



**Advanced laboratory
technique**

**Lab/ 2
Immunochemistry**

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INTRODUCTION:

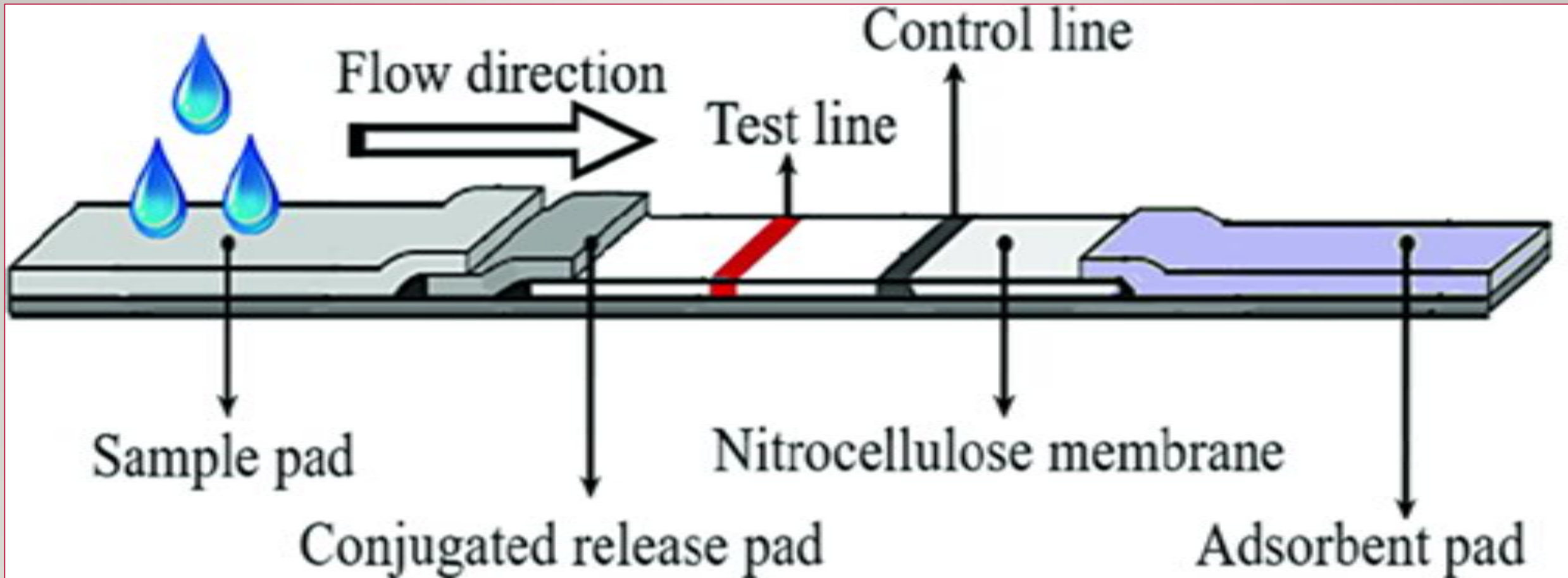
- ❑ Immunochromatography, also known as a lateral flow immunoassay or rapid test, is a widely used diagnostic technique. It allows for the rapid and qualitative detection of specific target substances, such as antigens or antibodies, in various biological samples like blood, urine.
- ❑ This is a speedy and simple technique that produces diagnostic results in 10 to 15 minutes after dropping the sample.
- ❑ An allergic reaction indicating a positive test result appears as a colored line.



BASIC COMPONENTS OF LATERAL FLOW TEST:

- 1) **Sample Pad:** This is where the sample is applied. It absorbs and conditions the sample, often containing buffer salts and surfactants to ensure the sample is compatible with the test.
- 2) **Conjugate Pad:** This pad holds the detector particles, typically labeled antibodies or antigens, which bind to the target analyte in the sample.
- 3) **Nitrocellulose Membrane:** This membrane contains the test and control lines. The test line captures the target analyte-detector complex, producing a visible signal if the target is present. The control line confirms that the test has worked correctly.
- 4) **Absorbent Pad:** Also known as the wick or waste pad, this component absorbs excess sample and ensures continuous flow through the test strip.

BASIC COMPONENTS OF LATERAL FLOW TEST:



PRINCIPLE OF IMMUNOCHROMATOGRAPHY:

□ The principle of immunochromatography, also known as lateral flow immunoassay, is based on the specific interaction between an antigen and its corresponding antibody.

