

A microengraving method for rapid selection of single cells producing antigen-specific antibodies

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Monoclonal antibodies

- Advantages

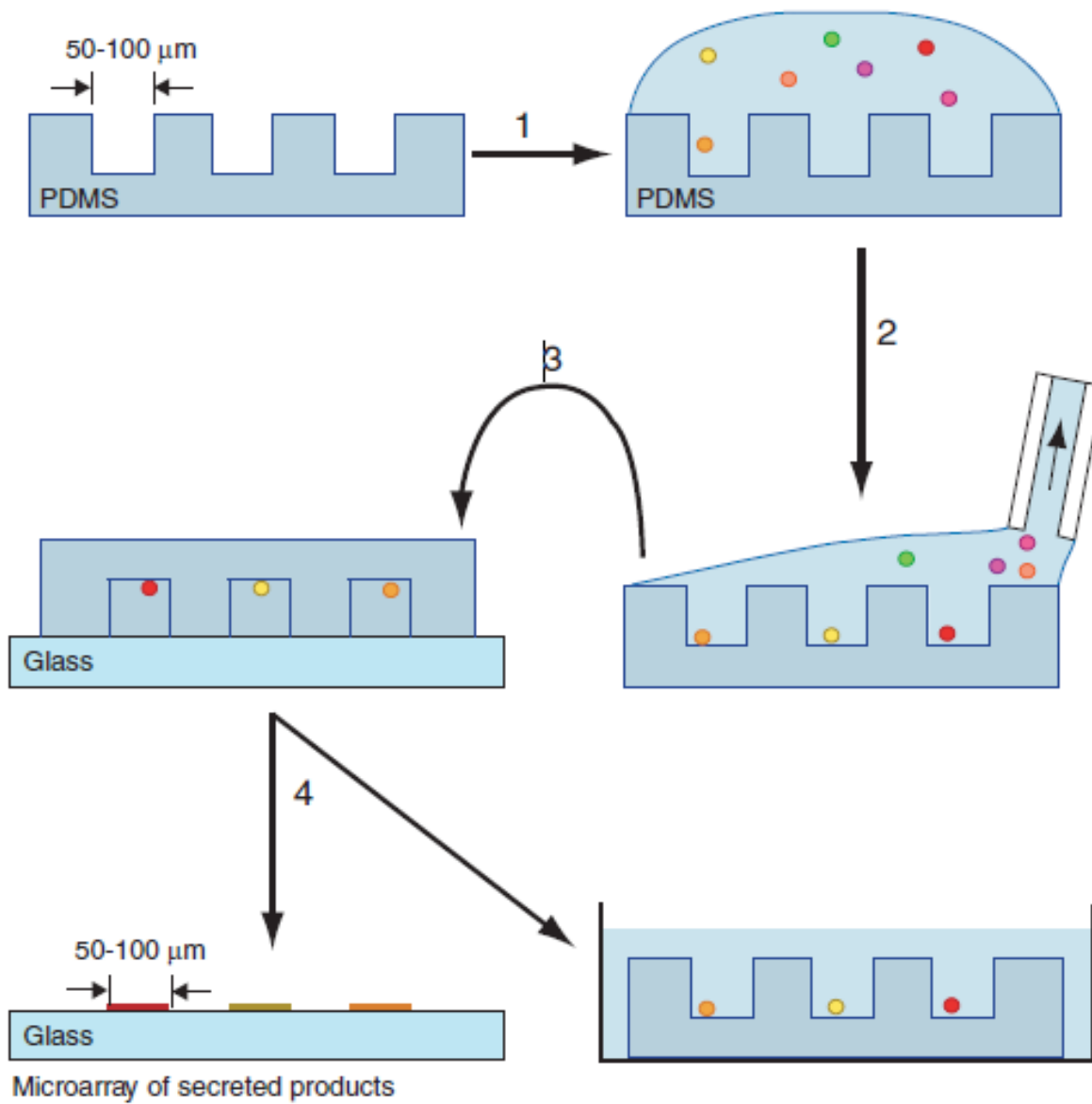
- Unlike polyclonal antibodies, they recognize only one epitope of an antigen
- High specificity
- Efficient binding
- Less background noise

