

Hepatitis B is a dumb thief, he always leaves a trace behind him because his antigens fall off everywhere he goes! Mr. Immune on the other hand is a first class detective, he knocks all the bad guys down with his antibodies. **Now baby steps guys...** If the trace was found, the thief definitely is (right now) OR was (before) present in the crime scene, right? And if the detective is present at the crime scene after someone called 911, it means that he is (right now) and will be (in the future) looking for a bad guy to shoot!

After investigation, we confirmed that Mr. Hepatitis B is the thief, Mr. Immune found the following evidence:

Mr. Hepatitis B **surface antigen** – Shortened to HBsAg.

Mr. Hepatitis B **core antigen** – Shortened to HBcAg. (He hides it inside liver cells!)

Mr. Hepatitis B **envelope antigen** – Shortened to HBeAg.

And to make sure that Mr. Hepatitis B doesn't do it again, Mr. Immune hired some special agents to stalk him 24/7, they are:

Special agent Hepatitis B **surface antibody** – Shortened to Anti-HBs.

Special agent Total Hepatitis B **core antibody** – Shortened to Anti-HBc.

Special agent **IgM antibody to Hepatitis B core antigen** – Shortened to IgM anti-HBc.

(Note that he hired two agents to stalk the core antigen because he knows it's hidden)

Special agent Hepatitis B **envelope antibody** – Shortened to HBeAb or Anti-HBe.

Let's get into the real deal and learn some basics on each one of the antigens and antibodies, what they look like, when do they get activated and what do they mean...

1. Hepatitis B surface antigen – Shortened to HBsAg:

What is it?

A protein on the surface of the virus.

When is it detected (positive in the serology test)?

During acute or chronic Hepatitis B infection.

What does it indicate (mean)?

The person is infectious.

2. Hepatitis B surface antibody – Shortened to Anti-HBs:

What is it?

An antibody produced by the immune system to attack HBsAg.

When is it detected (positive in the serology test)?

After exposure to Hepatitis B.

What does it indicate (mean)?

The person has recovered from and has immunity to Hepatitis B. It also develops in a person who has been successfully vaccinated against Hepatitis B.

3. Hepatitis B core antigen – Shortened to HBcAg:

What is it?

A Hepatitis B viral protein.

When is it detected (positive in the serology test)?

Cannot be detected in the serum because it is intracellular (within hepatocytes).

What does it indicate (mean)?

The person is infectious.

4. Total Hepatitis B core antibody – Shortened to Anti-HBc:

What is it?

An antibody produced by the immune system to attack HBcAg.

When is it detected (positive in the serology test)?

At the onset of symptoms in acute Hepatitis B and it stays in the body for life.

What does it indicate (mean)?

Previous or ongoing infection with Hepatitis B in an unknown period of time.

5. IgM antibody to Hepatitis B core antigen – Shortened to IgM anti-HBc:

What is it?

IgM produced by the immune system to attack HBcAg.

When is it detected (positive in the serology test)?

At the onset of symptoms in acute Hepatitis B.

What does it indicate (mean)?

Recent, acute infection with the virus.

6. Hepatitis B envelope antigen – Shortened to HBeAg:

What is it?

A Hepatitis B viral protein.

When is it detected (positive in the serology test)?

During acute and chronic Hepatitis B infection.

What does it indicate (mean)?

The virus is replicating and the infected person has high levels of it.

7. Hepatitis B envelope antibody – Shortened to HBeAb or Anti-HBe:

What is it?

An antibody produced temporarily by the immune system to attack HBcAg.

When is it detected (positive in the serology test)?

During acute HBV infection or consistently during or after a burst in viral replication.

What does it indicate (mean)?

A person who converts from positive HBeAg to HBeAB is more likely to achieve long-term clearance of the virus.