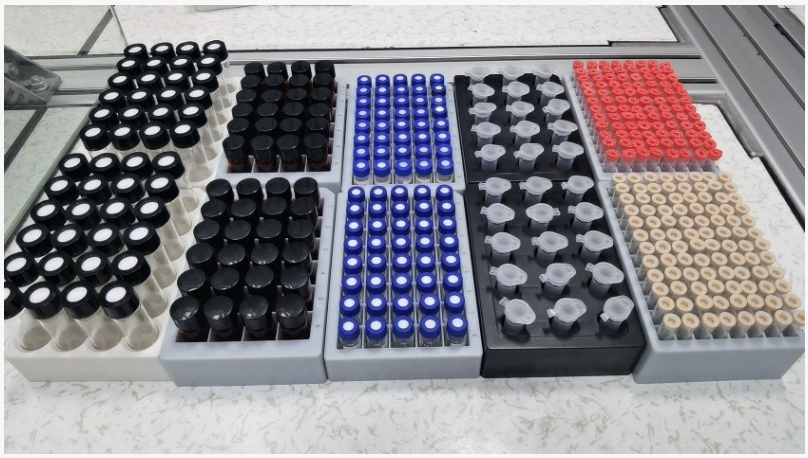
# Smart Compound Stewardship for DMPK: WuXi AppTec DMPK's Automated Compound Management with Full-Process Traceability



SAN DIEGO , CA, UNITED STATES, July 7, 2026 /EINPresswire.com/ -- Leveraging over 15 years of laboratory operational expertise, WuXi AppTec DMPK has provided compound management services to thousands of pharmaceutical and biotechnology companies worldwide, supporting a storage capacity of over one million compounds. The platform enables "full lifecycle compound management" through digital intelligent operations, ensuring end-to-end visibility and traceability from receipt to disposal to minimize human error. Core capabilities include automated robotic retrieval under various storage conditions, real-time integration of weighing data with high-precision balances, and automated separation and preparation via Hamilton systems—ensuring compounds are pre-prepared to significantly reduce wait times and accelerate project turnaround. Furthermore, the solution integrates real-time logistics tracking, image recognition-based automated picking, high-density mobile storage, and tamper-proof audit logs, seamlessly interfacing with the Mosaic Compound Management System to create a secure and transparent intelligent management loop.

Meanwhile, we have established a standardized cross-border compliance framework offering efficient import and export services, featuring full-process visualization and early regulatory intervention support for global markets, thereby significantly reducing logistical delays and compliance risks in international R&D collaborations.

Why does rigorous compound stewardship matter for R&D success?

Compound management in DMPK faces three major challenges: diverse container types, very large compound libraries, and strict storage-condition requirements. Automation depends on standardizing consumables. WuXi AppTec DMPK has developed a comprehensive compound lifecycle management system that integrates hardware, software, image-based recognition, automated handling, and systems integration to deliver automated, auditable, and scalable compound stewardship suitable for regulated and quality-conscious environments.

How do we enable real-time logistics tracking and full-process traceability?

We achieve full-process traceability through three core capabilities: real-time logistics synchronization, comprehensive lifecycle logging, and automated in-storage management via the Smart Compound Library.

1. Real-time package logistics and synchronized metadata

When a customer or third party ships a package, our system initiates continuous monitoring based on the tracking number. Automated alerts are sent to designated receivers based on pick-up and transit milestones to ensure timely attention and safe, on-schedule delivery. Real-time logistics data are synchronized and stored in our system, compensating for delays inherent in querying third-party waybill histories, and enabling one-click traceability that links each specific compound to its parcel and live transit status. The system supports integration with third-party courier platforms via API to keep metadata synchronized and tamper-evident.

2. Full-process lifecycle management with tamper-evident logs

Our whole-process management records every timestamp from dispatch and sign-off to internal transfers and final return or disposal. The lifecycle is partitioned into three stages—pre-receipt, post-receipt, and return/disposal—with photographic capture on arrival to verify receipt time, automatic logging of intra-company transfers, and explicit time nodes for returns or destruction. All operational events, including receipt photo capture, internal transfers, operators, and timestamps, are preserved in tamper-evident logs to support chain-of-custody and traceability. Compound managers can access traceable logs of compound information and transfer history

for internal review.

