

X-RESIN® TECHNOLOGY - PROTEIN

“Pipetting error” is a phrase that is commonly heard in research laboratories. When preparing reagent cocktails, pipetting error is accommodated for. What is not typically discussed or published are the causes and ramifications of pipetting error.

Pipetting error can lead to inconsistent results especially with “sticky” or low abundance proteins. Researchers waste precious time, reagents, and valuable samples to account for inconsistent results. While user error is a common problem, one variable that many laboratories do not consider is the pipette tip.

While barrier tips or “filter tips” can reduce sample carryover, they do not address the fact that different proteins with different levels of charge stick differently to plastics in tips, and ultimately cause sample retention. In Figure 1, sample retention is demonstrated with green dye. The difference? Biotix® tips are designed with X-Resin® technology.

Biotix tips with X-Resin technology provide:

- **Naturally low retentive qualities**
- **Superior tip clarity**
- **Maximal sample uniformity and improved CV values**
- **Prevention of sample loss during pipetting**

To further examine the effects of pipette tips on sample retention, a comprehensive study (validated by an independent third party research institute) was conducted to measure sample loss after dispensing fluorescently labeled protein in three tip brands: Biotix; Competitor tip A (low-retention tips); Competitor tip B (regular tips).

FIGURE 1: BIOTIX LOW RETENTION PIPETTE TIP COMPARED TO NON-LOW RETENTION TIP, DEMONSTRATED WITH GREEN DYE



Methods:

1. A solution of fluorescent Bovine Serum Albumin (BSA) at 5mg/ml was drawn up and down 3 full times with final dispense to original tube
2. 100 µl of dH₂O was drawn up and down 3 full times and dispensed into fresh 0.5 ml tube
3. Steps 1 & 2 were repeated for all tip brands
4. Protein solutions were analyzed for residual fluorescent signal associated with retention of protein solutions on pipette tip

TABLE 1: RESIDUAL PROTEIN CARRYOVER

Sample	5 µl	10 µl	Mean (µg/ml)	SD
Negative Control	Too Low	Too Low	Too Low	Too Low
BSA 5mg/ml	Too High	Too High	Too High	Too High
Biotix - 1	Too Low	Too Low	Too Low	Too Low
Biotix - 2	Too Low	31.9	Too Low	Too Low
Biotix - 3	Too Low	Too Low	Too Low	Too Low
Competitor Tip A - 1	52.5	39.5	46	9.192
Competitor Tip A - 2	50.8	48.2	49.5	1.838
Competitor Tip A - 3	76.7	69.6	73.15	5.02
Competitor Tip B - 1	83.5	83.4	83.45	0.071
Competitor Tip B - 2	58	52.2	55.1	4.101
Competitor Tip B - 3	97.3	89.7	93.5	5.374

Results:

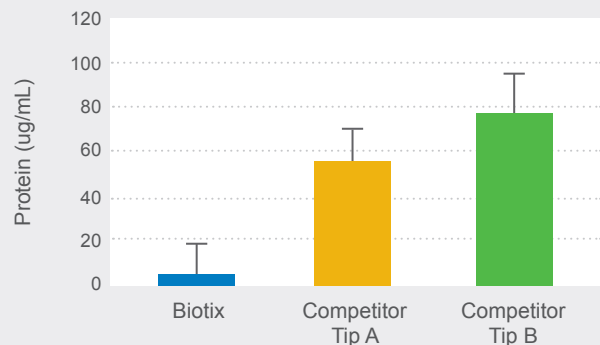
There was a significant difference among the three tips in the volume of sample loss due to residual protein solution left in the tips. As seen in Table 1 & Figure 2, Biotix tips demonstrated the least amount of protein sample loss.

Why risk your results!

Additional benefits of Biotix pipette tips that enhance the efficiency and accuracy of assay results include:

- FlexFit® technology is engineered with flexible proximal tip ends to reduce pressure from insertion and ejection forces
- Exclusive Delta Filter® technology to instantly detect contamination and reduce sample carryover – filter turns blue
- Blade® technology to minimize surface area on distal end of tips leading to better precision

FIGURE 2: GRAPH OF RESIDUAL PROTEIN CARRYOVER IN TIPS



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