hemotune

Restoring immune balance in sepsis
Despite all progress in medicine, sepsis is still one of the Top 10 leading causes of death and is associated with mortality rates above 30%.

Sepsis (blood poisoning) is a life-threatening organ dysfunction caused by a dysregulated immune response to infection. Currently there are 19 million cases of severe sepsis with more than 5 million deaths every year. Moreover, sepsis is the single most expensive condition in hospitals.

After many failed attempts to develop sepsis drugs during the last 30 years, there is now a shift towards extracorporeal blood purification in order to remove sepsis-causing toxins or inflammatory mediators directly from the patient's blood. One of the target substances that needs to be removed is endotoxin, a very potent toxin that is present in the blood circulation of about 50% of septic patients. So far, removing endotoxin has been very challenging due to physical limitations of classical blood purification filters.

hemotune is developing a radically new approach for therapeutic blood purification that allows to remove endotoxins in a way that is much more efficient and biocompatible compared to state-of-the-art methods. In contrast to using rigid blood filters, hemotune applies tiny, strongly magnetic beads that offer a much larger accessible surface area as well as superior mobility and induce no shear stress on the blood.

The whole procedure is carried out in an add-on device to dialysis machines that is connected to the patient's blood circulation. There, the nanomagnets are administered to the blood, capture the endotoxin and are finally separated from the blood by magnetic forces. Thus, only purified endotoxin-free blood without nanomagnets will flow back to the patient.

After successful pre-clinical proof of principle and safety studies in animal models, the team now focusses on the development of a medical device for human application and prepares a first-in-man clinical trial.