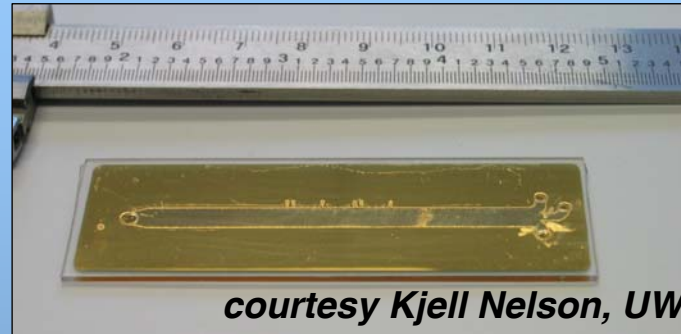


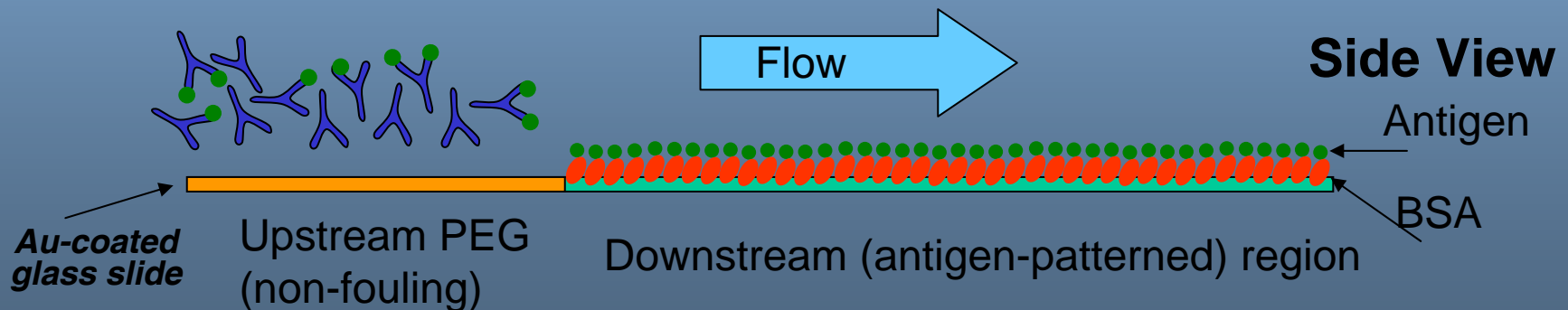
Surface Patterning for Microfluidic Diagnostic Immunoassays

Neil Geisler
Bioengineering
26 May 2006



*Gold-coated
microfluidic
immunoassay
substrate*

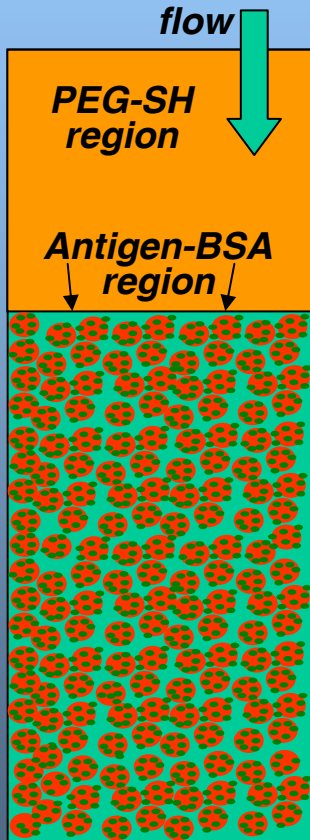
- A rapid, lab-scale deposition method by capillary wicking action for accurate surface patterning of antigens and non-fouling layers on a Au-coated glass slide for a competitive immunoassay in a disposable microfluidic lab-on-a-chip device, as detected by SPR.



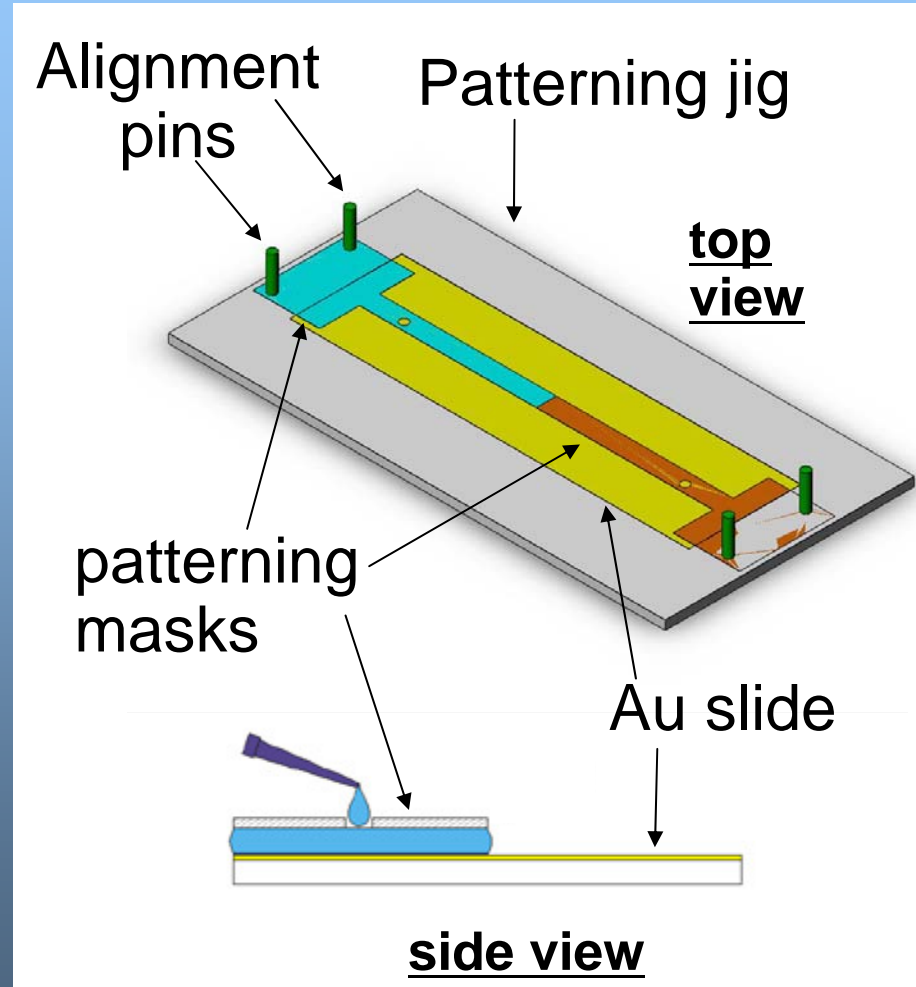
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Surface Patterning for Microfluidic Diagnostic Immunoassays