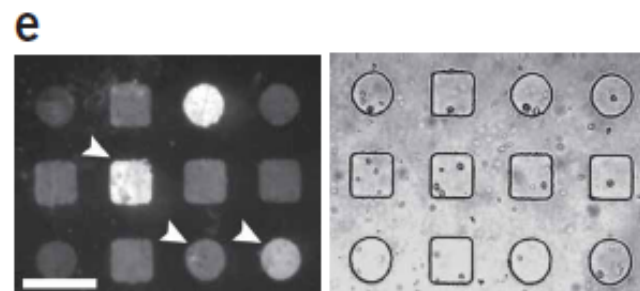
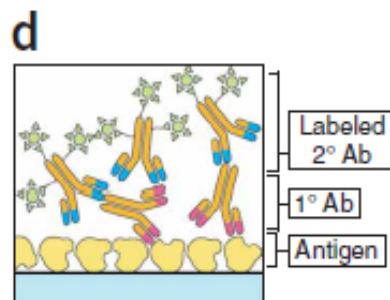
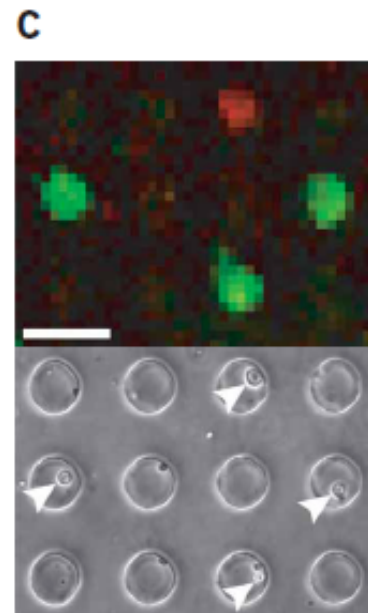
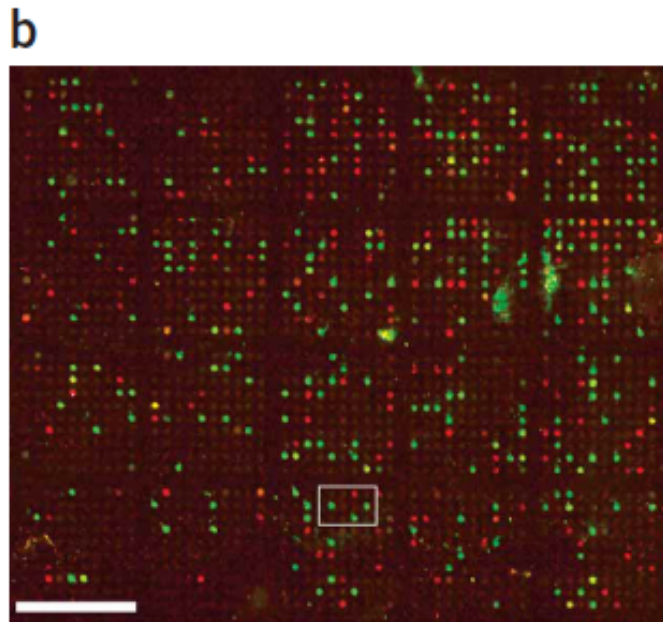
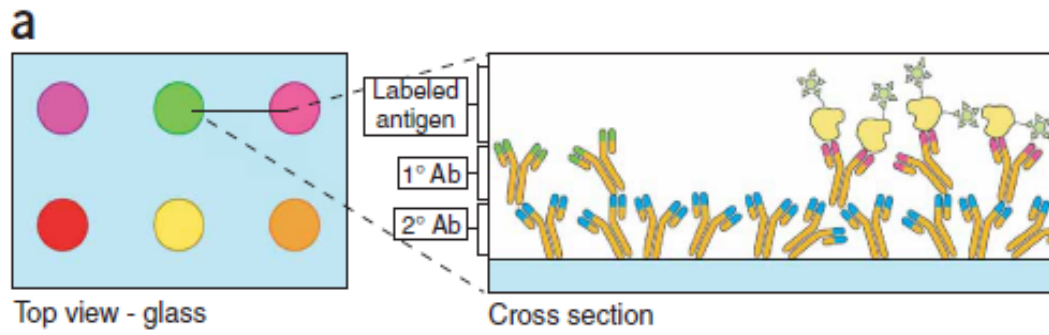
- Disadvantages

