# Coagulase Encyclopedia Article

## Coagulase

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# Coagulase

Coagulase is an enzyme that is produced by some types of **bacteria**. The enzyme clots the plasma component of the blood. The only significant disease-causing bacteria of humans that produces coagulase is *Staphylococcus aureus*.

In the human host, the action of coagulase produces clotting of the plasma in the immediate vicinity of the bacterium. The resulting increased effective diameter of the bacterium makes it difficult for the defense reactions of the host to deal with the infecting cell. In particular, the defensive mechanism of **phagocytosis**, where the bacterium is engulfed by a host cell and then dissolved, is rendered ineffective. This enables the bacterium to persist in the presence of a host immune response, which can lead to the establishment of n infection. Thus, coagulase can be described as a disease-causing (or virulence) factor of *Staphylococcus aureus*

A test for the presence of active coagulase distinguishes the aureus Staphylococcus from the non-aureus **Staphylococci**. *Staphylococcus aureus* is one of the major causes of hospital-acquired infection. **Antibiotic resistance** of this strain is a major concern. In the non-aureus, coagulase-negative group, *Staphylococcus epidermidis* is a particular concern. This strain is also an important disease-causing organism in hospital settings and can establish infections on artificial devices inserted into the body. The ability to quickly and simply differentiate the two different types of *Staphylococcus* from each other enables the proper treatment to be started before the infections become worse.

In the test, the sample is added to rabbit plasma and held at 37° C for a specified period of time, usually bout 12 hours. A positive test is the formation of a visible clump, which is the clotted plasma. Samples must be observed for clotting within 24 hours. This is because some strains that produce coagulase also produce an enzyme called fibrinolysin, which can dissolve the clot. Therefore, the absence of a clot after 24 hours is no guarantee that a clot never formed. The formation of a clot by 12 hours and the subsequent disappearance of the clot by 24 hours could produce a so-called false negative if the test were only observed at the 24-hour time.