

# BETTER ERGONOMICS WITH THE XTIP® PIPETTE TIP BY BIOTIX

Do your shoulders, arms, wrists, or thumbs ache at the end of a workday? You could be suffering from Repetitive Stress Injury (RSI); repetitive movement and overuse can cause damage and pain. This strain is commonly dismissed as a nuisance or a periodic issue; however, this strain may be a sign of something more serious.

Ergonomics studies have identified laboratory scientists are particularly vulnerable to RSI. It's no surprise as bench scientists and laboratory technicians typically pipette over three hours per day. Increased awareness of RSI has led many institutions to invest in more ergonomic pipettes. While most of the attention is directed toward the pipette, pipette tips are often ignored.

## How can a pipette tip reduce RSI?



To improve the health of scientists and research results, engineers at Biotix have spent years developing technologically advanced pipette tips. As a result, xTIP Pipette Tips include the same ergonomic innovations found in Biotix pipette tips—FlexFit® and Blade® technologies. The patented FlexFit technology incorporates alternating thick and thin regions along the circumference of the proximal end. When a pipette nozzle is pressed into a pipette tip, the shape of the proximal end is manipulated. With FlexFit, the thicker regions maintain structure while the thinner regions allow for flex, resulting in a secure seal with dramatically reduced insertion force.

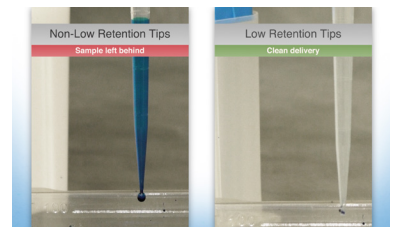
## What does insertion force reduction mean?

To better understand the force of pipette tip insertion, pipette tip racks were placed on a tared scale. We inserted pipette tips onto pipettes and measured the force required to secure a seal tight enough to aspirate dye without leaking. The xTIP Pipette Tips consistently require less insertion force than Rainin's LTS style tips. Hundreds of samples at this reduced force can prevent strain, reducing the risk of RSI.

REQUIRED INSERTION FORCE TO FORM SECURE SEAL

Tip Size	xTIP	Rainin
20µL	0.2kg	0.6kg
200µL	0.1kg	0.3kg
1000µL	0.1kg	0.5kg

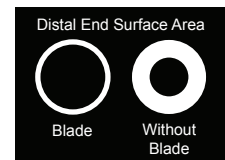
Watch this comparison of Rainin LTS pipette tips with the Biotix xTIP Pipette Tips to see which tip requires less insertion forces to achieve a secure seal on a Rainin Lite Touch pipette. [biotix.com/pressure](http://biotix.com/pressure)



## How can a tip reduce repetitive movement?

Reduction of any unnecessary movement reduces the risk of RSI.

Standard pipette tips typically require tip touch-off; surface tension at the distal end causes the formation of a droplet after sample dispensing. As illustrated on the left, Biotix has developed and engineered an optimal ratio of bore size to wall thickness. This optimal design minimizes the surface area, reducing the surface tension of your sample and the resulting droplet formation.



### How do Biotix innovations impact pipette tip performance?

To determine the accuracy and precision of the xTIP, **Troemner Corporation**, a leader in the areas of calibration and standardization, was commissioned. Three different Rainin LTS pipettes were used: 1000µL, 200µL, and 20µL along with the corresponding Rainin LTS pipette tips or the xTIP pipette tips from Biotix. Three common volumes were measured ten times each to evaluate accuracy and precision. This independent study demonstrates that xTIP performs as good or better in reproducibility compared to the Rainin LTS pipette tips.

		xTip A 1000µL				Rainin A 1000µL			
Pipette	Volume (µL)	Mean (µL)	STDEV of 10	As Found E%	As Found CV	Mean (µL)	STDEV of 10	As Found E%	As Found CV
LTS 1000	1000	996.33	0.67	-0.37	0.07	996.03	1.44	-0.40	0.15
LTS 1000	500	498.56	0.34	-0.29	0.07	497.56	0.53	-0.49	0.11
LTS 1000	100	101.99	0.20	1.99	0.19	97.97	0.14	-2.03	0.14

		xTip B 200µL				Rainin B 200µL			
Pipette	Volume (µL)	Mean (µL)	STDEV of 10	As Found E%	As Found CV	Mean (µL)	STDEV of 10	As Found E%	As Found CV
LTS 200	200	199.39	0.12	-0.30	0.06	199.58	0.14	-0.21	0.07
LTS 200	100	99.37	0.09	-0.63	0.09	99.42	0.14	-0.58	0.14
LTS 200	20	19.99	0.05	-0.07	0.26	19.96	0.04	-0.20	0.22

		xTip C 20µL				Rainin C 20µL			
Pipette	Volume (µL)	Mean (µL)	STDEV of 10	As Found E%	As Found CV	Mean (µL)	STDEV of 10	As Found E%	As Found CV
LTS 20	20	19.88	0.04	-0.62	0.19	20.03	0.06	0.14	0.28
LTS 20	10	9.96	0.04	-0.38	0.44	10.03	0.04	0.28	0.43
LTS 20	2	2.05	0.03	2.51	1.58	2.00	0.03	-0.25	1.71

### Conclusion:

xTIP Pipette Tips require less insertion force to form a secure seal, resulting in reduced, insertion and ejection forces. Less force results in less injury. Blade technology eliminates unnecessary repetitive steps. xTIP Pipette Tips improved ergonomic performance comes with equal accuracy and better reproducibility than Rainin LTS pipette tips.

**Feel the difference for yourself.**

**Order a sample of xTIP at:**

[biotix.com/products/xtip](http://biotix.com/products/xtip)

### Tips for safer pipetting with xTIP

Taken from OSHA Fact Sheet: Laboratory Safety Ergonomics for the Prevention of Musculoskeletal Disorders<sup>1</sup>

1. Elevate chair rather than reaching up to the pipette.
2. Alternate hands or use both hands to pipette.
3. Use electronic pipettes or light touch pipettes whenever possible.
4. Select a light weight pipettor properly sized for your hand.
5. Use an ergonomically-engineered pipette tip such as Biotix Universal or xTIP for Rainin LTS.
6. Use minimal pressure to insert and eject the pipette tip.
7. Take a 1-2 minute break for every 20 minutes of pipetting.

<sup>1</sup><https://www.osha.gov/Publications/laboratory/OSHAfactsheet-laboratory-safety-ergonomics.pdf>

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