

# A natural affinity

Receptor binding assays form an integral part of the preclinical screening service provided by Eurofins Pharma Discovery Services division. The first stage of the protocol is the transfer of tissue samples to a 96-well plate, a process that must be carefully performed to avoid any cross-contamination.



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Receptor binding assays are a key tool in the pharma industry, enabling scientists to study a compound's affinity for a chosen receptor. Compounds are dispensed into a microplate, then membrane receptors and the radiolabeled ligands are added. This is followed by an incubation step, after which the radioligand-receptor complex is harvested, and the amount of radioactivity is determined to calculate the degree of binding that has occurred.

Eurofins Pharma Discovery Services division, based in Taipei, Taiwan, is a contract research organization with a worldwide customer base of pharmaceutical companies engaged in drug discovery. The company has several decades of experience in preclinical screening and offers a comprehensive service portfolio. To help with its radioligand receptor binding assays, Eurofins has automated its tissue dispensing process on a

liquid handling platform. This has a number of benefits: it is highly flexible – allowing a variety of sample transfer requirements to be accommodated – assay plate preparation is consistent, and cross-contamination is virtually eliminated compared to manual processes. In addition, the automated tissue dispensing platform provides full sample traceability, which is increasingly being demanded by customers in this sector. Scientists gain too, as they have extra time to devote to other tasks. Andy Chou, an associate scientist in the Molecular Operation Department, explained: “Our department mainly performs receptor binding assays, which involve several liquid handling steps. These include dispensing of test compounds and tissue preparations, as well as the addition of radioligands. More than 10 years ago, we automated our compound dilutions on a Freedom EVO® platform, followed a few years later by the installation of a second system for addition of the radioligands. More recently, we have added a

third workstation – a Freedom EVO 100 – customized for our tissue dispensing protocols.”

The tissue dispensing process begins with uploading the assay plate preparation requirements to the LIMS. Barcoded low residual volume troughs containing the tissue preparations – five tissue types per batch – are loaded onto the workstation and scanned by a PosID™ Positive Identification System. Information corresponding to the barcode identification is extracted from the LIMS and a Freedom EVOware® worklist is created for the preparation of 96-well assay plates. Up to six 96-well assay plates per batch are placed on the carrier, and the preparations are transferred into the plates via a MultiChannel Arm™ 96 (MCA96) using disposable tips. Once the transfer is complete, a report is generated for each assay plate and exported to the LIMS, ensuring sample traceability. Downstream processing – incubation, harvesting and radioactivity measurements – then takes place.

Phyllis Tsai, also an associate scientist in the Molecular Operation Department,

“The risk of cross-contamination was always a big concern, but automated pipetting using disposable tips eliminates this problem.”



The Eurofins team

continued: “With a diverse range of requests from our customers, we need to be extremely flexible in terms of the assays we perform, and the Freedom EVO helps us to achieve this. Of all the systems we assessed, it was the platform best suited to our needs, enabling us to pipette by row or column – 8- and 12-channel dispensing – using the MCA96. It also allows us to pipette into two rows of a microplate simultaneously, a functionality that is not available on other liquid handling workstations. Another important feature of the system is its ability to incorporate our customized 24-well troughs, which have a low residual volume of less than 0.8 ml, on a Te-Shake™ shaker. Tissue preparations are very precious, and it is important to minimize any waste as far as possible; the customized troughs significantly reduce the tissue volume required for our assays.”

“Previously, the risk of cross-contamination was always a big concern, but automated pipetting using disposable tips eliminates this problem, increasing the robustness of our assay results. The

consistency of the assay plates prepared is good too, with the inter-plate variation around 2 % CV. Implementing automated procedures that employ barcode reading – importing and exporting data directly from and to the LIMS – is another key benefit, linking each tissue preparation to a specific position in the microplate. This ensures we maintain the sample traceability that is vital to our customers,” Andy concluded.

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The Freedom EVO offers flexibility and sample traceability for receptor binding assays



Radioligand binding assay workflow

