



Massive Open Online Course – Tema Populer

ELISA for COVID-19

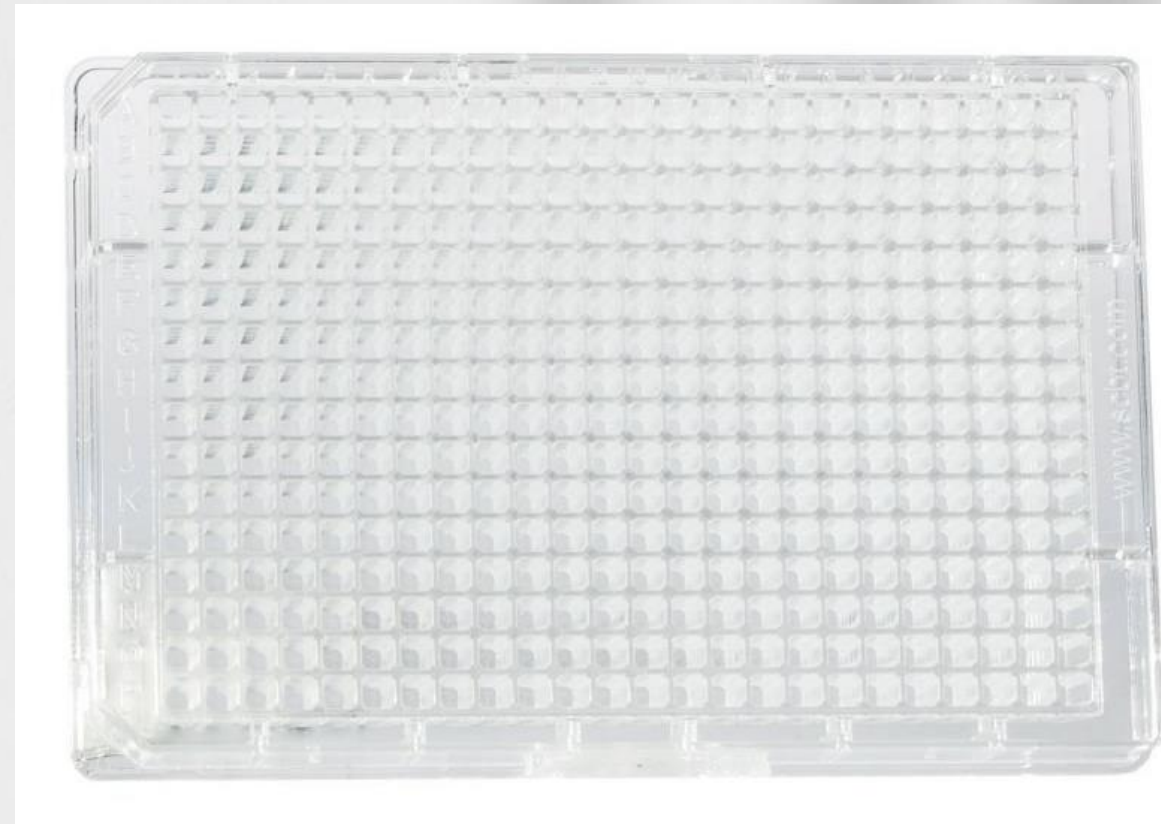
Rizka Oktarianti Ainun Jariah S.Si.,M.Sc

