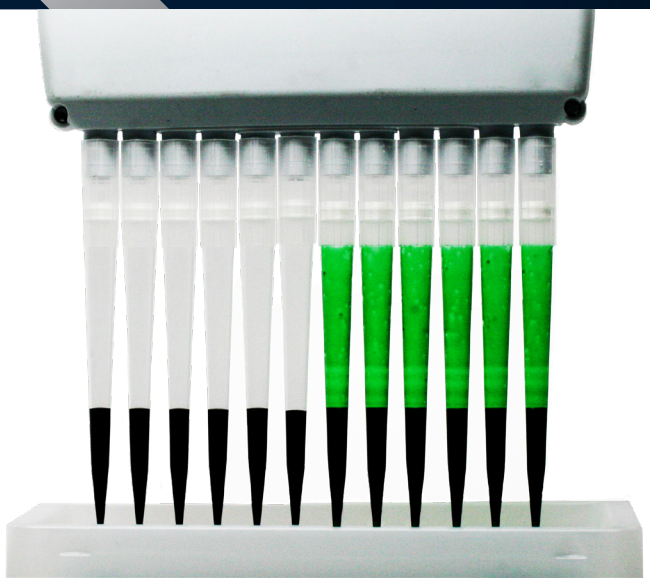
Technical Bulletin

# Superior Accuracy with X-Resin



## Pipetting Errors

For quality assurances, all critical laboratory practices are standardized. Pipetting errors can surface due to a number of factors. Inconsistent results from these errors waste research hours, reagents and valuable samples. Laboratory technicians pipette on a daily basis and while end-user error is common, an error due to the pipette tip is often overlooked.

While filter tips can reduce sample carryover, they do not address the issue of different proteins with varying levels of charge stick differently to plastics in tips, and ultimately cause sample retention.

## The Solution: X-Resin

All Biotix pipette tips are designed with X-Resin technology which provide:

Naturally low retentive qualities

Superior tip clarity

Maximal sample uniformity and improved CV values

Prevention of sample loss during pipetting

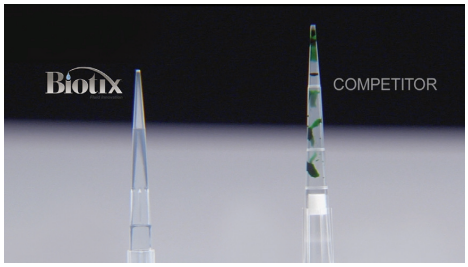



Figure 1
Biotix low retention pipette tip compared to a non-low retention pipette tip

A comprehensive study was conducted by MRIGlobal which consisted of evaluating sample loss following dispense of three different sample types: fluorescently labeled DNA; flourescently labeled protein; and nanoparticles utilizing nanocercia with detection by ICP-MS. Three tip brands were utilized: Biotix, Competitor A (low retention tip); Competitor B (non-low retention tip). An electric pipette was utilized to limit end-user variance.

## Sample Retention Testing: DNA, Protein, and Nanoparticles

Three solutions were prepared: Human DNA solution diluted to 20 µg/ml was labeled with fluorescent dye, a solution of fluorescent Bovine Serum Albumin (BSA) at 5mg/ml, and a solution of Cerium oxide nanoparticles at 82,000 ng/ml.

One hundred µl of a solution were pipetted up and down with a pipette three full times to the original tube. Then one hundred µl of $dH_2O$ of a solution was drawn up and down three full times and dispensed into a fresh 0.5 ml tube. The process was repeated for all tip brands three times with each solution. The DNA and protein solutions were analyzed residual fluorescent signal originating from retention of the solutions on the pipette tip. The $CeO_3$ wash solutions were analyzed on a Inductively Coupled Plasma Mass Spectrometer (ICP-MS) for residual $CeO_3$ associated with retention of the solution on the pipette tip.

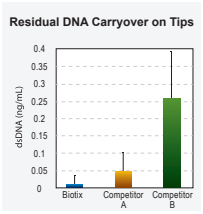



Figure 2

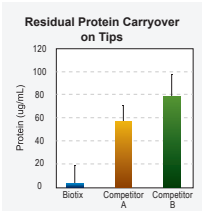



Figure 3

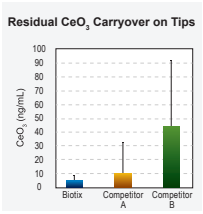



Figure 4

## Result of the Study

There was a significant difference among the three tips in the volume of sample loss due to residual solution left in the tips across all tests. As seen in *Figure 2, 3 and 4*, Biotix tips demonstrated superiority in delivering samples. Compared with competitive tips in this study, Biotix tips consistently had the least amount of sample rentention in all three categories. When working with precious samples, Biotix should be the tip of choice to ensure assay performance and data accuracy.

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