

英文要旨
(300 Words)

T I T L E	Research on blood coagulation prediction maintenance system in extracorporeal circulation circuit using LED-based photoacoustic imaging
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<p style="text-align: center;">A B S T R A C T</p> <p>In blood purification therapy, blood causes a foreign body reaction and coagulates in the extracorporeal circulation circuit. Currently, pressure sensors are used to detect solidification, but since an alarm is issued after the pressure in the circuit rises, the response is delayed and various problems occur. Therefore, there is a need for a method for observing changes in the state of blood coagulation, which is more sensitive than conventional measurement methods, and a system that can predict coagulation in advance. The purpose photoacoustic of this study is to develop a measuring device and system for predictive maintenance against changes in blood coagulation over time. In order to measure the state of blood coagulation in the extracorporeal circulation circuit over time, we are studying the application of LED-based photoacoustic imaging.</p> <p>Chapter 1 showed the problems of blood coagulation in the extracorporeal circulation circuit and the necessity of predictive maintenance system and described the purpose and composition of this study.</p> <p>In Chapter 2, in order to reproduce the process of blood coagulation in the extracorporeal circulation circuit, the time until blood coagulation occurred was measured and described the identification of the timing to be measured.</p> <p>In Chapter 3, the LED-based photoacoustic imaging device was able to image the temporal phenomenon of mouse blood encapsulated in microtubes and observed the progress of blood coagulation. In addition, the possibility of reducing the amount of data handled during analysis was also shown by selecting the brightness range and site to be measured.</p> <p>In Chapter 4, the results of an experiment using an extracorporeal circulatory system were obtained. It was shown that it is possible to study the systematization of predictive maintenance.</p> <p>In Chapter 5, as a conclusion, the possibility of blood coagulation predictive maintenance by LED-based photoacoustic method was described.</p>	