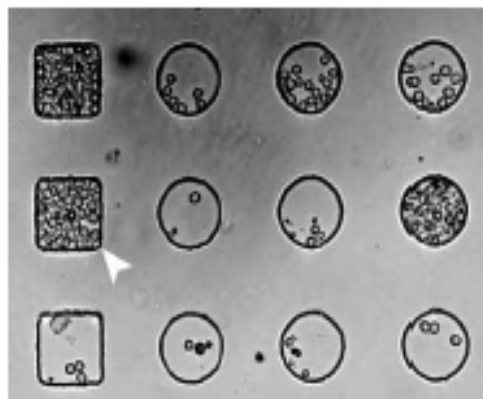
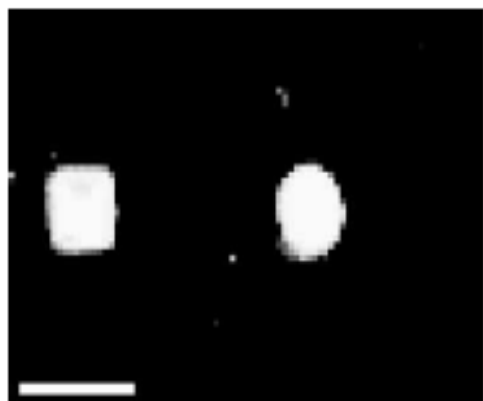
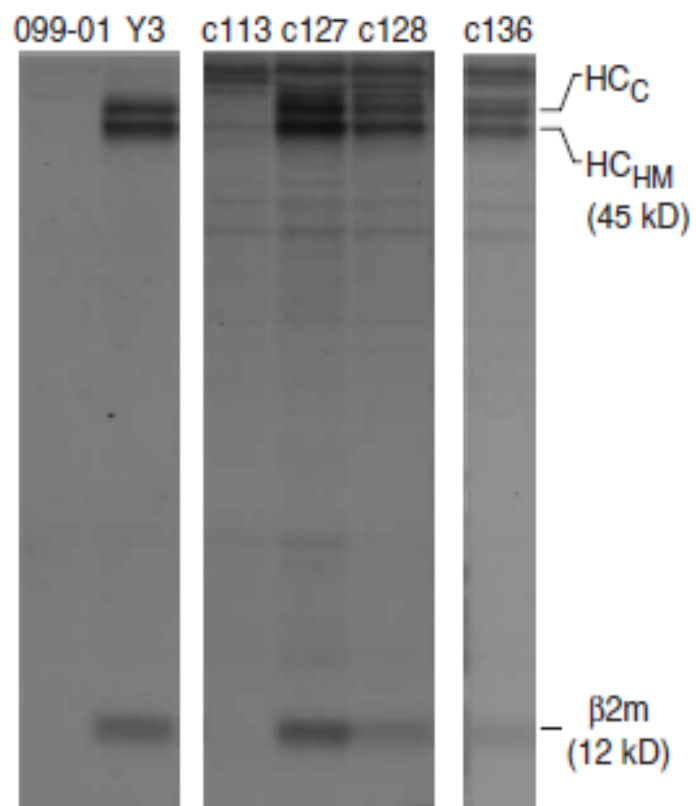
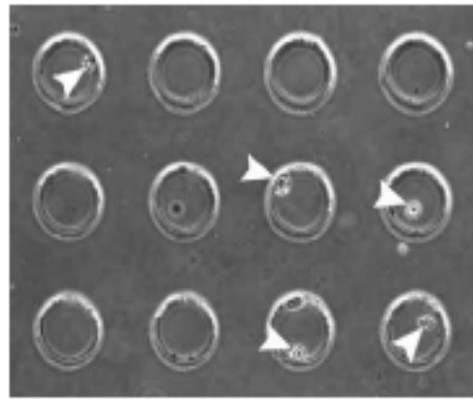
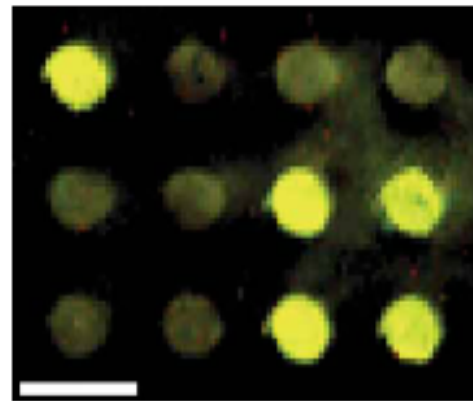
- Expensive to produce
- Large time-scale necessary in order to isolate hybridomas
- Current method: limiting serial dilution
 - Does not allow for high throughput analysis of secreted antibodies, or recovery of cells for clonal expansion

Microengraving method

- Created an array of microwells using photolithography and replica molding
 - Wells were 50/100 μm in diameter and depth
 - Array was made of PDMS, a biocompatible material
- Cells were deposited on surface
- Excess was removed
- # of cells dependent on concentration of cells, volume applied, time, size of wells, and size of slab
- Achieved 1-3 cells in 50-75 % of the wells
- Array is placed on top of a solid support (pre-treated).





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Significance

- Can detect rare or slow-growing clones due to early cell isolation
- Can perform screens with multiple antigens
- Makes possible automation of monoclonal antibody production