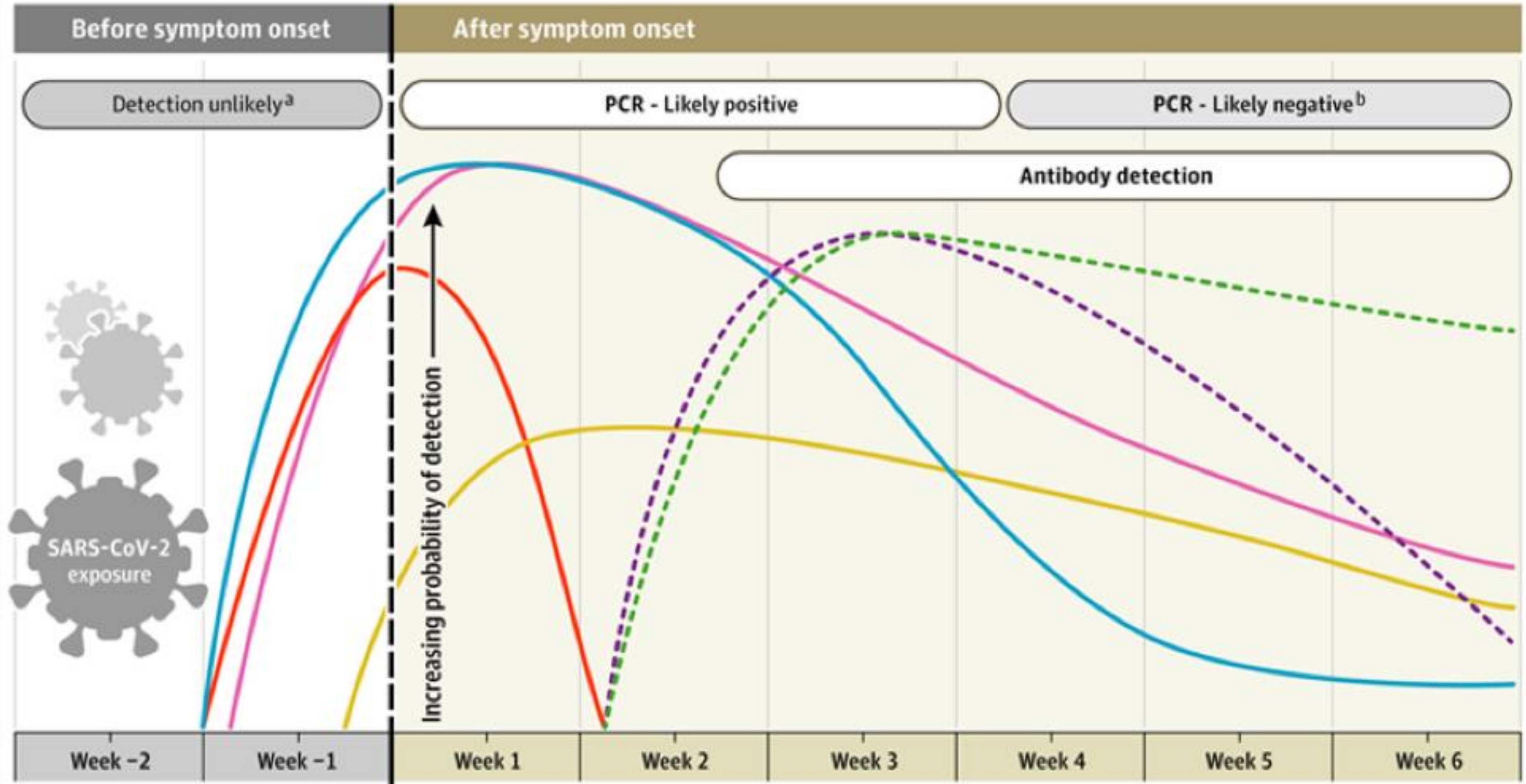
Prodi DIII Teknologi Laboratorium Medis
Universitas Airlangga



ELISA (Enzyme Linked Immunosorbent Assay)

- Immunoassay (serology) techniques based on Ab-Ag interaction
- Plate-based assay technique designed for detecting and quantifying soluble substances such as peptides, **proteins, antibodies, and hormones.**
- For COVID-19 commonly used to quantify antibody





- Nasopharyngeal swab PCR
- Virus isolation from respiratory tract
- Bronchoalveolar lavage/sputum PCR
- Stool PCR
- - - IgM antibody
- - - IgG antibody

Important Note :

