Faster Pharma

Tecan's MultiChannel Arm™ 384 (MCA 384) has revolutionized the laboratory workflow in the Division of Cancer Research at the Institut de Recherches Servier, allowing scientists to simultaneously process multiple assay plates for compound screening, as well as increasing the number of compound and enzyme combinations tested per run.

Servier is the leading independent pharmaceutical company in France, specializing in pharmaceutical research and development for oncology, metabolic conditions, and cardiovascular and central nervous system diseases. The Company's Cancer Research facility, situated on the outskirts of Paris, focuses on hit-to-lead and lead optimization for new therapeutic targets, using a range of enzymatic and cellular assays for compound screening.

To improve the laboratory's throughput, the team uses automated screening techniques, as Thomas Edmonds, pharmacology research technician, explained: "We originally started automating our liquid transfer protocols seven years ago, and purchased our first Tecan liquid handling system in 2004. This original Freedom EVO® 150 instrument was equipped with an eight-channel liquid handling (LiHa) arm. A robotic manipulator (RoMa) arm was later added, allowing us to perform low to medium throughput primary compound screening. As our panel of assays has developed, we have found it necessary to increase the flexibility of our system, in terms of the number of enzymes that can be tested per compound and the number of compounds that can be tested in parallel. To achieve this, we needed the option to work in either 96-well or, preferably, 384-well plate formats, and so upgraded to a new Freedom EVO platform with an MCA 384 pipetting arm in addition to the eight-channel LiHa arms. This new arm is equipped with a 384-channel pipetting head and both 96- and 384-channel adaptors for buffer transfer and plate replication, as well as a gripper option for plate manipulation. By using this multi-functional arm in conjunction with the LiHa arm for enzyme dispensing, we are able to schedule multiple assay plates per run, with the LiHa and MCA operating simultaneously. This is a major advantage for us, allowing the system to set up the next plate while the previous one is running, and increasing our throughput rate."

Thomas continued: "Both the MCA and LiHa arms are set up to use disposable tips, and our platform has sufficient storage capacity for our needs, holding up to twelve 50 µl MCA disposable tip boxes and four 125 µl boxes. Each plate contains 12 concentrations of 15 different compounds in duplicate – plus 3 controls – offering a capacity of up to 60 compounds per run. We have two major assay protocols, with incubation times of 40 and 100 minutes, giving total run times of four and six hours respectively, for four 384-well plates. By running several shorter assays during the day, and one longer protocol overnight, we are able to maximize throughput of the Freedom EVO system."

"Each compound is tested with around five different enzymes, using time-resolved FRET (TR-FRET) assays based on LANCE® technology. The Tecan platform is equipped with a variety of modules to allow complete automation of these protocols, including a cryostat, several plate shakers and shaking incubators set at 22 °C for plate incubations and 4 °C for enzyme and reagent storage."

"When the workstation was first installed, an application specialist from Tecan spent time setting up the platform to ensure seamless integration of these additional modules, as well as assisting us in developing our assay scripts. Despite being such a complex system, it took only a short time to set up the original eight programs, and we have since developed a further two scripts which perform functions downstream of the secondary compound screens. The panel of enzymes we use for compound testing is continually expanding, but it is quite straightforward to adapt the schedule from one protocol to another, depending on the type of enzyme being assayed. We have a general protocol for a majority of our assays, and have adjusted the biological parameters – such as reaction volume and incubation time – to perform parallel processing of multiple enzymes on a single protocol. Tecan has been very helpful in the installation of this screening platform, and we have an excellent working relationship with the Company's engineers, who are willing to help us with any changes to the system or software and, overall, are very efficient." Thomas concluded.

To find out more on Tecan's Freedom EVO workstation and Drug Discovery Solutions, visit **www.tecan.com/mca384**
www.tecan.com/drugdiscovery

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Jacques Van Opstal (Application Specialist, Tecan France) and Thomas Edmonds (Research Technician, Institut de Recherches Servier) with the Freedom EVO platform