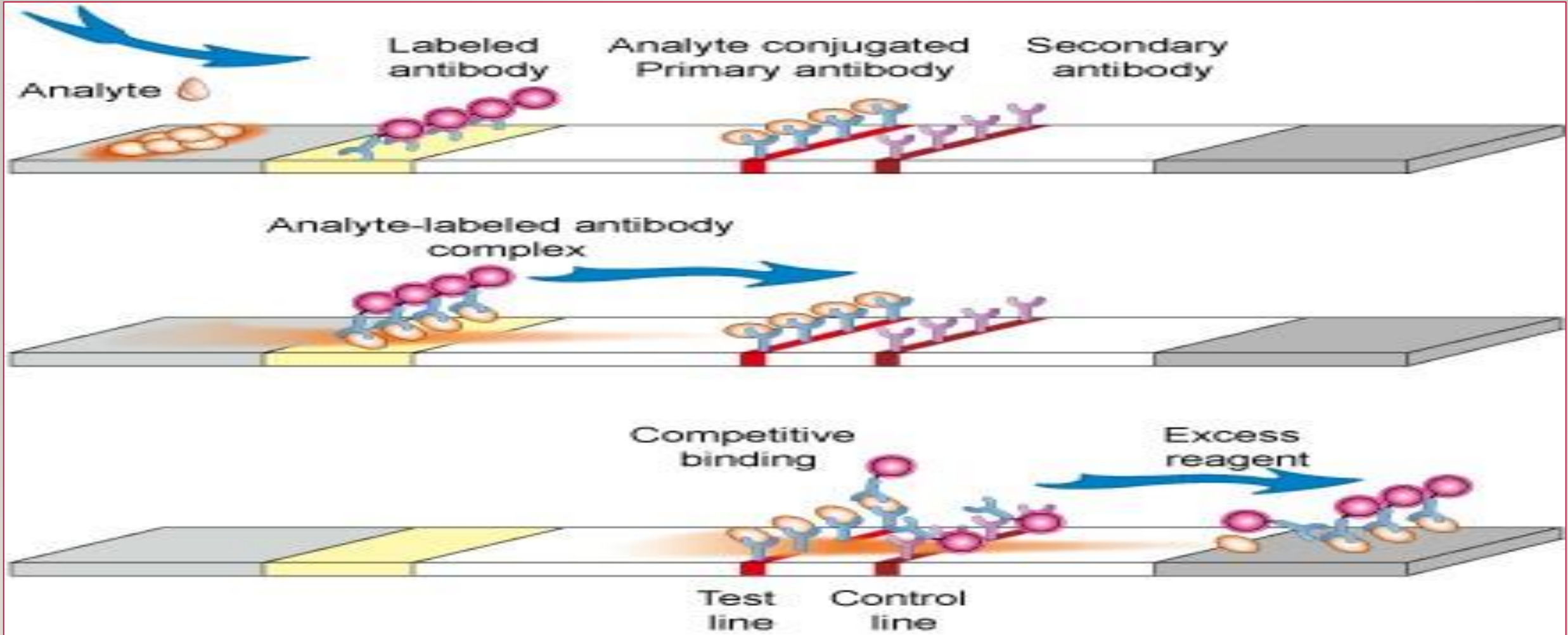
□ Principle:

- 1) **Sample Application:** The biological sample (e.g., blood, urine) is applied to the sample pad of the test strip.
- 2) **Conjugate Pad:** The strip contains a pad with colored particles (like gold nanoparticles or latex beads) coated with specific antibodies or antigens.
- 3) **Migration:** The sample and conjugate particles move along the strip by capillary action.

PRINCIPLE OF IMMUNOCHROMATOGRAPHY:

