagPhase application, Spinomix is working on a second process that allows bacteria, viruses or cells to be efficiently extracted from diagnostics samples. FibroTrap is the name given to the small plastic tube device that looks like conventional sample container but can do so much more. A short extension hangs from the inside of the cap, and the tube contains a lyophilized protein, fibrinogen. This protein plays a role in blood clotting in humans by catching platelets in its mesh-like spiral structure. Fibrinogen also performs this function with bacteria in Spinomix' tube – bacteria break away from the sample and accumulate on the extension of the cap, which means that they can be concentrated enormously and analysed immediately. "If there is a suspected blood infection, the doctor no longer has to perform a blood culture – he or she can analyse the filtered bacteria after one hour, make a diagnosis and administer appropriate antibiotics," says Nahas. FibroTrap tests are being conducted on Staphylococci and Chlamydia bacteria at Geneva University Hospital. Besides bacteria tests for use in medicine and the food industry, Nahas is planning for FibroTrap to capture viruses in the future.

Nahas is currently looking for new investors to invest between CHF 5 million to CHF 10 million in the further development and marketing of MagPhase and FibroTrap. With this funding and the licensing agreements, which are expected to be sealed in early 2015, the 43-year-old Frenchman hopes that Spinomix will reach profitability by 2017.

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Company The current CTO, Amar Rida, is the company founder and developed the idea while doing postdoctoral work at the Swiss Federal Institute of Technology in Lausanne. Spinomix employs nine staff.

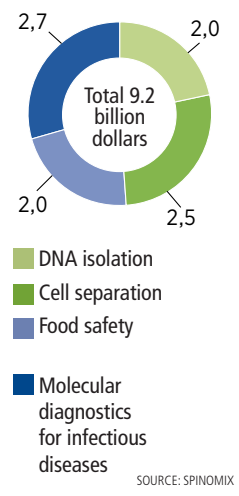
Idea Automating the preparation of laboratory samples, a time-consuming process that involves a lot of staff, to enable bacteria, viruses, cells or DNA to be analysed more quickly and efficiently.

Investors The Lausanne-based pharmaceutical company Debiopharm has invested CHF 2 million in Spinomix and is thought to be a potential licensing partner.

80%

Manual work The preparation of laboratory samples involves a lot of work. This can take up as much as 80% of the time in the laboratory, three times longer than the subsequent analysis. Spinomix wants to change this through automation.

Markets worth billions
High demand for prepared samples in analysis



SOURCE: SPINOMIX

Samples Researchers and diagnosticians in the fields of health and food need prepared samples: for DNA sequencing, cell isolation, tumour cell tests, analyses of bacteria and viruses for infectious diseases and food safety.