



محاضرة رقم: 5

¹ Lecture No 5:

Practical

Advanced laboratory technique

COUNTER IMMUNOELECTROPHORESIS (CIE)

Sawa University

College of health and medical techniques

Department of Medical Laboratories

. Stage third

جامعة ساوة الاهلية

كلية التقنيات الصحية والطبية

قسم تقنيات المختبرات الطبية

المرحلة / الثالثة

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Counter Immuno-electrophoresis (CIE)

:Definition

CIE is a rapid immunological test used to detect specific antigens or antibodies in a sample by applying an electric field in agarose gel

Principle: Under an electric current:

- Antigen moves toward the **anode (+)**.
- Antibody moves toward the **cathode (-)**

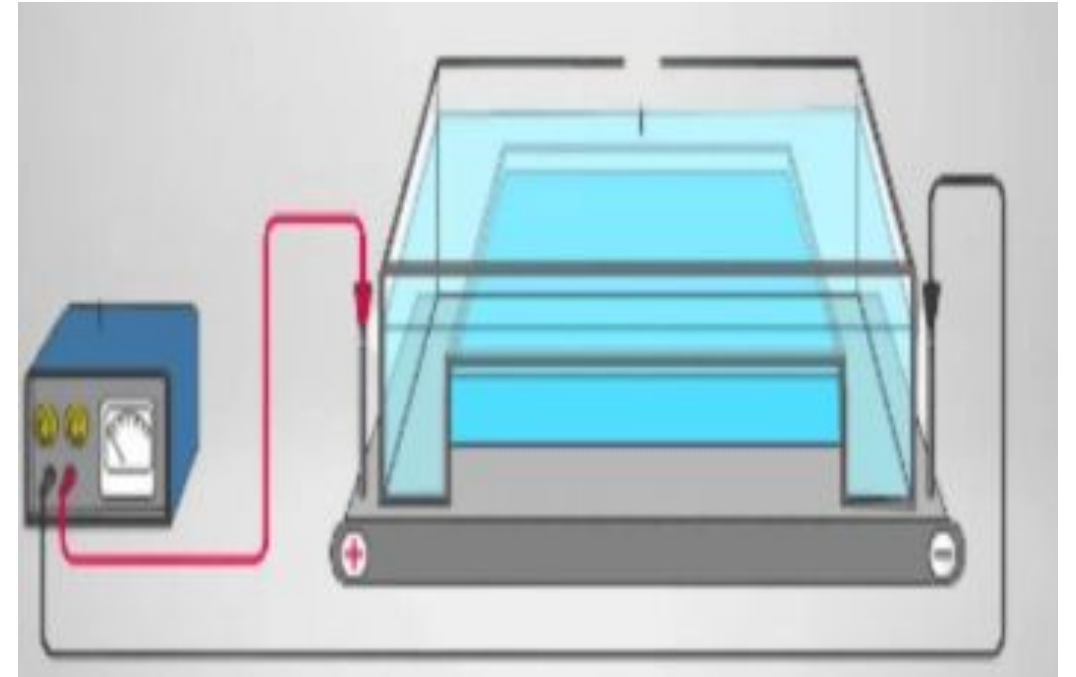
When they **meet** in the gel, they form a **precipitin line**, which indicates a **positive antigen–antibody reaction** .The result appears **within 30–60 minutes**.

Objectives:

- 1.To detect **antibodies** in **antisera** and check their specificity .
- 2.To identify the presence of **antigens or antibodies** for **disease diagnosis**.

Materials

- Agarose
- Antigen
- Test antiserum
- Positive antiserum
- Assay Buffer
- Electrophoresis apparatus
- Glass Slides



Procedure

Prepare **1% agarose** in **1X assay buffer** by heating until completely dissolved.

2. Pour about **5 ml of agarose** onto a **glass slide**, mark its ends as **+ve (anode)** and **-ve (cathode)**, then let it **solidify for 15 minutes**.

