

| Epoxy Microarray Slides |

User's Guide

Catalog Ref: 405278

Introduction

Epoxy Slides provide a uniform substrate for the creation of high-quality nucleic acid microarrays leveraging the advantage of a high throughput, parallel, and multiplex format. The substrate supports low endogenous fluorescence, high signal-to-noise ratio, and robust immobilization chemistry. The epoxy coating reacts with amino, hydroxy, or thiol containing biomolecules forming a covalent bond with the activated glass surface. This format drives assay sensitivity and improves the limit of detection in genomic applications. The resulting slides are compatible with microarray spotting, hybridization chambers, colorimetric, and fluorescence-based detection techniques. Use of multi-well ProPlates™ for sample hybridization simplifies workflows, reducing sample volume, and assay optimization time. The inherent stability of covalently attached biological samples on epoxy coated slides eliminates the variability in sequential microarray spotting applications. Epoxy microarray slides are flexible and robust substrates for simplified development and superior assay performance.

Features:

- High reactivity with amino, hydroxy, or thiol containing biomolecules
- Robust immobilization
- Reproducible spot morphology
- Compatible with piezo-electric or pin-based array techniques
- Stable long-term storage after array production
- Covalent probe attachment supports hourly to multi-day hybridization based on sample complexity
- Optimal signal-to-noise due to low endogenous autofluorescence

Format

Slide boxes are provided with 25 slides each with a 22 mm x 65 mm functional area and 25 mm x 75 mm outer dimension.

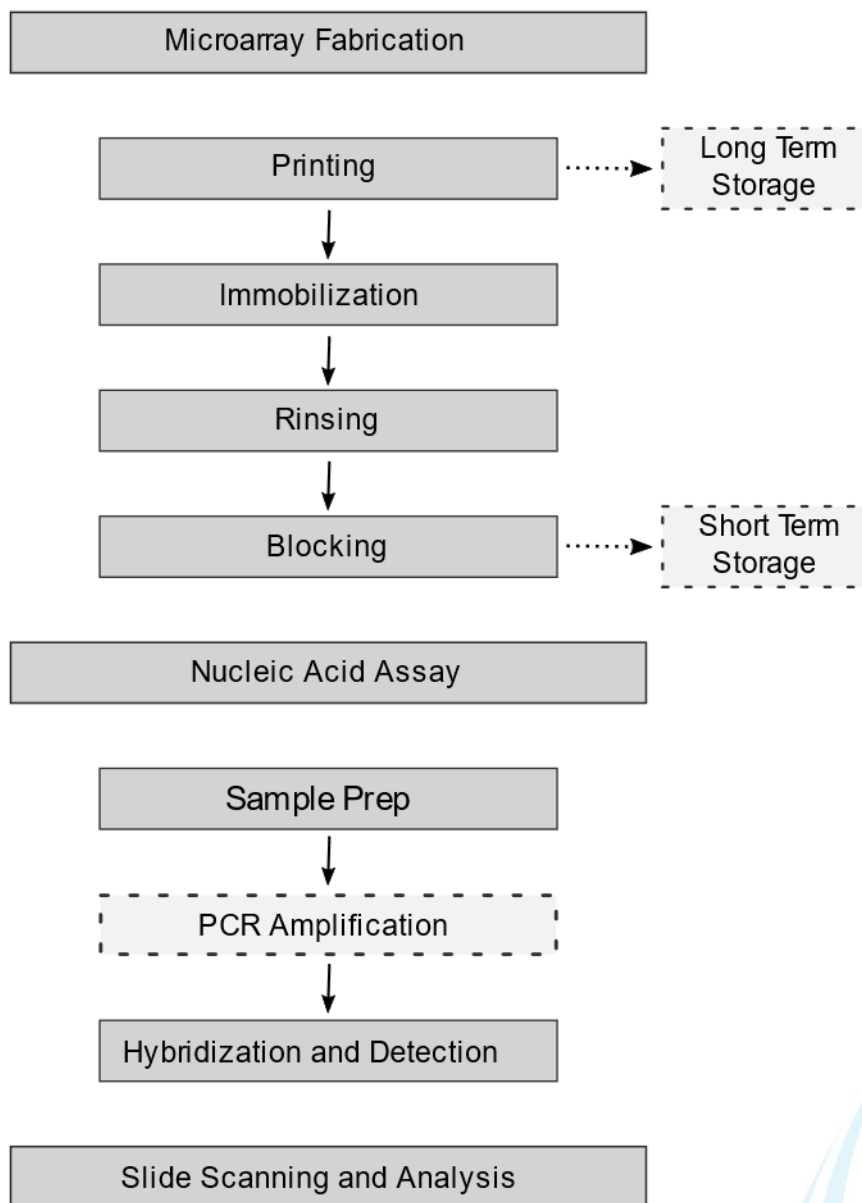
Handling

Handle with gloves and refrain from touching surface to preserve reactivity of epoxy coating. For optimal results, assay in a dust-free environment.

