Detecting bacteria from blood in blood poisoning

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One of the diseases detectable by looking for microbes in blood is blood poisoning, also called sepsis. In sepsis microbes, most commonly bacteria, invade the body and cause a body-wide inflammation, leading ultimately to organ failure and death. Blood poisoning is a serious condition and one of the most common causes of death both in hospitals and overall. Detecting blood poisoning is difficult, since at the beginning its symptoms resemble those of many other diseases.

Detecting blood poisoning and identifying the microbe that causes it is, however, important, since the probability of death in blood poisoning rises very quickly as the disease advances, and using antibiotics that kill many types of bacteria can lead to the evolving of bacteria resistant to antibiotics. Because of this, this study was part of a project that aims at developing a fast detection and identification method for bacteria in blood poisoning.

It is important to avoid the components of blood disturbing the detection when seeking the bacteria causing a disease from blood. In this study it was noted that when diluted sufficiently, blood, red blood cells, and blood plasma did not cause disturbances. To reach sufficiently small amounts of cells, red blood cells could be removed from blood without removing the bacteria at the same time. This was done with a technique called acoustophoresis, in which the blood cells were directed with ultrasound to separate them from the rest of the blood and bacteria. Bacteria were detected from their genetic code, DNA.