

More than skin deep

LMSM studies the effects of changing environmental parameters on the physiology of bacteria, and has recently begun using this expertise to help the cosmetics industry. Many of these investigations involve absorbance-, luminescence- and fluorescence-based assays, requiring strict control of the temperature inside the microplate measurement chamber for reliable results.



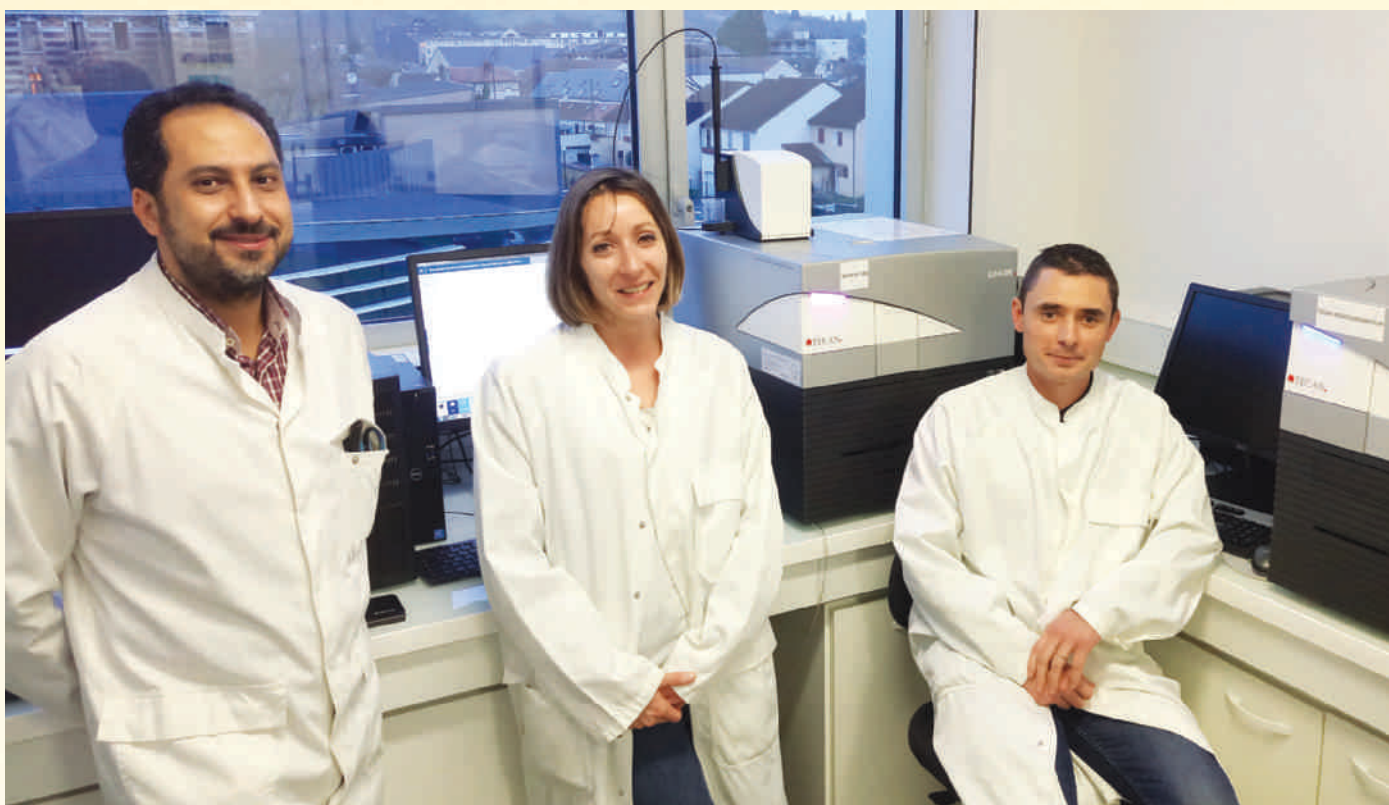
The Laboratory of Microbiology Signals and Microenvironments (Laboratoire de Microbiologie Signaux et Microenvironnement, LMSM) is part of the University of Rouen, France. First established in 1986, this specialist microbiology laboratory is home to a team of university professors and assistant professors, engineers, technicians and students engaged in projects investigating how microbiota interact with their environment.

LMSM focuses on three particular research areas – sensor systems and transducers, communication in human microbiota, and communication in plant microbiota – and works with a wide range of industrial partners, predominantly in the cosmetics and pharmaceutical industries. Assistant Professor Emeline Bouffartigues explained: “We use a variety of different approaches – including molecular and biochemical assays and cell cultures – to carry out research into the physiology of bacteria in both human and plant hosts, looking at how micro-organisms adapt to the environment. Many of our assays are carried out in a microplate format to increase throughput and save reagents, and so we recently invested in a Spark® multimode reader to assist with this work.”

“We needed a reader that could accurately and reproducibly measure absorbance, luminescence and

fluorescence in this format but, equally importantly, we wanted to be able to precisely regulate the temperature within the measurement chamber. The Spark reader’s integrated Te-Cool™ module gives us complete control of the temperature in the measurement chamber, enabling us to perform microbiological studies within the reader. It also opens the door to new FRET-based applications, and will allow us to broaden our skills in interatomic characterization of protein-protein interactions. Choosing the Spark reader also futureproofs the laboratory to some extent, giving us the capabilities to perform, for example, time-resolved fluorescence and luciferase assays if we have a need to use these assay formats.”

Emeline continued: “We have been using the Spark for about six months now, and are pleased with its performance. It offers everything we need in one instrument and has proved efficient and reliable; our results have been very reproducible. One of the main uses of our Spark reader is for the study of membrane fluidity in bacteria, which employs a fluorescent diphenylhexatriene (DPH) probe. The Te-Cool module is invaluable for these experiments, as membrane fluidity is affected by temperature. Strict control of the temperature in the measurement chamber is therefore essential for reliable and reproducible results,



Left to right: Ali Tahrioui, Emeline Bouffartigues and Olivier Maillot with LMSM's Spark readers

and the Spark has made a big difference to our work. It enables us to obtain physiological measurements to help answer important questions about membrane fluidity, complementing the available genetic information."

"We routinely monitor bacterial growth under different conditions while simultaneously following the expression of reporter genes. Again, the Spark and Te-Cool combination make these studies, which are also affected by temperature, a lot easier to perform. The user interface is quite intuitive too, which is a real advantage for us, as a lot of students use the system. They find the reader easy to use and can work independently without the need for in-depth training. Another benefit is for fluorescence anisotropy studies, where the Spark allows us to export raw data and perform the calculations ourselves."

“The Spark reader’s integrated Te-Cool module gives us complete control of the temperature in the measurement chamber.”

Senior Microbiology Technician Olivier Maillot concluded: “We carefully evaluated the Spark before purchase, to ensure that it would meet our needs, and it has exceeded our expectations and helped us to achieve a lot of success in our investigations. Tecan’s customer services are very responsive if we have any questions, and we have found the Spark so useful that we have just bought a second instrument for the laboratory.”

To find out more about Tecan’s cell biology solutions, visit
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To learn more about LMSM, go to
www.lmsm-lab.fr