Storage

Slide boxes are provided in a vacuum sealed pouch. Epoxy coated slides are highly reactive under ambient conditions. Use once opened or store unreacted slides under vacuum to increase stability of surface coating. Slides are compatible with long-term storage once printed. Store between 2 - 8°C. Dispose of slides beyond their expiration date.

Workflow – Nucleic Acid Application



Dashed lines indicate optional steps

Experimental Protocol – Nucleic Acid Application

Microarray Printing

Compatible with piezo-electric, non-contact, or pin-based, contact, printing techniques.

Table 1: Suggested Print Buffers

Avoid buffers that contain primary amines, i.e. Tris, which will react with epoxy groups and compete with printed probes.

Base Buffer	Concentration	pH	Detergent at 0.001% – 0.005%
Sodium phosphate	50 – 300 mM	8.0 – 9.0	SDS, Tween 20, Triton X-100
Phosphate	150 – 300 mM	8.0	
SSC	3 – 5 x *	7.0	

*1 x SSC buffer contains 150 mM Sodium Chloride in 15 mM Sodium Citrate

- Dilute or dissolve probes in print buffer to achieve final concentration of
 - ✓ 10 – 40 μ M for amino-modified or unmodified oligonucleotides.
 - ✓ 0.1 – 1 mg/mL for PCR products.
- Print probes at 40 – 50% relative humidity at 20-25°C.
- After completion of array printing, immobilize DNA by incubating printed slides for 30 minutes at 75% humidity, 20°C.
- Proceed to rinsing or store printed slides.

Tech Tip: Humidity Chamber Preparation

Prepare enclosed humidity container - Add tray to hold slides above a large dish. Fill dish with steaming hot water, close the contain, and wait 30 minutes prior to use.

Rinsing

Rinse slides to remove unbound probes.

Completely submerge slides in solution for each step. Solution volume should be at least 50 mL per slide. A slide dish and rack with 250 mL solution or coplin jar with 50 mL solution is recommended. Do not allow slides to dry out between steps. Rinse slides using an orbital shaker at 40-50 rpm at 20-25°C.

Step	Solution	Time	Check Box
1	0.1% (v/v) Triton-X 100	1 x 5 min	<input type="checkbox"/>
2	1 mM HCL	2 x 2 min	<input type="checkbox"/>
3	100 mM HCL	1 x 10 min	<input type="checkbox"/>
4	diH ₂ O	1 x 1 min	<input type="checkbox"/>

Proceed to blocking step immediately

Blocking

Use 50 mL blocking solution per slide. A conical tube with 50 mL solution and heated water bath is recommended.

- Prepare fresh - 50 mM ethanolamine + 0.1% SDS in 0.1 M Tris, pH 9.0.
- Incubate in blocking solution for 1 x 15 min at 50°C
- Rinse slides in diH₂O for 1 x 1 min at 20 – 25°C
- Dry slides by centrifugation. 200 x g for 1 x 5 min
- Proceed to hybridization or store slides in slide mailer for 1 – 3 days.

Hybridization and Detection

A hybridization chamber, such as multi-well ProPlate™ Slide Chamber System, is recommended to reduce target volume required to assay the slide array.

- Prepare fresh – 20% formamide + 0.1% SDS in 5 x SSC
 - 1 x SSC buffer contains 150 mM Sodium Chloride in 15 mM Sodium Citrate, pH 7.0
- Dilute or dissolve target in hybridization solution, empirically determine optimal concentration
- Load target solution onto the array in hybridization chamber
- Incubate for 1 – 18 hours with 250 rpm orbital shaking at 20-25°C, empirically determine optimal concentration
- Remove target solution and rinse with hybridization solution for 1 x 1 min at 20-25°C
 - Repeat Hybridization and Detection step with labeled detector if using unlabeled target
- Proceed to washing

Washing

Wash slides post-hybridization to remove non-specific binding of target and detectors. Wash slides using an orbital shaker at 40-50 rpm at 20-25°C in the following steps:

Step	Solution	Time	Check Box
1	2 x SSC + 0.2% SDS*	1 x 5 min	
2	2 x SSC	1 x 5 min	
3	0.2 x SSC	2 x 1 min	

*Prepare solutions containing SDS fresh before use.

Dry Slides by centrifugation. 200 x g for 5 min.

Microarray Scanning

Scan slides using microarray scanner following manufacturer's recommendations. Protect processed slides from light and dust. Confirm laser and filter set on microarray scanner is compatible fluorescent labels on the array.

Product Table

Catalog #	Name
405278	Epoxy Microarray Slides
246824	ProPlate™ Multi-Array Slide System
244864	ProPlate™ Multi-Well Chambers with Stainless Steel Springs
470638	ProPlate™ Multi-Well Chambers with Stainless Steel Springs
106109	Vytal™ PBS
106108	Vytal™ 10 x PBS