

## Modified AFM Probes and Surfaces

Modified AFM probes and surfaces are powerful tools for nanoscale research. Novascan Technologies is the leading source of functionalized AFM probes and modified surfaces worldwide. Clientele benefit from a wealth of experience, proven protocols and client relationships unmatched in the industry.

### Benefits

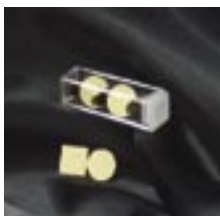
- Eliminate the time and effort required to develop effective and reliable modification techniques in-house
- Benefit from the proven reliability of modification protocols
- Large catalog of modifications provides greater opportunity for expanding the breadth of your experiments
- Excellent technical support and unbeaten customer service



Particle Probes



Unmodified Mica



Gold Coated Mica



Custom Particle Attachment

### Modified Probes

Modified probes are a perfect compliment to nearly any atomic force microscope application. Novascan maintains an inventory of commercially available AFM probes for modification. Choose from a variety of particle materials and sizes, defined chemistries and metallic coatings. Novascan's Probe and Surface Laboratory technicians welcome the opportunity to discuss custom work, including protein conjugation.

### Modified Surfaces

In addition to modified AFM probes, Novascan has developed a number of protocols for modifying mica and glass substrates. Common protocols include the application of gold coatings and defined surface chemistries. Discussion of custom modifications is welcomed.

### Potential Applications

Hydrophilic/Hydrophobic Interactions  
 Attractive/Repulsive Regimes  
 Chemical Sensing and Detection  
 Intermolecular Force Measurement  
 Intramolecular Force Measurement  
 Surface Mapping  
 Adhesion Forces  
 Unbinding Forces

## Specifications

### AFM Probe Modifications

#### Spring Constants

Novascan's Probe Laboratory modifies commercially available AFM probes. Standard probe composition and spring constant information appears below. In most cases, the Probe Lab can also modify cantilevers supplied by clients. Please inquire as to the feasibility of using your probes for a given probe modification.

##### Probe Type/Spring Constant

Silicon (N/m): 0.03, 0.05, 0.08, 0.65, 0.95, 1.75, 4.5, 7.5, 14

Silicon Nitride (N/m): 0.01, 0.02, 0.06, 0.1, 0.12, 0.32, 0.58

##### Particle Materials/Sizes

Borosilicate Glass ( $\mu\text{m}$ ): 2, 5, 10, 12, 20

SiO<sub>2</sub> ( $\mu\text{m}$ ): 0.6, 1, 2.5, 5

Polystyrene ( $\mu\text{m}$ ): 1, 4.5, 10, 25, 45

Polyethylene ( $\mu\text{m}$ ): Please Inquire

Tungsten ( $\mu\text{m}$ ): 5, 10

##### Defined Chemistries

Alkanethiols: COOH, CH<sub>3</sub>, NH<sub>2</sub>, OH, Succinimide

PEG Linkers: PEG/COOH, PEG/NH<sub>2</sub>, PEG/Maleimide, PEG/Biotin

Silanes: APTES

Biotin/Streptavidin/Neutraavidin

##### Protein Conjugation

Novascan's probe technicians have developed several protocols for the conjugation of proteins to unmodified and particle modified AFM probes. The addition of linking molecules such as polyethylene glycol (PEG) is often required. Please inquire as to the feasibility of using specific proteins.

##### Metallic Coatings

Gold

Aluminum

Nickel

Chromium

Platinum

### AFM Grade Surface Modifications

#### Substrates

Novascan's Probe Laboratory modifies AFM grade surfaces. Standard modifications include defined chemistries and metallic coatings. AFM grade, red muscovite mica and 12mm round glass are available as substrates. The modifications below may be used with either substrate.

##### Defined Chemistries

Alkanethiols: COOH, CH<sub>3</sub>, NH<sub>2</sub>, OH, Succinimide

PEG Linkers: PEG/COOH, PEG/NH<sub>2</sub>, PEG/Maleimide, PEG/Biotin

Silanes: APTES

Biotin/Streptavidin/Neutraavidin

##### Metallic Coatings

Gold

Aluminum

Nickel

Chromium

Platinum

### Custom Modifications

Novascan Technologies welcomes the opportunity to discuss custom probe and surface modifications. Custom modifications include unique particle attachment and alternative chemical and protein conjugations. Feel free to contact Novascan to discuss your application.