- Antibody or serology Test are used to detect **previous infection** with SARS-CoV-2.
- The test might not detect antibodies in someone with a current infection, **depend on the time of infection**
- It is useful for public health surveillance and epidemiologic purposes.
- Because antibody tests can have different targets on the virus, **specific tests** might be needed to assess for antibodies originating from past infection versus those from vaccination

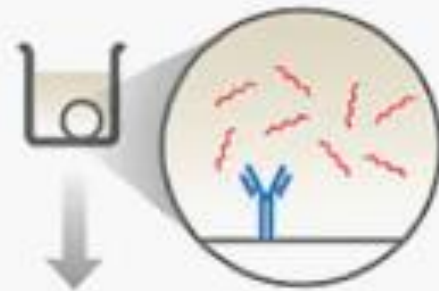
(WHO; CDC 2021)

Standard Procedure of ELISA

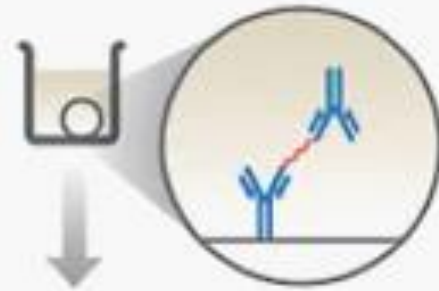
1. **Coating/capture**—direct or indirect immobilization of antigens to the surface of polystyrene microplate wells.
2. **Plate blocking**—addition of irrelevant protein or other molecule to cover all unsaturated surface-binding sites of the microplate wells.
3. **Probing/detection**—incubation with antigen-specific antibodies that affinity-bind to the antigens.
4. **Signal measurement**—detection of the signal generated via the direct or secondary tag on the specific antibody.

- ◊ Most commonly used enzyme labels are **horseradish peroxidase (HRP)** and **alkaline phosphatase (AP)**

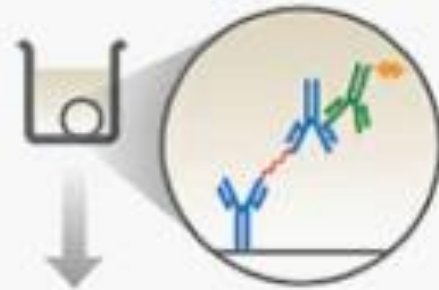
Incubate standard and cell extract
aspirate and wash 4x



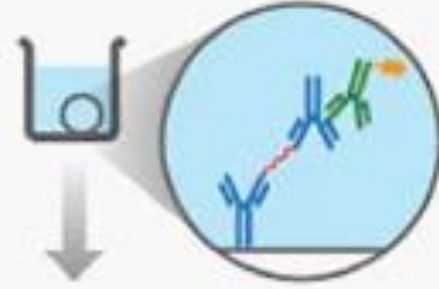
Incubate detection antibody
aspirate and wash 4x



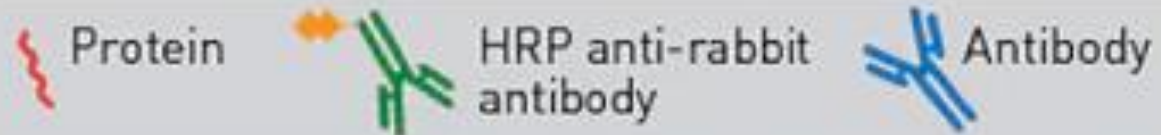
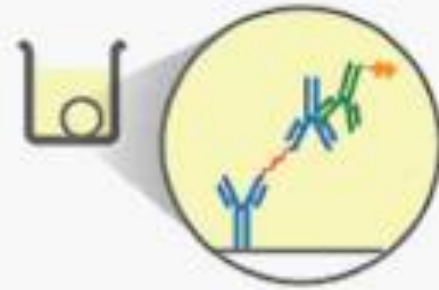
Incubate HRP anti-rabbit antibody
aspirate and wash 4x








