Biological Frameworks for Engineers

ME 411 / ME 511

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UNIVERSITY OF WASHINGTON

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"Lab on Chip" Lab

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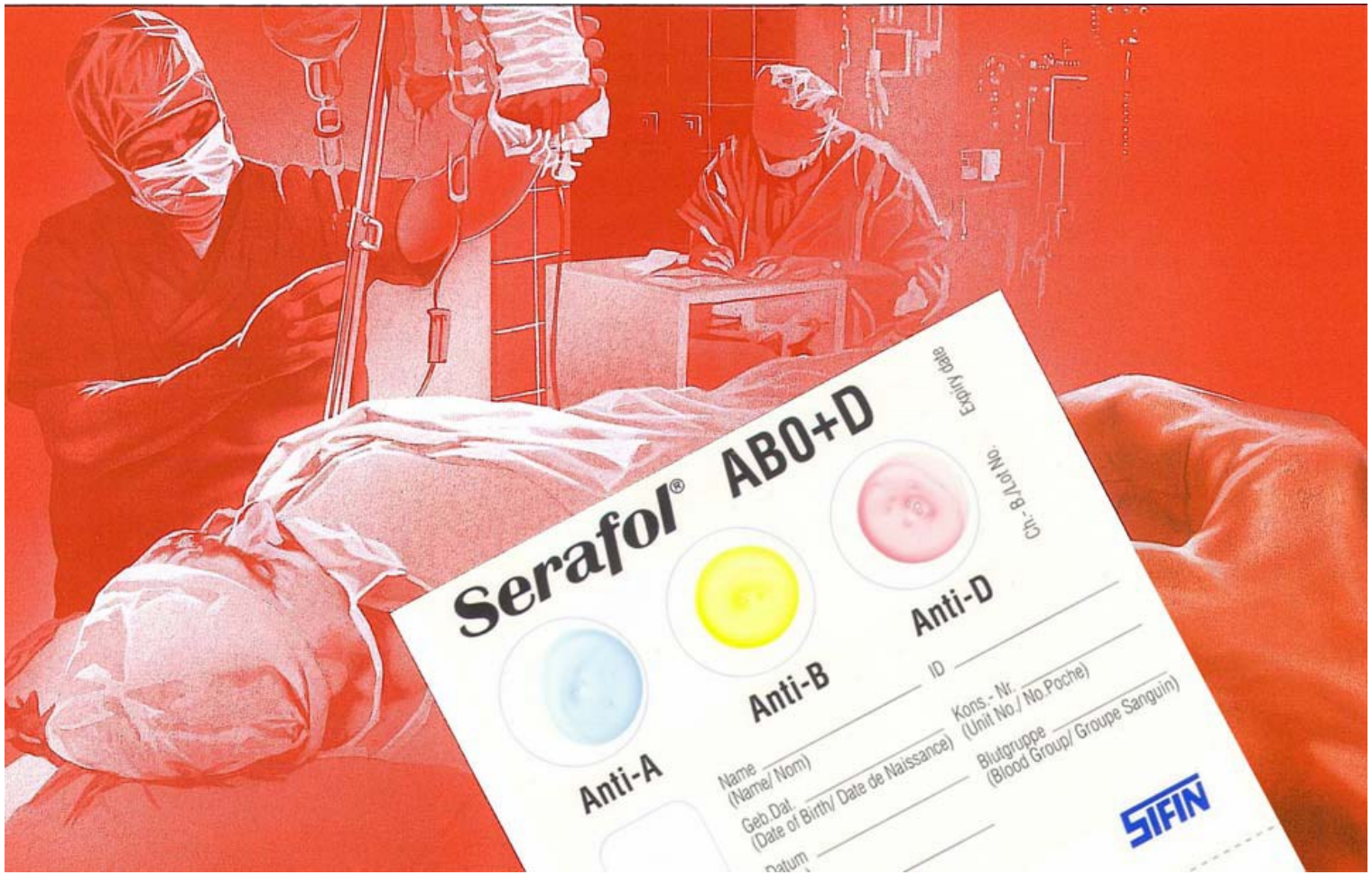

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Method

Reliable diagnosis in 2 minutes

Test procedure

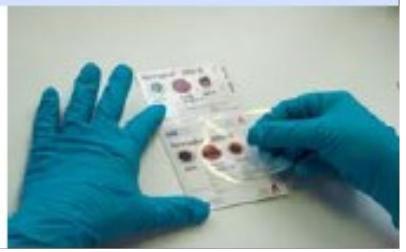
Place one drop of isotonic saline solution on each reaction field and auto-control field.

