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英 文 要 旨
（300 Words）

TITLE	Development of a New Antithrombogenicity Polymer AN-MPC
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ABSTRACT

Blood purification membranes, used for continuous blood purification therapy against septic shock, exhibit high adsorption of cytokines due to their negative charge. However, this high adsorption ability, often results in filter clotting, which severely restricts their use in long-term treatments. In this study, I explored the use of anti-thrombotic materials for improving blood purification membranes.

The phospholipid structure of 2-methacryloyloxyethyl phosphorylcholine (MPC) is similar to that of the vascular endothelium. It was co-polymerized with acrylonitrile (AN) to prepare an AN-MPC polymer, which was coated on a commercial poly-acrylonitrile (PAN AN69®) film. The coated PAN membrane was immersed in rabbit whole blood for 24 h and subsequently analyzed for antithrombotic activity using a scanning electron microscope. After 24 h of blood perfusion, the membrane was subjected to anti-thrombogenicity testing. The result clearly showed a high antithrombotic activity of the AN-MPC-coated PAN membrane. The structure of the thesis is as follows.

In Chapter 1, the history and development of blood purification membranes are discussed. The purpose and significance of this study are delineated.

In Chapter 2, studies using near-infrared light absorption to detect coagulation and monitor circulating blood volume are discussed.

In Chapter 3, the characteristics of blood purification membranes used in continuous blood purification therapy are described, including the clinical evaluation of currently used membranes.

In Chapter 4, the results of a study on the removal of cytokines by hemoperfusion therapy and the life expectancy associated with the therapeutic effect are presented.

In Chapter 5, the concept and design of a new antithrombogenic polymer based on the results of previous research is proposed.

In Chapters 6-9, the performance of the PAN membranes immersed in rabbit whole blood and perfused for 24 h are presented.

In Chapter 10, the findings of this study are summarized and the future prospects of antithrombogenic polymers are discussed.