

# Empowering CORE oncology research

**Christophe Deben and the team at the University of Antwerp's Center for Oncological Research (CORE) were the lucky recipients of a fully loaded Tecan Spark® Cyto plate reader with live cell imaging and real-time cytometry, after winning a Tecan competition in October 2019. The center is now using the instrument to support its revolutionary research in immuno-oncology.**



**Center for Oncological Research (CORE)**  
University of Antwerp

The Spark Cyto competition, which ran from April to September 2019, required labs to submit a written proposal explaining how they would use this unique plate reader's live cell imaging and real-time cytometry capabilities to further their research and advance scientific understanding. A panel of expert judges selected a shortlist from over 100 entries, and each finalist was invited to give a short webinar presentation providing further details of their research plan. The winner was Dr Christophe Deben, a postdoctoral researcher at the University of Antwerp, who explained his work: "Our

lab is primarily focused on translational research and combination therapies for non-small-cell lung cancers and pancreatic cancers. At present, my own work is on the use of patient-derived organoids in *in vitro* studies to characterize oncogenic signatures and explore novel therapies."

"When you use commercially-available cancer cell lines for experiments, you can see if a certain therapy has an effect or not, but the downside is that these cell lines have been in culture for a very long time. This means that the cells acquire characteristics that may

no longer be relevant to a patient's tumor. Instead, we work closely with Antwerp University Hospital, using material from tumor biopsies to generate both 2D and 3D spheroid models, allowing us to study how individual cancers respond to therapy."

"The culture conditions for each tumor type need to be optimized to grow in the lab as an organoid, so any technology that makes these studies more streamlined and efficient is a huge advantage. Previously, we relied on standard flow cytometry or basic microplate-based assays for these



Christophe Deben and the team at the University of Antwerp's Center for Oncological Research

experiments, but the drawback of those techniques is that you need a lot of cells to form a large enough number of organoids to study. This is very expensive, and can be difficult to achieve with limited patient material. My goal was to miniaturize all the assays, but still get enough data; I wanted to do everything in 384-well plates, reducing the number of cells required, as well as the amount of media and reagents. This was why I entered the competition to win the Spark Cyto, and it's opened up a world of possibilities!"

The Spark Cyto is proving the perfect partner for CORE's research, combining the features of multiple analytical instruments into one system. Christophe continued: "We already had an older live cell imaging instrument, but it's not really made for spheroid work. Plus, with the Spark Cyto, you can multiplex live cell imaging with just about anything. I can now combine it with different fluorescent markers, as well as assays based on luminescence. Using the Spark Cyto, I can get so much more information about how the cells are responding to certain therapies, offering more clinical understanding and allowing better translation of *in vitro* results into the likely responses that can be expected in patients. I really can do everything that I want to do with just one experiment now – instead of having to visit several labs to use various instruments – and I can monitor everything in real time, it's fantastic. Most of our experiments are now automated, so I can spend more of my time analyzing data or further optimizing our assays, rather than physically running the experiment. With a couple of hours' work in the lab, I can prepare the samples and load them into the Spark Cyto, then simply let it run – generating a week's worth of data for analysis."

“Using the Spark Cyto for this work is fantastic, giving us much deeper insight compared to standard singleplex methods. I let my imagination run wild in creating the experimental set-up for the competition, and it amazes me that nearly everything I thought of is possible with the Spark Cyto!”

"We have also recently purchased a D300e Digital Dispenser from Tecan, which allows us to 'print' drugs of interest in very small volumes directly into a microplate. This instrument can be used with the Spark Cyto to give us even more experimental data, by allowing us to test different drug combination strategies and therapies in much less time. For example, I studied two or three drug combinations during my PhD, but it was a lot of work and was incredibly time consuming, taking a full year to perform all the assays. Now, I could do the same experiments in a month – this set-up is an amazing time saver, and has really increased both the speed and reproducibility of our research. In a clinical setting, doctors want to test patient samples with up to 18 different clinically-approved compounds at a time, which would now not be a problem with the Spark Cyto and D300e. We are not limited to certain combinations or drugs, and can quickly see which combinations work best *in vitro* – it opens the doors for personalized medicine."

"We are extremely grateful to Tecan for picking our lab as the winner of this competition, and our interactions with the company – particular the

application specialists – have been very good. We've learnt a lot from each other, making adjustments to the protocol and software to work optimally with our 3D spheroids. For now, our work is purely research, but our long-term goal is to move into a clinical setting. Using the Spark Cyto for this work is fantastic, giving us much deeper insight compared to standard singleplex methods. I let my imagination run wild in creating the experimental set-up for the competition, and it amazes me that nearly everything I thought of is possible with the Spark Cyto! The versatility of the instrument means that we can use it for nearly every line of research running at CORE, and we look forward to where it will take us," Christophe concluded.

**To find out more about Tecan's Spark Cyto, visit**  
[www.tecan.com/sparkcyto](http://www.tecan.com/sparkcyto)

**To learn more about the Center for Oncological Research, go to**  
[www.uantwerpen.be/en/research-groups/core/](http://www.uantwerpen.be/en/research-groups/core/)