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.

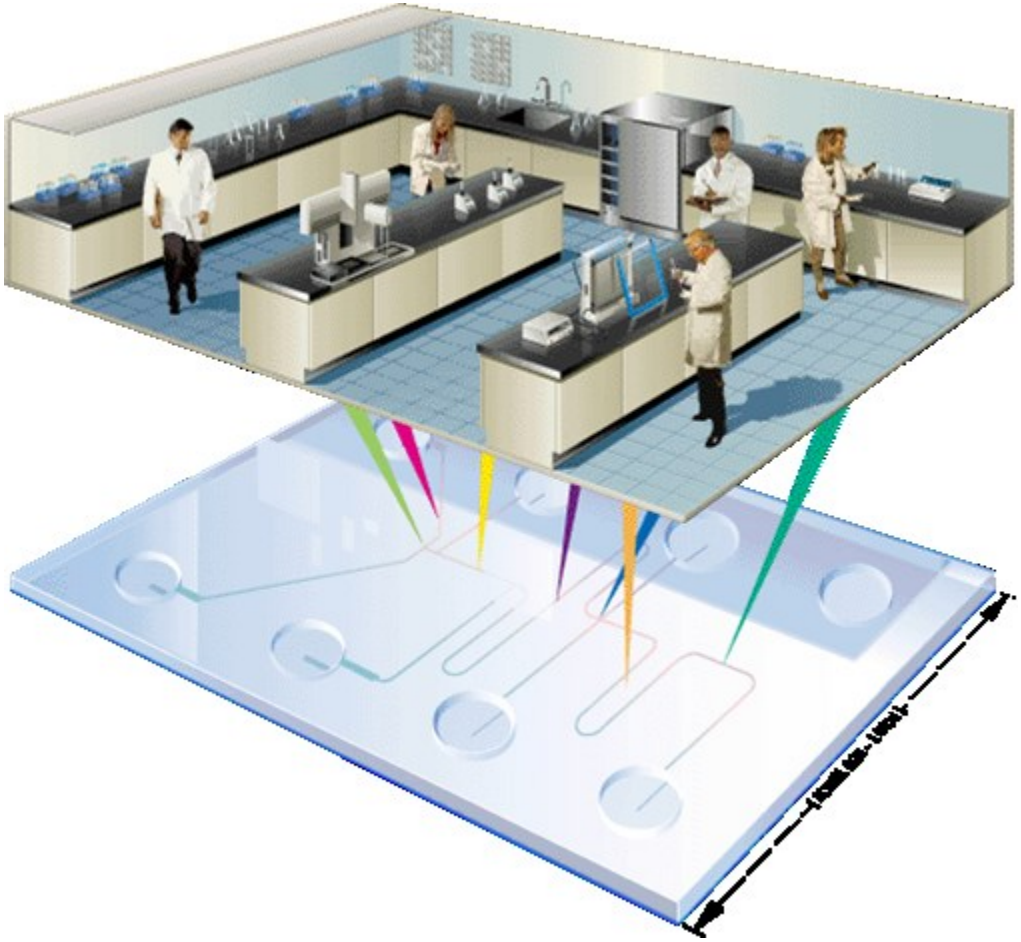
Stir each field with an applicator stick for approx. 30 seconds. The reagents must dissolve completely.

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.

