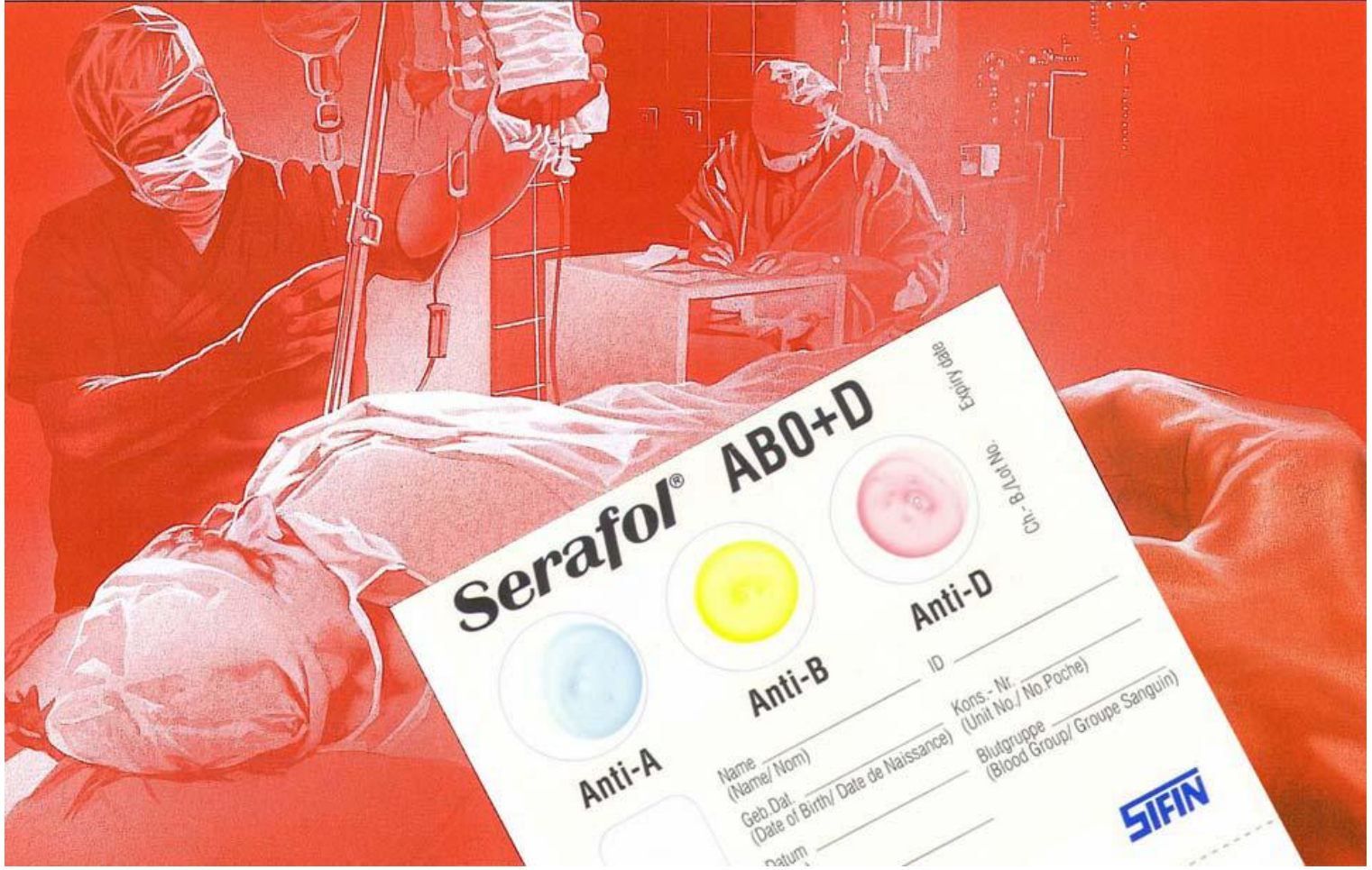


ME 498 / ME 599

Biological Frameworks for Engineers

ME 498 / ME 599

“Lab on Chip” Lab



Method

**Reliable diagnosis
in 2 minutes**

Test procedure

Place one drop of isotonic saline solution on each reaction field and auto-control field.



Add one drop of the recipient's blood to each field in the upper panel of the card and one drop of donor blood to each field in the lower panel of the card.



Stir each field with an applicator stick for approx. 30 seconds. The reagents must dissolve completely.



