

# IMAGING HIGH-ASPECT RATIO NANOSTRUCTURES ON SOFT AND BRITTLE MATERIALS USING ATOMIC FORCE MICROSCOPY

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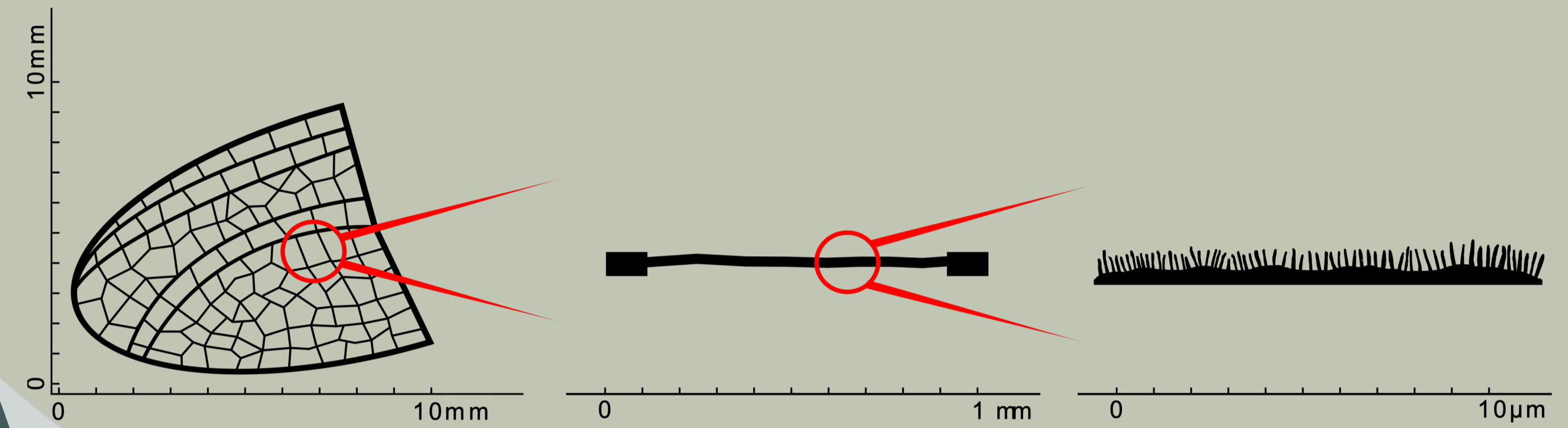
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## Introduction

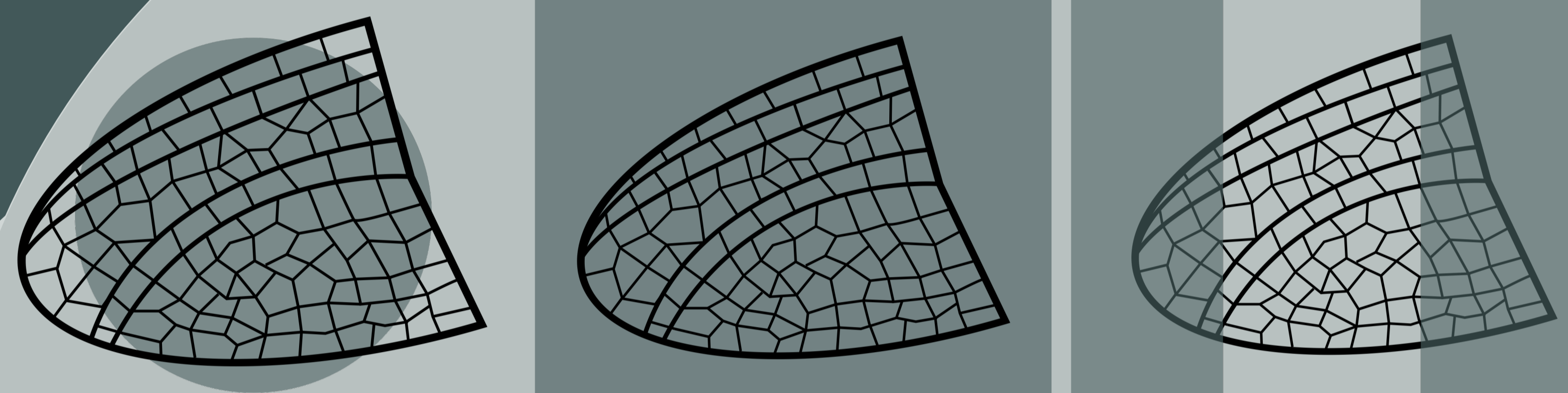
AFM is a key instrument for observations of nanostructures on biological samples (insect wings) and their artificial polymer replicas as it performs measurement without the need to alter the surface chemistry (i.e. conductive coatings). These structures are however often found on thin, soft, sticky or brittle membranes which makes the experiment setup difficult. Here we present examples of possible settings and images provided.

