

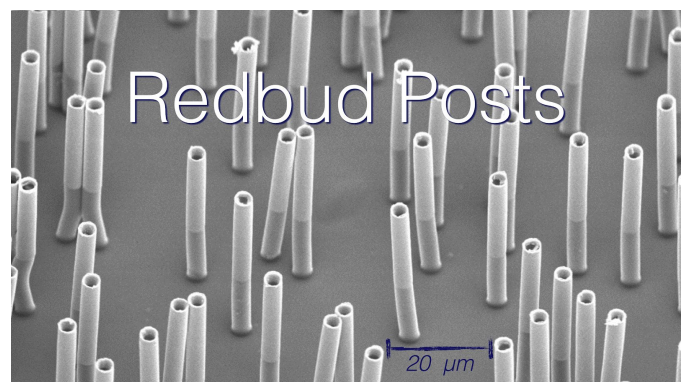


Using STR

About STR

STR (“sorter”) enables affinity separation of analytes from complex samples such as whole blood. With support for customizable capture chemistry, variable target size, and wide sample capacity range, STR addresses a variety of applications, from biomarker discovery to point-of-care diagnostics.

STR features an neutravidin surface on our patented Redbud Posts—an array of flexible, magnetic micropillars printed on a film. Redbud Posts move in response to a magnetic field, inducing microfluidic agitation for rapid and efficient target capture. STR’s standard NeutrAvidin surface enables conjugation with any biotinylated probe to develop a custom sample prep solution tailored to your assay.



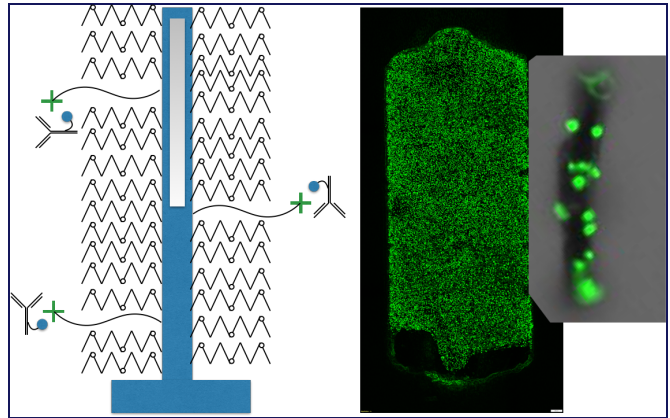
Surface chemistry

The surface inside STR chips is covalently modified to enable conjugation of a specific probe. Surface modification options for STR include:

1. Neutravidin STR
2. Inert STR
3. Custom STR

Neutravidin STR

Neutravidin-conjugated STR chips have covalent surface modifications of Neutravidin. The rest of the Redbud Post surface is passivated with polyethylene oxide glycol (PEG). Neutravidin-conjugated STR chips can be incubated with a biotinylated probe of choice for specific capture.



Inert STR

Inert STR chips have covalent surface modifications with PEG but no active binding surface. They are useful in materials compatibility testing, for example when evaluating rates of non-specific adsorption.

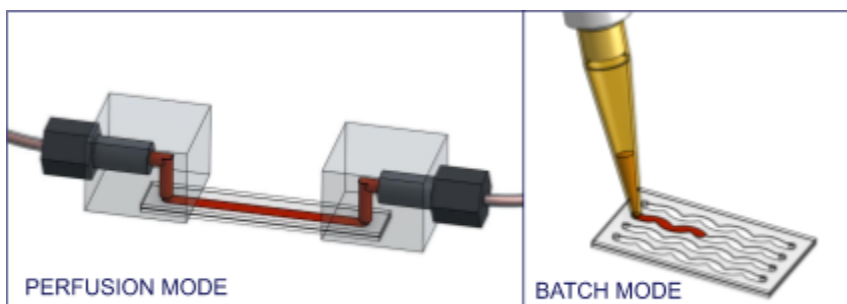
Custom STR

Once you have selected your probe, we can work with you to implement conjugation to our chips at time of fabrication, complete with lyophilization for maximum shelf stability.

Instructions for Use

STR Chips can be operated in two methods: batch and perfusion.

In either mode, avoiding bubbles is essential. Please take typical precautions such as use of debubblers in tubing and careful merging of droplets to ensure that no bubbles enter the chip.