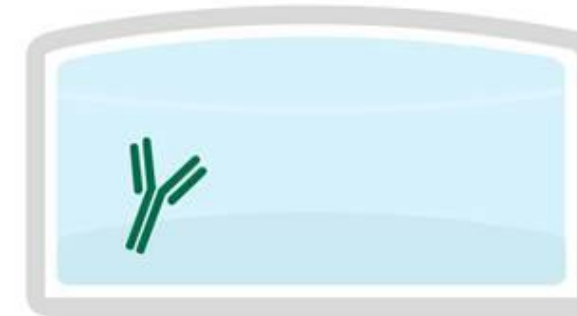
Incubate stabilized chromogen



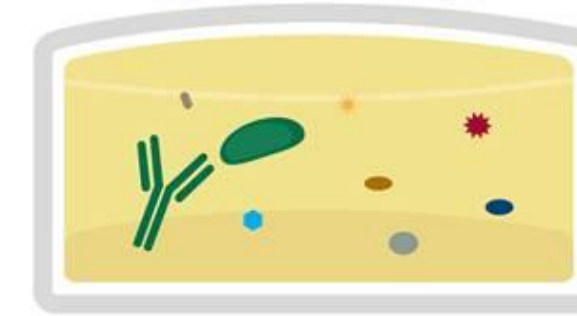
Add stop solution
Read at 450 nm



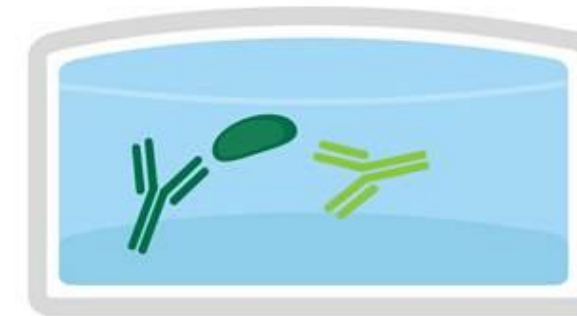
-  Capture Antibody
-  Detector Antibody
-  Detection Conjugate
-  Target Protein
-  Sample matrix Protein