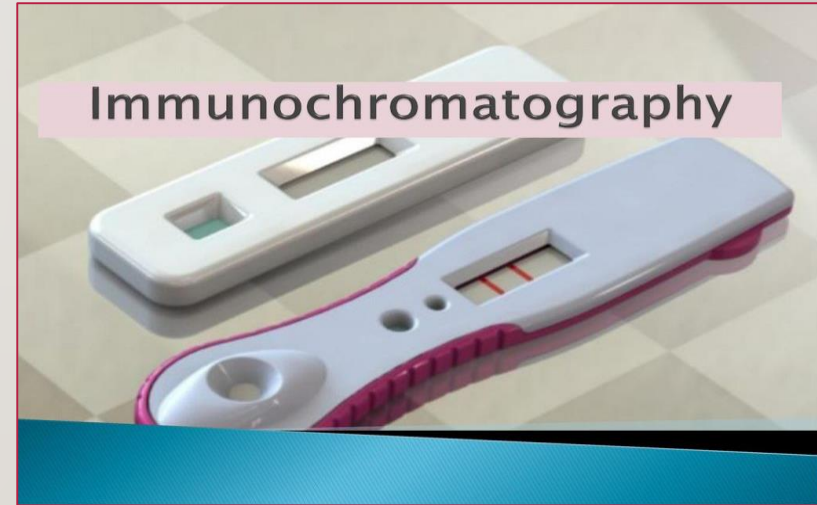
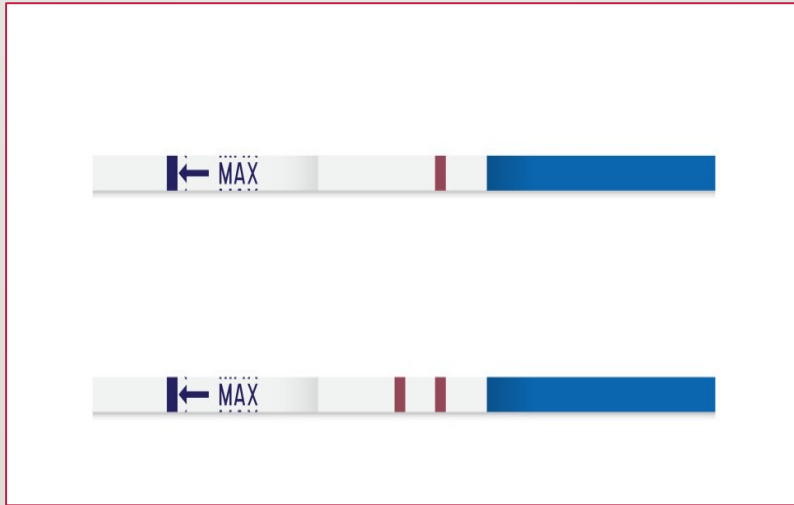
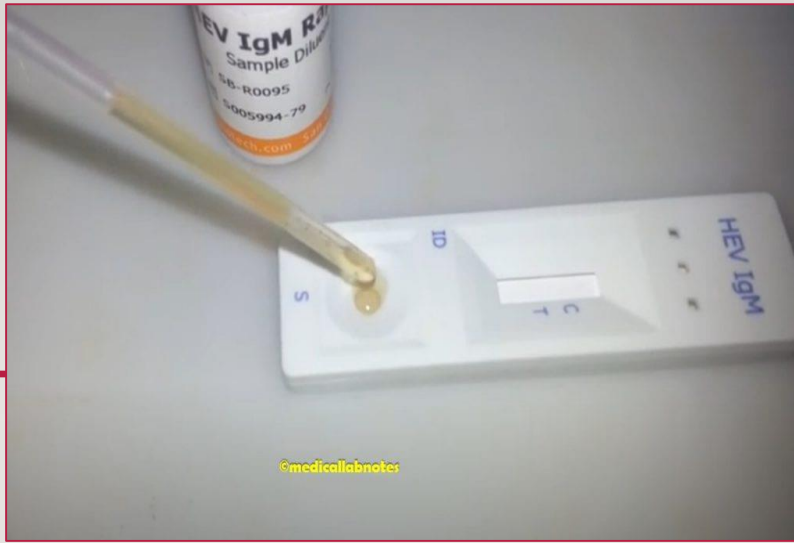
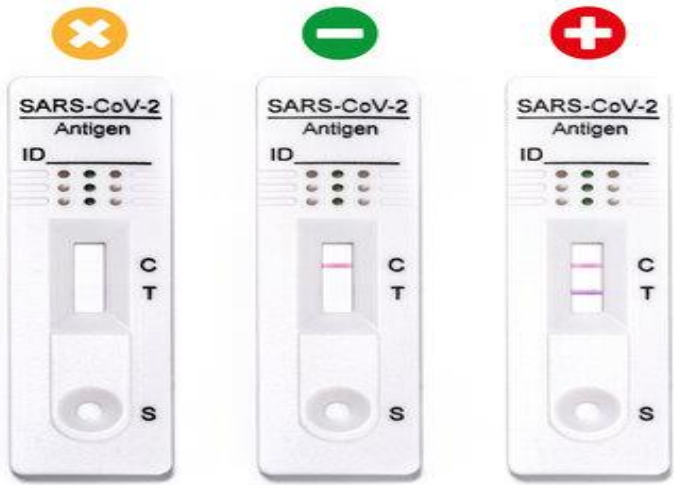
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- 4) **Reaction at Test Line:** The strip has a test line with immobilized antibodies or antigens. If the target substance is present, it binds here.
 - 5) **Visible Result:** This binding forms a visible colored line, indicating a positive result.
- ❑ **How It Works:**
- **Antigen Detection:** For detecting antigens, the test line contains immobilized antibodies specific to the antigen. When the sample containing the antigen reaches this line, it binds to the antibodies, forming a visible line.
 - **Antibody Detection:** For detecting antibodies, the test line contains immobilized antigens. When the sample containing the antibodies reaches this line, it binds to the antigens, forming a visible line.

PRINCIPLE OF IMMUNOCHROMATOGRAPHY:



BENEFITS OF LATERAL FLOW TESTING:

1. **Speed:** Provides rapid results, often within minutes.
2. **Simplicity:** Easy to use without the need for specialized laboratory equipment or extensive training.
3. **Cost-Effectiveness:** Generally low-cost compared to other diagnostic methods like ELISA or PCR.
4. **Versatility:** Capable of detecting a wide range of substances, including pathogens and hormones.
5. **Stability:** Long shelf life and stable under various storage conditions.



Thank you

