

Clever tip packaging to save on space and waste

Nested MCA™ 96 disposable tips from Tecan are now routinely used at Roche, Switzerland, not least due to the savings on space and waste compared to conventional disposable tips. In combination with the team's Freedom EVO® systems, the new tips have also increased assay throughput.

Scientists in the *In Vitro* Enzymology and Drug-Drug Interaction Group within the Drug Metabolism and Pharmacokinetics Department in Roche, based in Basel, Switzerland, use a total of five automated systems from Tecan, including two Freedom EVO 200 platforms, for their compound assays. Pascal Schenk, Biochemistry Assistant responsible for automation in the department, explained: "When we needed to upgrade our automated systems, which are also based on older Tecan platforms, it made sense to get a Freedom EVO system as the combination of speed, flexibility and accuracy it offered suited our needs. We run about 20 different experiments on our two Freedom EVO 200 systems and they are great to work with, as we have significantly improved efficiency with these systems. Many years ago now, our department carried out all the assays manually with very low throughput; a large assay which we now run in only four hours would have taken one year if performed manually, testing one compound at a time. Similarly, the work which it recently took a colleague a week to carry out using an old automated system, now only takes five hours on a Freedom EVO 200 system equipped with a 384-channel Te-MO™ module."

"My role is to take responsibility for programming scripts on Freedom EVOware®, and the training of any personnel in the department who work with our Tecan systems," Pascal added. "I have also developed a collaborative relationship with Tecan, and regularly try out new ideas and products for them, and was one of the first to trial the new nested MCA 96 disposable tips. As we run very short pipetting intervals, we are using disposable tips to save time in our schedule, as we can then



The *In Vitro* Enzymology and Drug-Drug Interaction Group (l to r): Pascal Schenk, Stephen Fowler (head of laboratory) and Vittorio Bona.

leave out the washing steps. The MCA 96 disposable tips have been a great success for us, not least also because they are packaged in smaller boxes and require less storage space compared to conventional non-nested disposable tips. Space makes a real difference as this lab consumes about 900,000 disposable tips annually. Using nested disposable tips also means we generate far less waste compared to the previously available disposable tips and therefore save on waste disposal cost. Instead of 10 boxes each containing 96 disposable tips in one column on the Te-Stack™, we can have 40 inserts of 96 nested disposable tips in the same amount of room, giving us a four-fold increase in the number of tips stored in the same amount of space. The nested tips also allow shorter pipetting time intervals,

offering increased assay speed and assay organization flexibility. As Tecan has only changed the packaging of the tips, we still have the same accuracy and precision with these tips, with typical coefficients of variation (CV) of less than 2 % with volumes of 1 µl, which is really excellent."

Pascal continued: "Each of our two Freedom EVO 200 platforms has several modules. The first system is also used for transcellular transport assays, and includes a multitude of modules: a LiHa arm, a RoMa arm, a MultiChannel Arm™ 96 option, five Te-Shake™ orbital mixers with heating plate (37 °C), a Te-Stack module storing nested MCA 96 disposable tips, a CO₂ incubator and a special tilting carrier. The second platform has both a Te-MO 384 and an MCA 96.

It also has a RoMa arm, a microplate reader, and two incubators each taking six 384-well plates, three Te-Shake orbital incubator/mixers and a Te-Stack with the MCA 96 module and again nested MCA 96 disposable tips. The Te-MO 384 module handles the primary *in vitro* drug-drug interaction screening assay which determines the IC_{50} values for inhibition of drug metabolizing enzymes in human liver microsomes. Serial dilution of the test compounds in the 384-well plates takes place using the MCA 96 head and disposable tips and the plates are then transferred to the Te-MO 384 module, which pipettes all the reagents, starting solutions and quenching

solutions for incubations. The special feature of the Te-MO 384 module is its precision ($CV < 3\%$ for volumes of 250 nL) which allows total incubation volumes of 50 μ L to be used with a DMSO content of 0.5 %. In addition, the existence of three spatially distinct cooling positions for the human liver microsomes and the start reagent greatly help with assay organization."

"Together, both Freedom EVO systems allow us to test 150 different compounds in one day in our higher throughput assays, leaving time for us to run the other standard assays, as well as some special ones. This flexibility offered by the Tecan systems has been vitally

important for our assays, and, increasingly, other groups in our department are asking us about our systems and the assays we can run on them. We hope to purchase another Tecan system in the near future."

"I am really pleased with the Tecan systems and very happy with the support and close collaboration we have had with Tecan Switzerland. Using Tecan systems and disposable tips to automate our assays has dramatically changed how we do our work," concluded Pascal.

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Scientific instrumentation. Not for use in human clinical or *in vitro* diagnostic procedures.



The Te-Stack alongside the Freedom EVO workstation stores nested disposable tips for the liquid handling applications.



The tilting carrier allows complete removal of liquids from the wells.