

Managing worldwide compound delivery with REMP technology

As a result of the relentless pace of today's drug discovery, pharmaceutical companies face ever-increasing throughput demands for compound screening and lead identification. Many pharmaceutical companies have active screening libraries that contain hundreds of thousands or millions of compounds, and effective and reliable management of these samples is critical to drug development processes.

Boehringer Ingelheim is one of the world's top 20 pharmaceutical companies, with headquarters in Ingelheim, Germany, and 143 affiliated companies spread around the world. The company's principle research site is based in Biberach, Germany, where current research focuses include diseases of the central nervous system, metabolic disorders and respiratory diseases. At Biberach, the Screening Support group relies on several REMP automated sample storage and retrieval systems to provide compound management services for Boehringer Ingelheim's high throughput screening (HTS) laboratories and other laboratories worldwide.

Dr Gerhard Mihm, head of the Screening Support group, explained what the services involve: "On a daily basis, we need to be able to acquire compounds, register the compounds into our corporate and dispensary databases, store them under appropriate conditions and/or provide them to our customers in various HTS and project laboratories, on time and prepared to high standards of quality. We deliver compounds in either solid or dissolved forms and sample preparation includes weighing, dissolution and plating. There are only six of us within the group providing this service, so it is essential that all of our processes are highly streamlined and very efficient, otherwise we could not possibly cope with these requirements."

The compounds come from various sources, including archive compounds that have been previously synthesized by Boehringer Ingelheim's medicinal chemists, screening compounds from the combinatorial chemistry groups, and many externally acquired compounds. The Screening Support group was established 15 years ago and its workload has dramatically increased during this period. "Over the years, the number of compounds to be managed has increased tremendously, as have the numbers of assays and additional requirements from our many different customers. In order to cope with these demands, we rely heavily on our REMP sample storage systems," said Dr Mihm. "We now have more than 800,000 compounds in our collection so our service would not be possible without this technology."



Dosage and Solution Preparation Station with tube sealing and capping.



The REMP Dosage and Solution Preparation station.



The Screening Support group's sample store.

“We first started talking to REMP back in 1996,” continued Dr Mihm, “and one of the key reasons we chose these systems was for the rapid service and maintenance the company could offer us. We were also convinced that the technological concepts of the REMP systems would meet our requirements. In 1998 we had the first ever REMP solution store for 96-well tubes installed and, since then, we have acquired three more automated REMP systems. These include stores for our solid samples and a -20°C store for compound solutions using REMP 96 and 384 Tube Technology™ consumables and automated cherry-picking functions. Due to the constant growth of our collection, a new plate store at -20°C was implemented at the end of 2006 as well as an expansion of our vial store to accommodate another 250,000 vials.” With the REMP technology, the Screening Support group can comply with Boehringer Ingelheim’s preferred practice of using single-use only tubes and plates for the DMSO solutions, ensuring high quality, contamination-free samples for all of its laboratories.

In addition to the REMP storage systems, the group depends on a number of REMP workstations, including the REMP Automated Plate Replicator™ (APR) for copying plates and the REMP Dosage and Solution Preparation Station™ (DSP; a collaborative development between Boehringer Ingelheim and REMP) for automated weighing of solid compounds in vials with special REMP weighing caps, and for preparing stock DMSO solutions and generating 96-well mother plates. Compounds that are already available in microplates or

96-well tubes are dissolved and plated with a Tecan automated compound dissolution and reformatting system (CIPDISS). This new system is based on a Freedom EVO® liquid handling workstation and includes a Te-MO™ 96 multichannel pipetting option and a CRS F3 robot. REMP devices are also integrated with the workstation, including the Automated Capper/Decapper™ (ACD96) and the LHS heat sealer. Boehringer Ingelheim’s engineers have developed another Freedom EVO-based workstation (CIVDISS) for dissolving and plating solid compounds that cannot be weighed automatically.

“In general, we are happy with REMP technology. For us, the development of an excellent relationship with the people at REMP has been a major benefit. Communication with them is absolutely perfect in most cases and it could be described as more like a partnership than a vendor-buyer relationship,” Dr Mihm concluded.



Automated Plate Replicator for copying plates.



Dr Hans-Peter Sattler, Project Manager, Tecan Integration Group and Nadine Hauser, Laboratory Assistant, Boehringer Ingelheim.