

ELISA

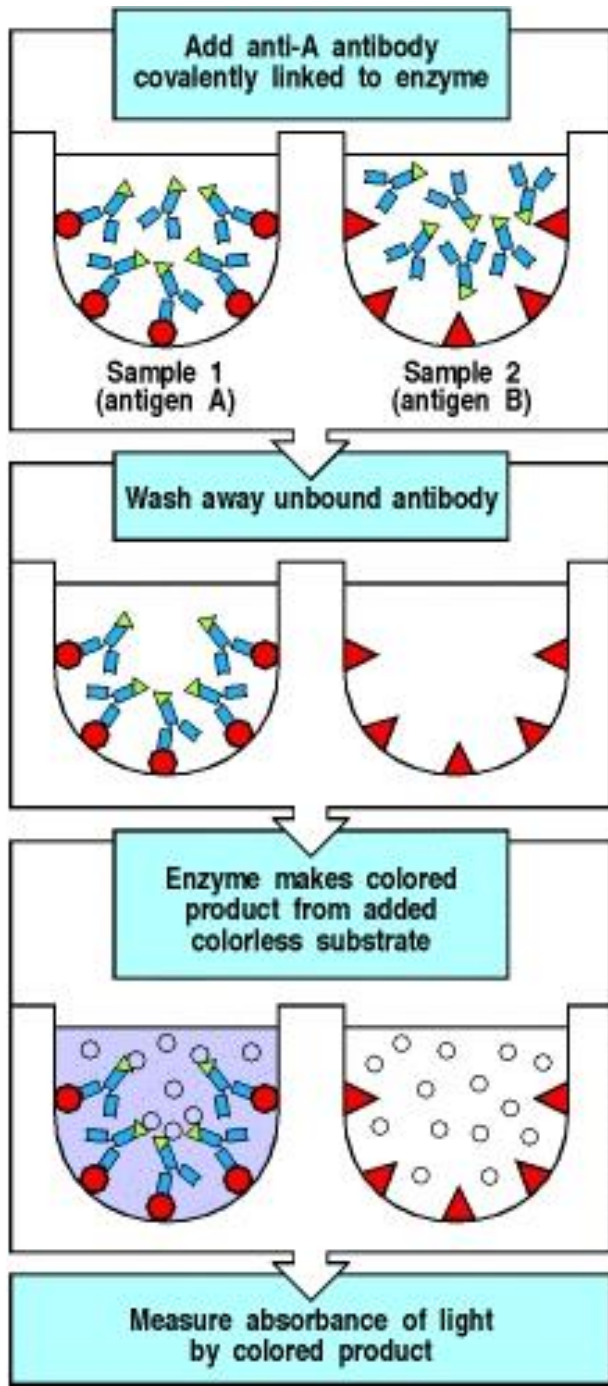
Enzyme Linked Immunospecific Assay

ELISA

- Utilizes Antigen-Antibody Specificity
- Remember Antibodies are shaped like “Y’s” and the tips are the variable region
- Foreign Proteins (antigens) enter your body and your body makes a specific antibody to the antigen
- Immunoglobulin G (IgG) is a group of antibodies
- Often, an enzyme is attached to the antibody; when the binding occurs, the enzyme causes a color change

ELISA cont.

- [http://www.biology.arizona.edu/IMMUNOLOGY/activities/elisa/technique.html?](http://www.biology.arizona.edu/IMMUNOLOGY/activities/elisa/technique.html)
- Definition of direct vs. indirect debated, but animation is great
 - http://highered.mcgraw-hill.com/sites/0072556781/student_view0/chapter33/animation_quiz_1.html



The principle of the enzyme-linked immunosorbent assay (ELISA)

To detect antigen A, purified antibody specific for antigen A is linked chemically to an enzyme. The samples to be tested are coated onto the surface of plastic wells to which they bind nonspecifically; residual sticky sites on the plastic are blocked by adding irrelevant proteins (not shown). The labeled antibody is then added to the wells under conditions where nonspecific binding is prevented, so that only binding to antigen A causes the labeled antibody to be retained on the surface. Unbound labeled antibody is removed from all wells by washing, and bound antibody is detected by an enzyme-dependent color-change reaction. This assay allows arrays of wells known as microtiter plates to be read in fiberoptic multichannel spectrometers, greatly speeding the assay. Modifications of this basic assay allow antibody or antigen in unknown samples to be measured as shown in [Figs A.7](#) and [A.29](#) (see also [Section A-10](#)).

<http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=imm&part=A2395&rendertype=figure&id=A2409>

ELISA—some specifics

- In this class, “indirect” term will be used when 2nd antibody is used
- Antigen → Antibody with enzyme → Enzyme specific substrate added → Color change
- Qualitative or Quantitative (Means?)

ELISA Applications

- **HIV testing**
- **Human chorionic gonadotropin (HCG) hormone (pregnancy testing)**
- **Contamination in samples**
- **Testing for allergens in foods**
- **Mad Cow Disease, SARS, HIV**
- **GMO**
- **Drug and steroid testing**
- **Biodefense**
- **Cancer treatment**

BioRad Teaching Resources

- BioRad ELISA Animation and Two BioRad ELISA PPTs with Agricultural or HIV focus
- Travel to BioRad → Locate Life Science Education → Find Teaching Resources
- <http://www.biorad.com/evportal/evolutionPortal.portal>
 - Choose “Life Science Education”
 - Then Choose “Teaching Resources”