## Samples



## Sample preparation

### fixation

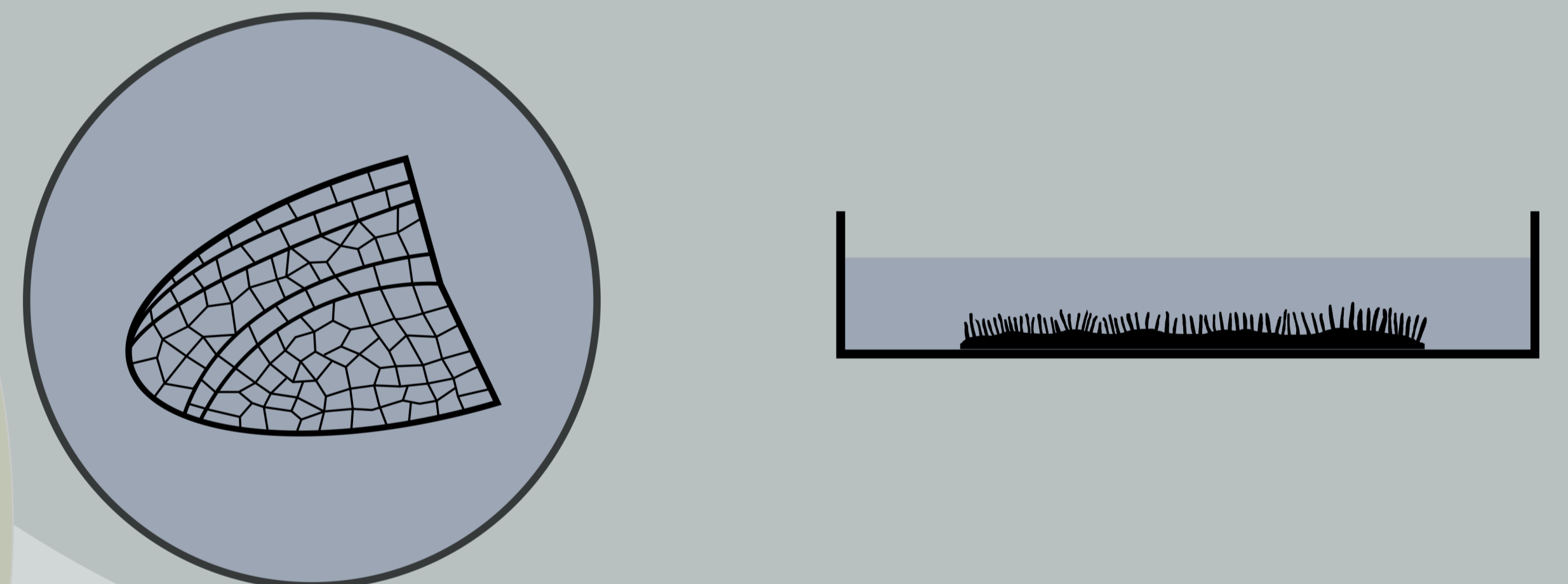


1. Liquid adhesive droplet

2. Double-sided tape

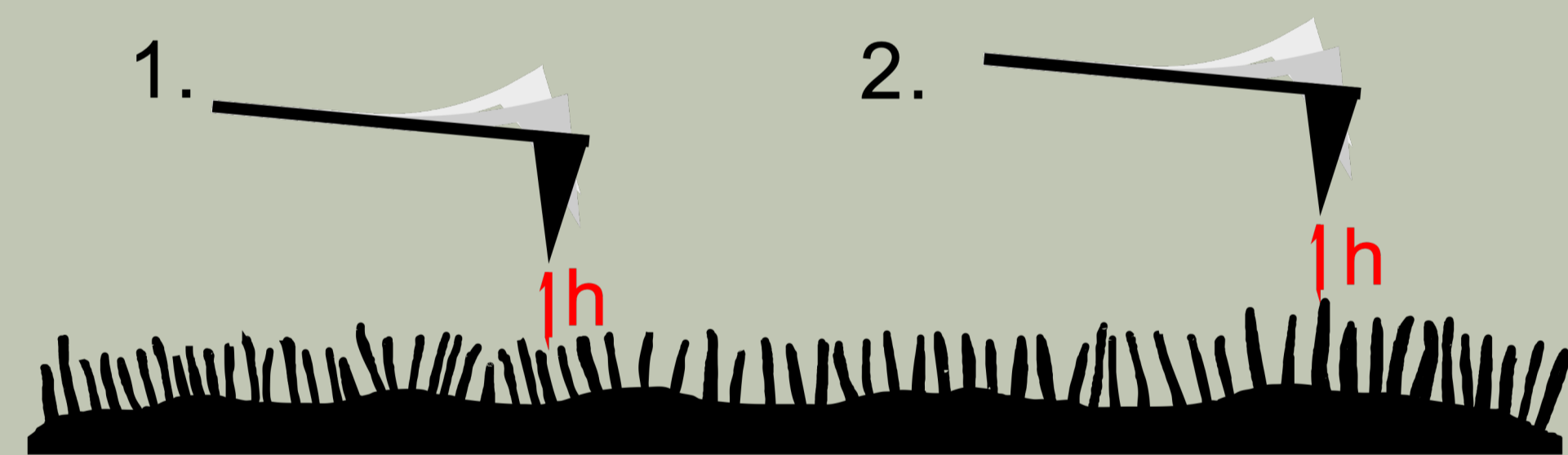
3. Stickers

### in-water measurement

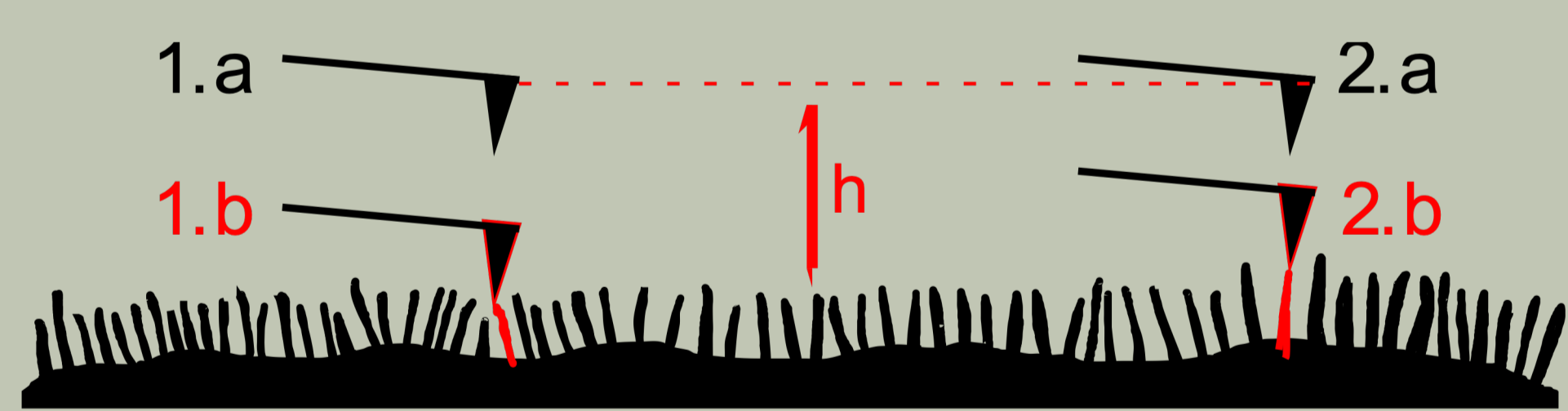


## AFM setup

### Modes



### tapping (AC)



### quantitative imaging (QI)

### Probes

- low spring constant (<5N/m, QI mode)
- sharp (<20 nm)
- pyramidal or conical
- slow scan-speed (<0.2 Hz)

### Approach

- slow approach speed or high extension time
- very small setpoints
- increased piezo sensitivity

## Conclusion

High-aspect ratio nanostructures were observed using AFM. We demonstrated multiple fixation possibilities and optimal AFM setup as well as in-water measurement for adhesion and sag decrease.

## Acknowledgment

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1. QI, liquid adhesive
2. QI, double-tape
3. QI, stickers
4. AC, stickers
5. AC, double-tape
6. QI, in-water measurement

## Images

