

TECHNOLOGY  
TOOLS & TECH

# Ideas Come Out of Storage

*Taking cues from past technologies, TTP LabTech finds novel ways to store, retrieve, and dispense chemical compounds*

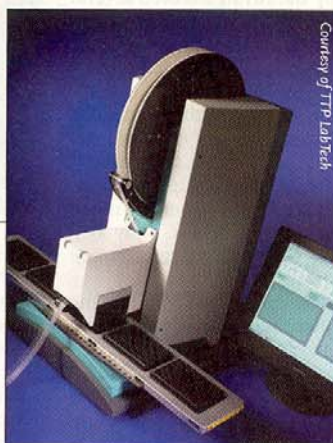
With a flash of art deco teal and some vintage engineering decisions, TTP LabTech is making 21st-century science look decidedly retro. Inspired by the pneumatic systems once used to shoot money through tubes in banks, the company's comPOUND storage and retrieval system dispatches chemical vials with a whoosh of air. Its mosquito liquid-handling system, meanwhile, looks a bit like a 35-mm film reel or perhaps a bandolier. ([www.ttplabtech.com](http://www.ttplabtech.com))

Before comPOUND's debut, chemical libraries lived in walk-in freezers or temperature-controlled buildings that housed robotic storage and retrieval systems. "But a number of companies asked if we could produce something smaller and modular," says Jas Sanghera, commercial director of TTP LabTech of Melbourn, UK.

The company decided that robots and conveyor belts are too bulky and unreliable at subzero storage temperatures. Instead, it designed the freezer-sized pneumatic system, which stores 100,000 vials and takes five seconds to find and deliver one to the front of the unit. With the aid of comPANTION, a Habitrail-like collection of ducts and a hatch, it can also whisk vials from a storage area to a lab, even if the two are on different floors.

The 1.4-ml vials fit into slots in a stack of carousels, which are sealed in dry nitrogen and maintained at -20°C. A version that will operate at -80°C is in development and the company also recently launched comPOUND D2, which holds 200,000 samples in the same footprint by storing two 0.5-ml tubes per slot.

Vertex Pharmaceuticals has used comPOUND and comPANTION since May at its San Diego site. "The modular design means that a growing company doesn't have to invest in a large, cumbersome system early on," says Hans Recker, senior director of discovery operations at Vertex, who adds that he finds comPOUND capable of handling rapidly changing project needs. Sarah Steklov, manager of comPOUND operations, likes comPOUND's compactness and ability to store an entire chemical library at low temperatures, but notes that processing takes longer when using tubes not designed for use with the system. "But the company has been very accommodating in terms of modifying their technology to support our slightly different



Courtesy of TTP LabTech



RETRO MEETS NOUVEAU: TTP LabTech's comPOUND and mosquito (inset) systems.

needs," Steklov adds.

A deluxe version of comPOUND, comPILER works with a range of automated liquid-handling systems to retrieve vials, dispense aliquots into plates, and return the recapped vials to storage. An unattended comPILER can process 15,000 vials overnight or in an eight-hour shift.

#### NEW USE FOR THE SYRINGE

TTP LabTech also produces an automated liquid-handling system called mosquito, which dispenses volumes ranging from 50 nl to 1.2 µl. "We again looked back in time and decided that the most fundamental method of dispensing anything without getting a blockage was a syringe," Sanghera says.

The mosquito's stainless steel pistons are enclosed in polyethylene barrels; a clamp raises the piston to aspirate liquid and pushes it down to dispense. The syringes, which are used only once, are mounted on a reel of plastic resembling a 35-mm projector reel, and one reel holds 36,000 tips.

Protein crystallography is one of mosquito's biggest applications, because the system can cope with solutions as viscous as honey. Yet the syringe can dispense any liquid, and even cells and chromatography beads, thanks to its relatively large orifice.

Scientists at Merck & Co. in West Point, Pa., are using two mosquito systems in dose-response drug studies. Rodney Bednar, senior research fellow, says his group needs to place low concentrations of dimethylsulfoxide directly into dry plates ahead of other assay components. "Instead of spending half a morning doing intermediate dilutions, we can use the mosquito and have all the plates done in 15 minutes," he says. He adds that disposable tips are a big advantage because they avoid carryover, though loading the reel correctly is sometimes tricky.

Research associate Scott Mosser estimates the liquid handlers save Merck about \$10,000 per year on each assay requiring human or animal serum, because smaller quantities (0.1 ml vs. 0.8 ml) suffice. The systems, he says, have improved every aspect of the group's operations. "People are thrilled with what we can do now."

—Linda Sage