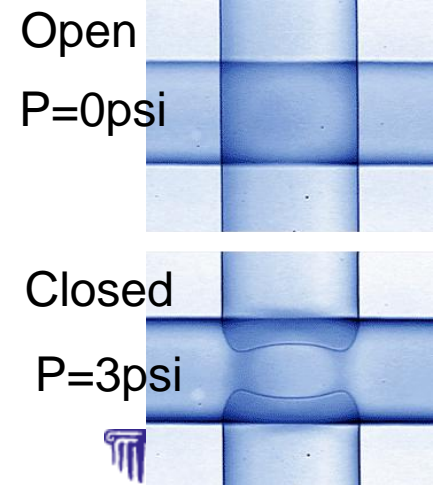
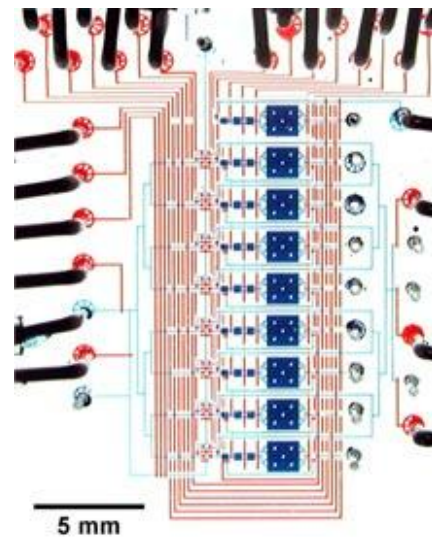
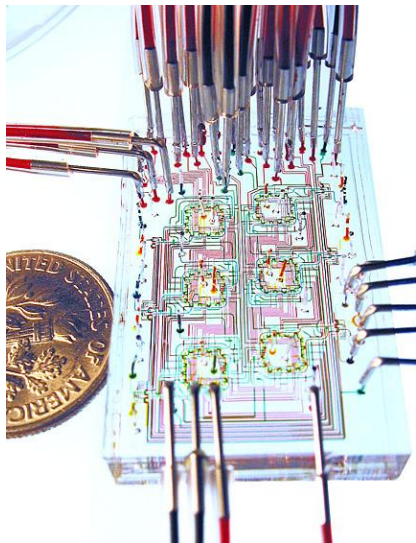
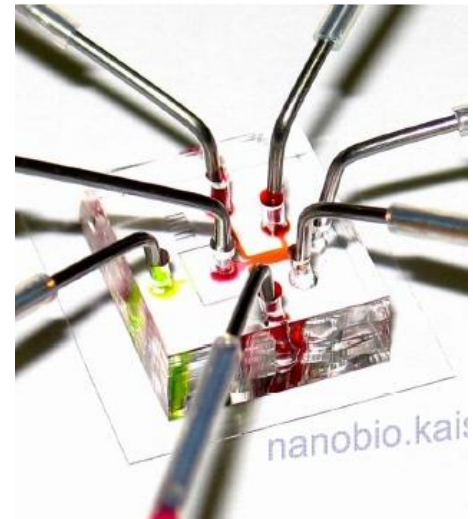
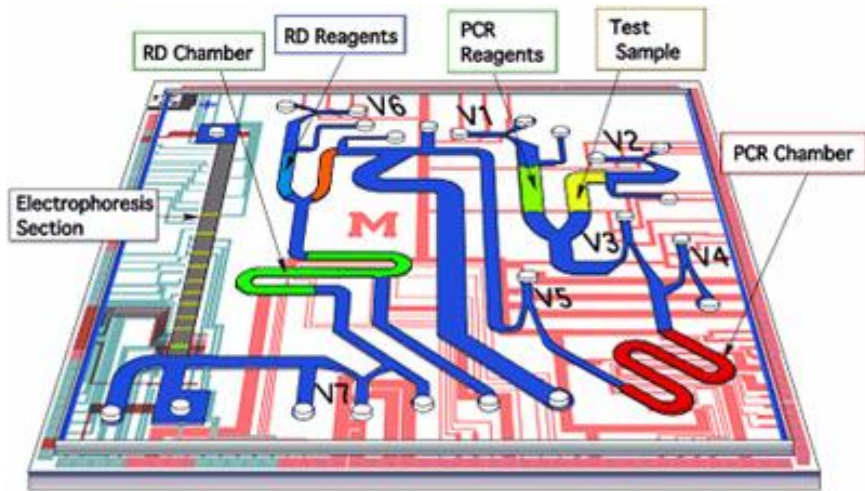
Gently rock the card back and forth for approx. 30 to 60 seconds, then check each field for agglutination.



Dry the reaction mixtures and cover with self-adhesive film before filing the card.

