



Staphylococcus aureus is a gram positive cocci (round) bacteria that is of particular importance in the pharmaceutical and healthcare industry.

The name “aureus” is the Latin for “gold” as the bacteria produces shiny golden colonies on nutrient agars. *S. aureus* is a prevalent skin organism with an estimated 25% of people being long-term carriers. Due to its presence on the skin, it can be a major cause of contamination of pharmaceutical product due to improper handling or poor aseptic technique. Certain strains of *S. aureus* are a particular problem in healthcare as they have developed antibiotic resistance. MRSA or Methicillin-Resistant *Staphylococcus aureus* has developed resistance to mainstream Beta-lactam antibiotics which includes the majority of penicillin derived compounds such as methicillin.



Staphylococcus aureus colonies on Tryptone Soya Agar (TSA)¹⁾

S. aureus is a facultative anaerobe which means that it is able to produce energy in the form of ATP, through aerobic respiration or fermentation when oxygen levels are low. Identifying *S. aureus* in the lab can be done by employing a series of biochemical tests. *S. aureus* produces the enzyme catalase which metabolises hydrogen peroxide, an oxidative compound, into water and oxygen. This catalase test

is important as it is used to distinguish *S. aureus* from other morphologically similar bacteria such as *Streptococcus*. Identifying an organism correctly can be particularly important for determining patient treatment. In addition, the majority of *S. aureus* strains are coagulase positive, i.e. can cause blood clotting. If a *Staphylococcus* is coagulase negative, *S. aureus* infection can usually be ruled out. Not all strains of *S. aureus* are coagulase positive.

From a pharmaceutical perspective, isolating and identifying a *Staphylococcus spp.* can be useful during root cause analysis. Consistently high TVC's in product or water samples where the primary isolate is a *Staphylococcus spp.* is indicative of bad practice by operators. Whilst *S. aureus* is a commonly found commensal organism and usually harmless on the skin, once it is introduced into the bloodstream it can cause life threatening illness. *S. aureus* is a major cause of sepsis when introduced into the body via implants, surgical incisions and injectable medicines. As a result, pharmaceutical systems and monitoring should be designed to prevent and detect any contamination. Remedial action for consistent contamination with a skin organism such as *S. aureus* typically involves retraining operators to improve aseptic technique or additional process improvement, to reduce human involvement or contact.

At Honeyman we provide TVC and identification services for pharmaceutical products, raw materials, water and environmental monitoring. Our Consultant Microbiologists, with decades of industry experience, are on hand to support your out-of-specification investigations and remedial actions.

Contact us today to see how we can help.

Tel: +44(0)1833 690101

¹⁾ Source https://en.wikipedia.org/wiki/Staphylococcus_aureus