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ABO-Incompatible Kidney Transplantation

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1. Introduction

ABO antigens are composed of sugar chains and exist not only on red cells but also on many other cells including endothelial cells and epithelial cells of various organs such as kidney, heart, bowel, lung, and pancreas (Marionneau et al., 2001). ABO antibodies, which have been called as isoagglutinins, are preformed antibodies directed against missing A or B antigens. The source of anti-A/B antibodies is thought to be gastrointestinal and environmental bacteria, such as the enterobacteriaceae, which possess ABO-like structures on their lipopolysaccharide coats (Yamamoto, 2004). These preformed ABO antibodies are clinically important in transfusion and organ transplantation medicine because they can cause acute hemolytic transfusion reaction in ABO-incompatible (ABO-I) blood transfusion and hyperacute rejection in ABO-I organ transplantation.

![Proposed mechanism of hyperacute rejection in ABO-incompatible organ transplantation.](image)

Hyperacute rejection is induced by the binding of anti-A/B to antigens expressed on the endothelial cells of the ABO-I graft and activation of complement system (Fig. 1). Subsequently, endothelial damage, inflammation and platelet aggregation can be provoked, leading to vascular thrombosis, occlusion of blood supply and rejection.


Ogawa, H.; Mohiuddin, M.M.; Yin, D.P.; Shen, J.; Chong, A.S. & Galili, U (2004). Mouse-heart grafts expressing an incompatible carbohydrate antigen. II. Transition from


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ABO-Incompatible Kidney Transplantation


Understanding the Complexities of Kidney Transplantation


Kidney transplantation is a complex field that incorporates several different specialties to manage the transplant patient. This book was created because of the importance of kidney transplantation. This volume focuses on the complexities of the transplant patient. In particular, there is a focus on the comorbidities and special considerations for a transplant patient and how they affect kidney transplant outcomes. Contributors to this book are from all over the world and are experts in their individual fields. They were all individually approached to add a chapter to this book and with their efforts this book was formed. Understanding the Complexities of Kidney Transplantation gives the reader an excellent foundation to build upon to truly understand kidney transplantation.

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