Batch Mode: Pipetting

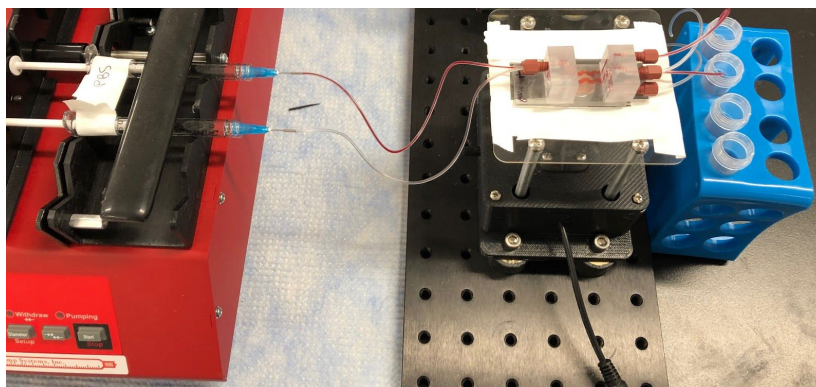
To use STR chips in a batch mode, pipet sample into the vent on the chip. Ensure the tip is snug in the vent, and avoid injecting air or bubbles into the chip. To use STR chips in a perfusion mode, manifolds with tubing connections can attach to the STR chip over the vents.

Perfusion Mode: Tubing Connections

To operate STR in perfusion mode, bond a manifold to the chip using the included adhesive. We recommend using 1/16" outer diameter (OD) tubing and a 10-32 threaded fitting and ferrule for fluidic connections. Contact Redbud if you require alternative fittings. With the tubing inside the fitting and ferrule, push the coned part of the ferrule up to the inside of the fitting. Adjust the position of the tubing so that one end is aligned with the flat bottom of the ferrule.

Next, screw the fitting (with ferrule and tubing) into the manifold. The connection should be finger tight, and when the tubing is gently tugged, it should not come loose. At this point, the tubing can be connected to the fluid source. The fluidic system can be purged of air in the tubing and checked for leaks.

To attach an adhesive-based manifold to the chip, remove the adhesive liner on the manifold. Align the manifold vent with the chip input. On a flat surface, smoothly press the manifold against the chip. The chip should now be sealed and ready for perfusion.



To attach a screw-in manifold, align the manifold screw holes with the base and screw in the manifold.

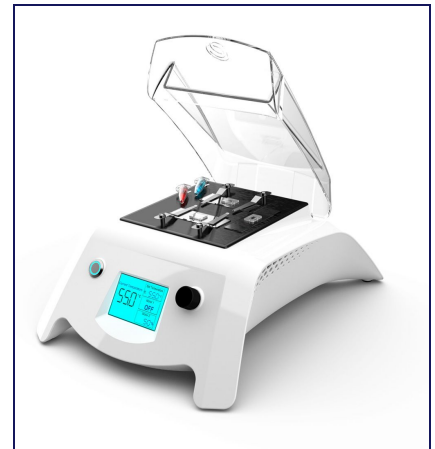
To remove the manifold: twist the manifold and the chip in opposite directions. The connection will be tight, however, the manifold can be popped off the chip for cleaning and reuse.

Conjugating the Probe

Neutravidin-conjugated STR chips can be incubated with a biotinylated probe of choice, typically at a concentration of 30 nM – 3 μ M for 30 minutes to 2 hours. Taking care to avoid introducing bubbles, inject 2x the chip volume (10 μ l) into each channel, and rinse with 10x volume of buffer after incubation period. The optimal probe concentration and incubation time will be probe and assay dependent.

Driving STR

Redbud Posts are magnetically actuated. Our magnetic drivers come in a variety of sizes and shapes, and you should receive a driver tailored to your activities. Position the driver on the bench as appropriate for your testing. When your chip is ready to place on the driver, position the active volume directly above the magnet. For most applications, the top of the magnet should be no more than 5 mm from the plane of the Redbud Posts.



Your driver may allow the selection of a rotation speed. Most applications benefit from the highest possible setting of roughly 5000 rotations per minute. However, the optimal driver speed may be lower, especially if delicate cells are involved. Contact us with any questions.