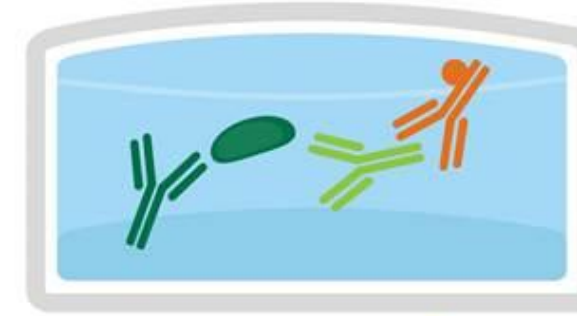
Pre-coated micro-well plate



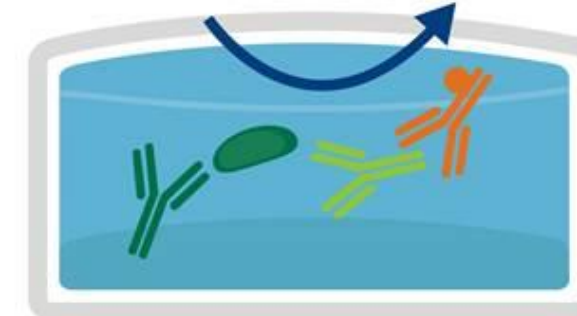
Add sample or standards,
incubate



Sample and standards are
removed, add detector
antibody, incubate, wash



Add detection conjugate,
incubate, wash

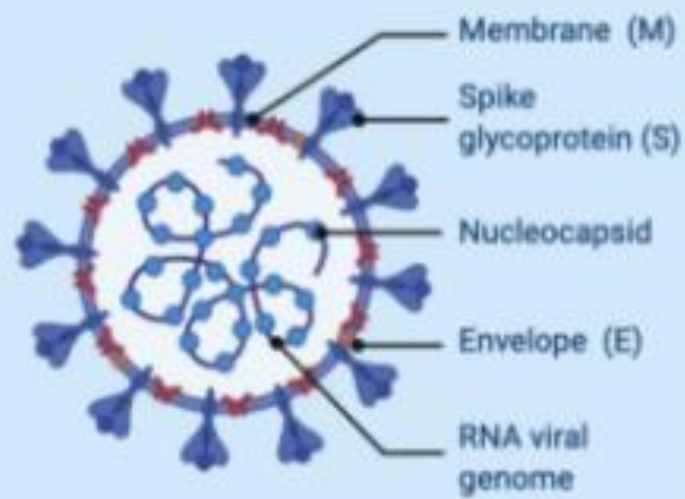


Add detection substrates,
incubate, read at OD 450 nm

COVID-19

Detection

SARS-CoV-2



SEROLOGICAL TEST:



Sample collection



Serum separation

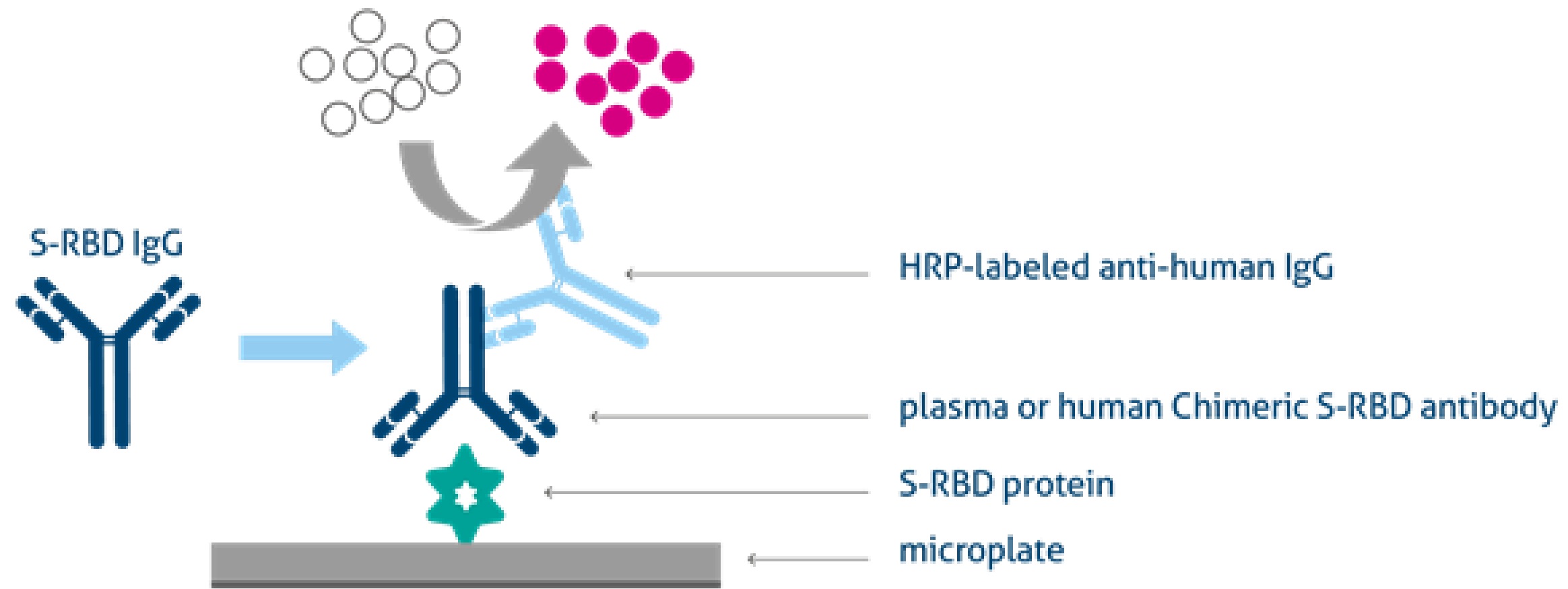


ELISA assay



Antibody detection

KE30003 IgG for SARS-CoV-2 S-RBD kit



ELISA Reaction in SARS-COV – 2 Antibody detection



Thank you !