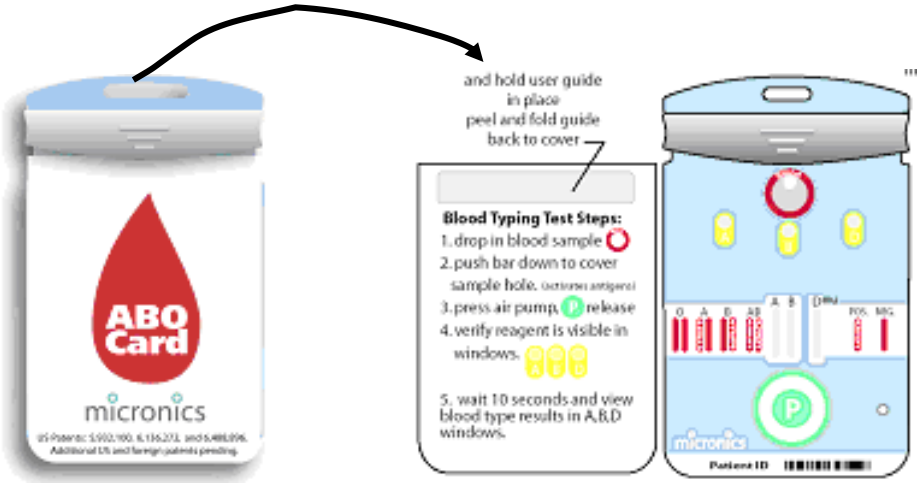


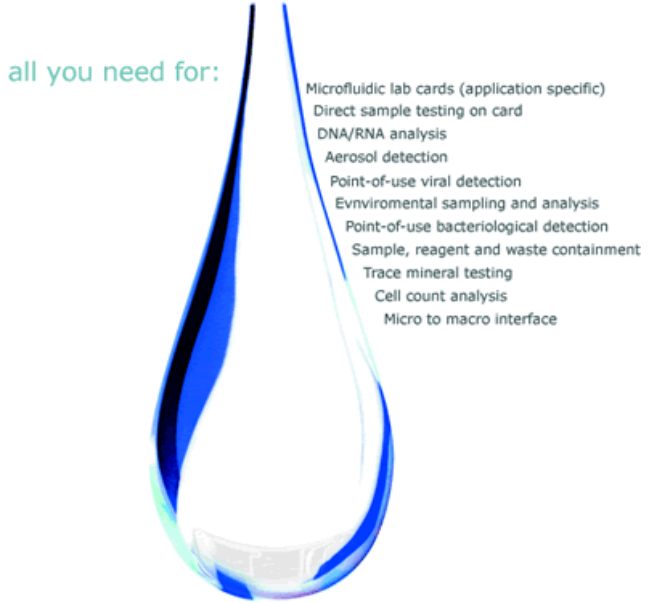
Lab on Chip



ABO Card

- Simple, portable, rapid diagnostics





micronics
all you need from sample to solution

“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.

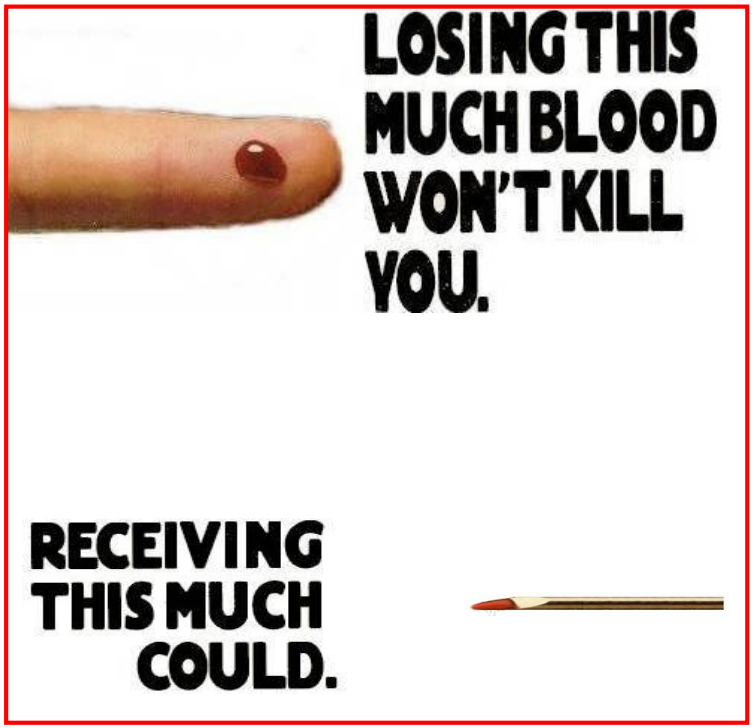
Universal Precautions

- 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

Courtesy of Owen Mumford, Inc.

Operation

- http://youtu.be/KFbcJRNNH2g

Let's begin!