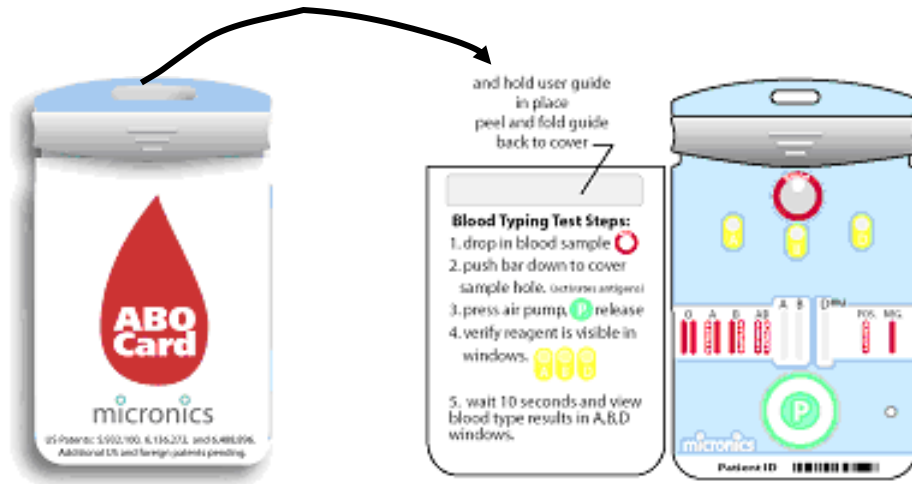


Lab on Chip



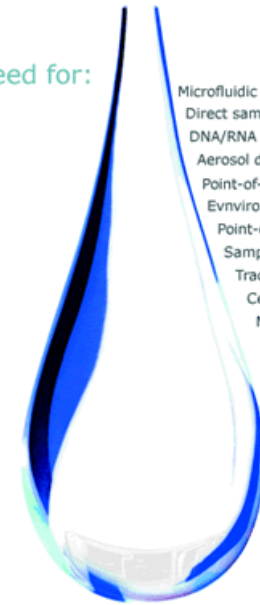
ABO Card

- Simple, portable, rapid diagnostics



all you need for:

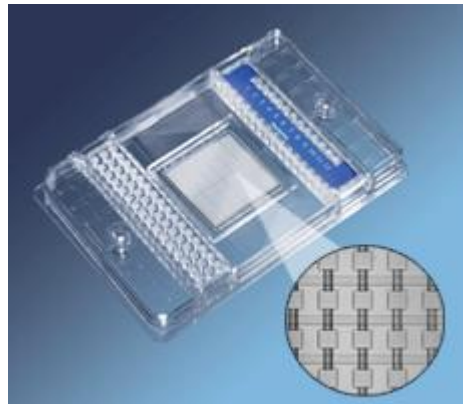
- Microfluidic lab cards (application specific)
- Direct sample testing on card
- DNA/RNA analysis
- Aerosol detection
- Point-of-use viral detection
- Environmental sampling and analysis
- Point-of-use bacteriological detection
- Sample, reagent and waste containment
- Trace mineral testing
- Cell count analysis
- Micro to macro interface



BioMark™ (Fluidigm®)

Absolute quantification of specific nucleic-acid sequences

- Consists of integrated channels, chambers, and valves
- Automatic dilution: partition mixtures of sample and PCR reagents into 765 nano-volume reactions
- Single copies of the target sequence can be isolated and detected with absolute reliability.



“Lab on Chip” Lab

Introduction

- The purpose of this exercise is to familiarize you with microfluidics devices, antibodies, antigens, and genetic heredity pertaining to blood.
- Use Micronics Inc.'s (Redmond, WA) *ABO Card*, a prototype lab-on-chip card
- Volunteers will take a small drop of blood and load it into the *ABO Card* to identify what antigens are present.
- Blood can harbor blood-borne pathogens, and so we MUST use universal precautions to prevent infection.

Universal Precautions

- Medical history and examination cannot reliably identify whether someone is infected with HIV or other blood-borne pathogens,
- Blood and body-fluid precautions will be used for ALL students and instructors. Consider all blood as potentially infectious.
- Use appropriate barrier precautions to prevent skin and mucous-membrane exposure. These items are to be **worn at all times**.



Transmission Risk of BBP

- Risk of infection depends on several factors:



- Pathogen involved
- Type/route of exposure
- Amount of virus in infected blood during exposure
- Amount of infected blood involved in the exposure
- If post-exposure treatment was taken
- Specific immune response of infected individual

Let's begin!