3. Smart compound library: accurate, efficient in-storage management
A. Fully automated intake and inventory

Simplified operations: no manual label scanning—place a rack on the temporary staging turntable to complete storage.

Simplified retrieval: operators add compound barcodes to a pick list; the system locates, picks, and delivers requested items to the staging area without prior knowledge of exact locations.

Automated inventory: image-based recognition and automated verification compare physical contents with database records and produce reconciliation records, enabling efficient, high-accuracy stock verification.

Traceability: all actions are logged with operator IDs and timestamps, preserving data integrity and traceability.

B. Image-based recognition for position and orientation detection

Extensive image training establishes standard parameters for diverse tube types and well positions. When calculated parameters fall within predefined thresholds, the system confirms presence and returns coordinates and similarity metrics. Per-well recognition thresholds account for lighting and angle variability; multiple trained parameter sets support different tube specifications to increase robustness and accuracy.

C. Flexible gripping strategies for multiple container types, 0.7–8 mL

Rack barcodes identify rack types and dynamically select the appropriate gripping scheme, including height, opening stroke, and angle. Combining these parameters with digital imagery and recognition, the robotic system reliably grasps tubes across volumes from 0.7 to 8 mL, supporting high throughput while minimizing sample damage.

D. Temperature and humidity control and intelligent pressure protection

The smart library maintains controlled temperature and humidity conditions to protect sample integrity. Pressure sensors integrated into pick operations halt automation immediately if pressure exceeds safe thresholds, protecting tube integrity during tube picking.

E. Mobile double-sided cabinets for high-density storage, approximately 4×

A movable dense-cabinet design preserves a working channel for robotic pick-and-place while maximizing storage density. Defragmentation routines further optimize rack utilization. The

result is approximately fourfold storage capacity versus fixed-cabinet layouts in the same footprint—delivering meaningful space and cost efficiencies.

How secure and integrable is the system?

The system is designed to ensure data integrity, secure access, and to meet varying project throughput.

Tamper-evident recordkeeping: All lifecycle events, including receipt photo capture, internal transfers, operator actions, and timestamps, are recorded in immutable logs that support chain-of-custody and third-party review.

Access control and data protection: Role-based access control, detailed operation logs, and encryption for data at rest and in transit protect sample metadata and operational records from unauthorized access.

Reliable audit support: The system provides detailed, automatically generated traceable logs regarding compound information and transfer history to support customer data transparency.

What business value and managed service options does WuXi AppTec DMPK offer?

WuXi AppTec DMPK delivers measurable operational and cost benefits through automation and high-density storage, and offers flexible managed-service models to meet diverse customer needs.

Space and cost efficiencies: Mobile dense-cabinet designs and defragmentation routines can increase effective storage density by roughly fourfold versus fixed-cabinet layouts, reducing lab footprint and associated overhead.

Labor and error reduction: Automated storage, retrieval, and image-based inventory reduce manual handling and human error, improving throughput and data consistency.

Full-process managed services: Offerings include sample receipt, secure storage, in-lab distribution, and return or destruction—available as full custodial services or tailored modules.

Conclusion

Digitalization and automation are reshaping laboratory operations. WuXi AppTec DMPK's end-to-end compound management and Smart Compound Library services seamlessly bridge front-end sample intake, including registration, structure confirmation, and QC, with back-end data and analysis workflows. We provide a one-stop solution featuring high-precision inventory management, automated retrieval and aliquoting, and real-time end-to-end traceability, ensuring data integrity and high-density storage efficiency.

This intelligent system not only significantly shortens compound preparation turnaround times but also helps clients substantially reduce operational costs and compliance risks by eliminating manual errors and enhancing data transparency. Ultimately, it accelerates critical R&D decision-making, enabling faster, safer, and more cost-effective DMPK research.

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