Top View



- Au-thiol chemistry
- Oxygen-plasma treated Mylar masks
- Fluid “wicks” between mask and surface via capillary action
- Solution allowed to dry/incubate
- Mask removed, surface rinsed and dried w/N₂
- Works with both thiols and proteins



Surface Patterning for Microfluidic Diagnostic Immunoassays

- Advantages:

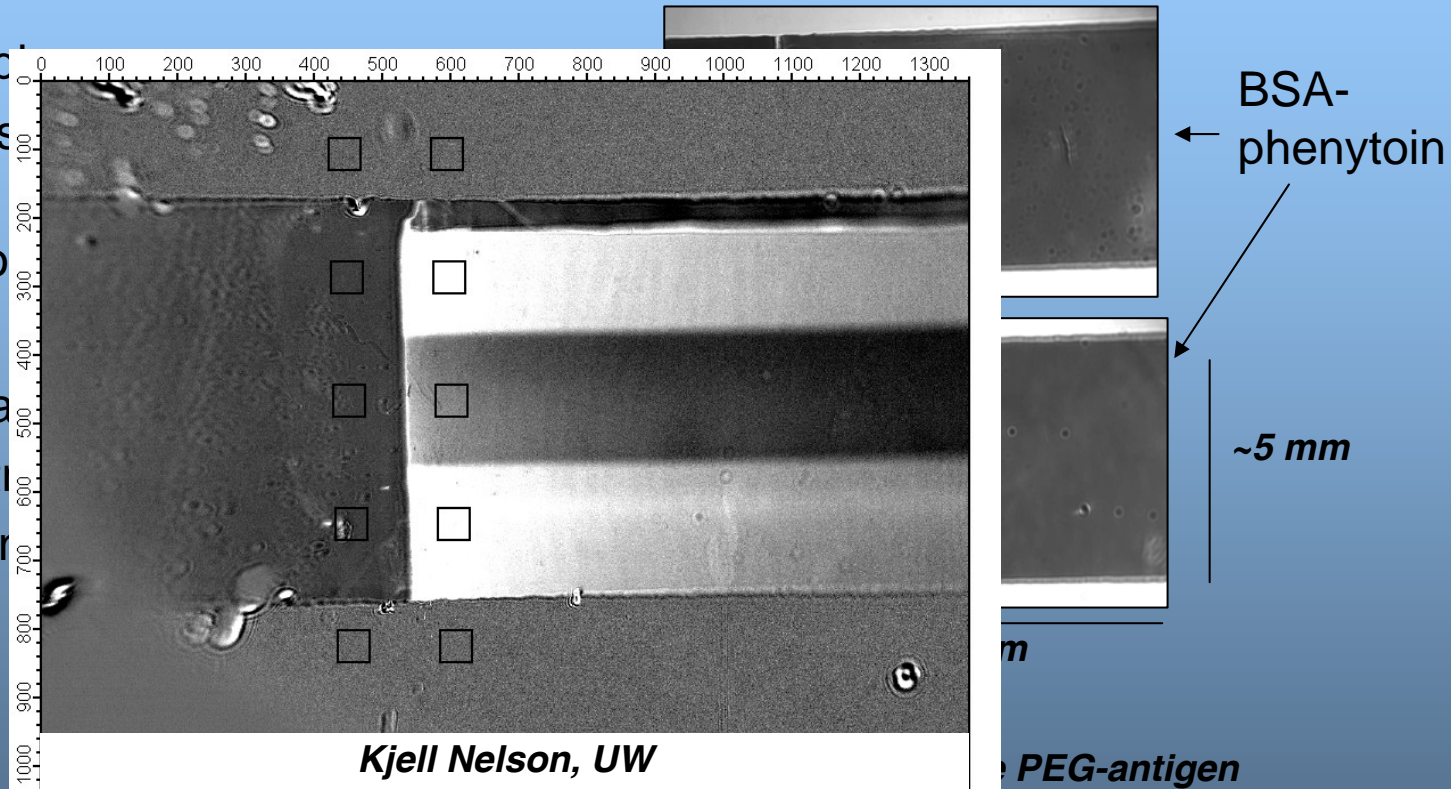
- ◆ Rapid, simple
- ◆ Large areas, efficient
- ◆ Uniform, consistent

- Alternatives:

- ◆ Micro-contact printing
- ◆ Piezo-electric
- ◆ Dip-pen nanolithography
- ◆ Etc.

- Challenges

- ◆ Scale-up
- ◆ Multiple-analyte patterning



PEG-antigen
sharp transition,
with no bleeding from one region
into the other