3. Cut two wells in the gel about **0.5 cm** apart.

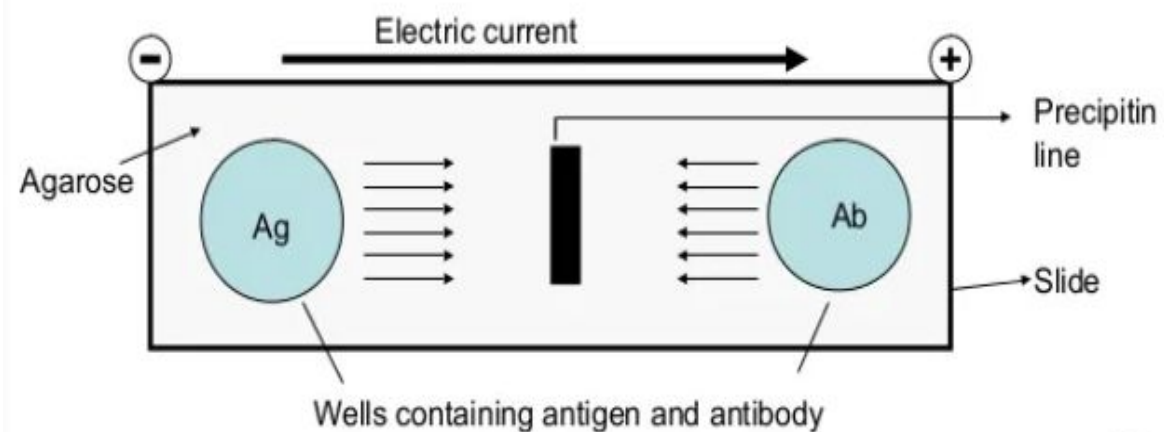
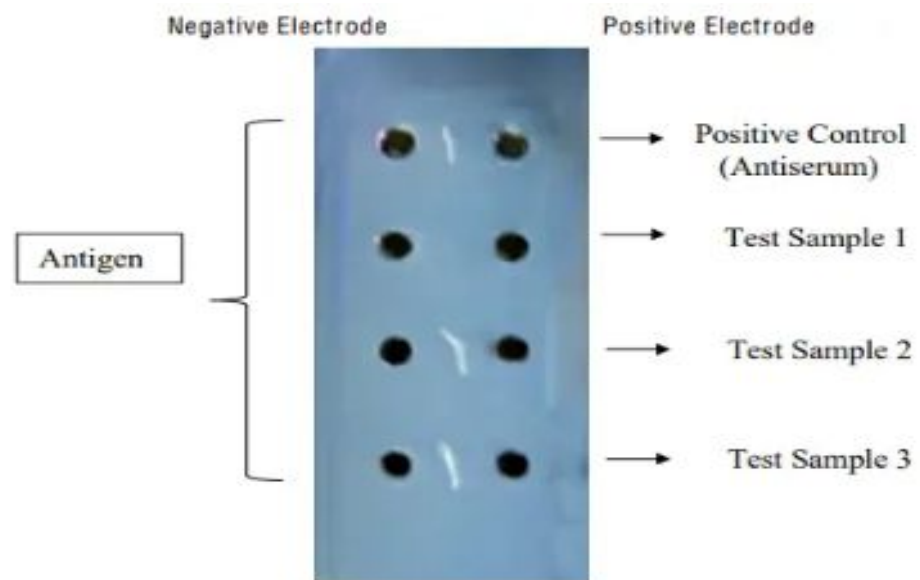
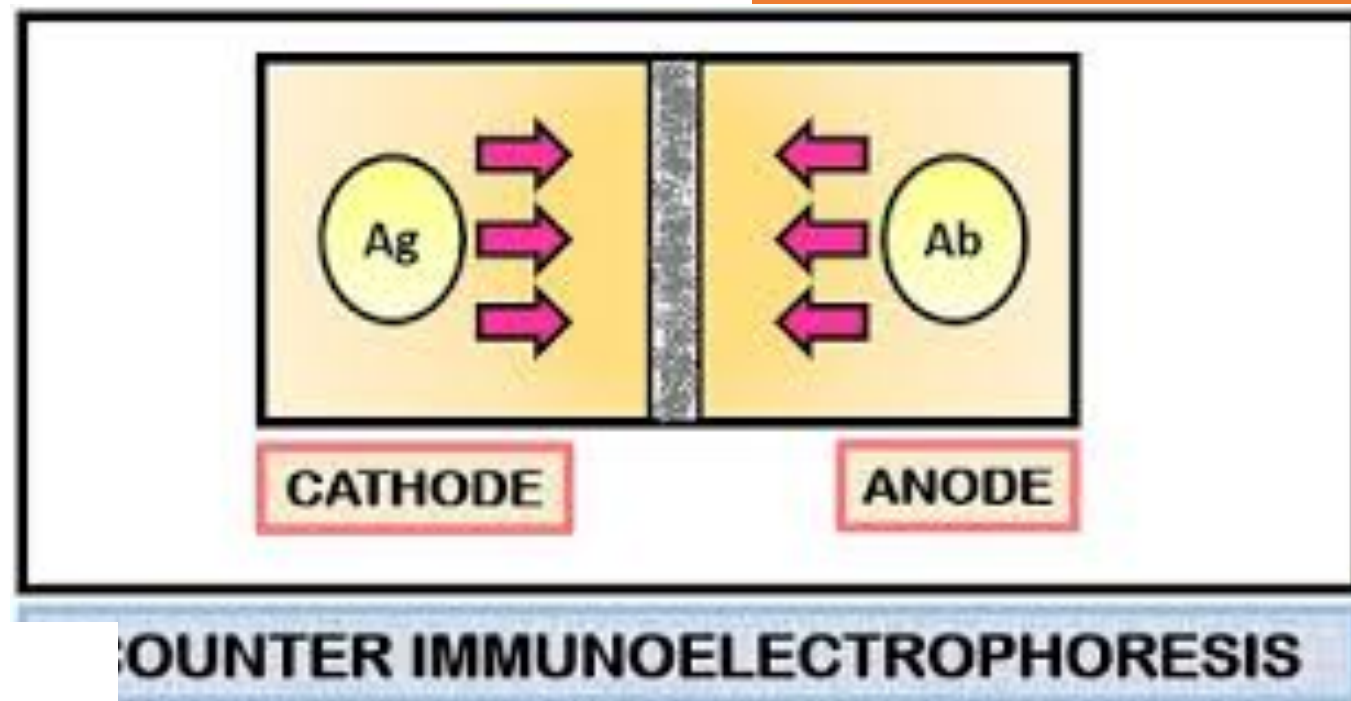
Add **10 µl of antigen** near the **cathode** and **10 µl** of test and **positive antisera** near the anode .

5. Place the slide in the **electrophoresis tank** , cover the gel with **1X buffer**, and apply **50 V** for **45 minutes**.

6. **After the run**, observe the precipitin line between wells to interpret the result .

Results

- **Precipitin line** between the **antigen** and **antisera wells** indicate **positive** reaction or specific antigen-antibody reaction due to the presence of antibody specific to the antigen.
- The **absence** of the **precipitin line** indicates **no reaction** or the **absence** of any corresponding **antibody-antigen**.
- The presence of **more than one** precipitin line indicates the heterogeneity of the antibody for the antigen.



Advantages

- A fast method of antigen-antibody detection (takes 30 minutes)
- More sensitive than electro-immunodiffusion (EID) because it involves simultaneous electrophoresis of the antigen and the antibody in gel in opposite **directions resulting in band formation.**
- Much faster and more sensitive than the double diffusion technique.

Limitations

- It is more expensive than agglutination based tests.
- It is believed to have **decreased sensitivity**, speed, and simplicity, .then **latex agglutination** tests

Any questions?

*Thank
You*