The Expression of α-Gal Epitope in Skin from TG Pigs for Xenotransplantation

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INTRODUCTION

- The Galα1,3Gal epitope (Galα1,3Galα1,4GlcNAc-R) is responsible for hyperacute rejection (HAR) during transgenic pig-to-non-human primate xenotransplantation. Although the generation of pigs lacking the α1,3galactosyltransferase ($GT^{-/-}$) has overcome hyperacute rejection, antibody-mediated rejection is still a problem.
- It is possible that other enzymes synthesize antigens similar to Galα1,3Gal epitopes that are recognized by xenoreactive antibodies.
- The glycosphingolipid isoglobotrihexosylceramide synthase (iGb3s) represents such a candidate expressing an alternative Galα1,3Gal epitope.

OBJECTIVE

This study was performed to investigate the expression of α-Gal epitope in the skin derived from $GT^{-/-}$, $GT^{-MCP/-MCP}$ transgenic piglets.

GENERAL INFORMATION

Our study protocol and standard operating procedures for the treatments of the pigs used were reviewed and approved by the Institutional Animal Care and Use Committee of the National Institute of Animal Science, RDA (approval number NIAS2016-199, D-grade).

MATERIALS AND METHODS

- Source animals : skins from $GT^{-/-}$; $GT^{-MCP/-MCP}$

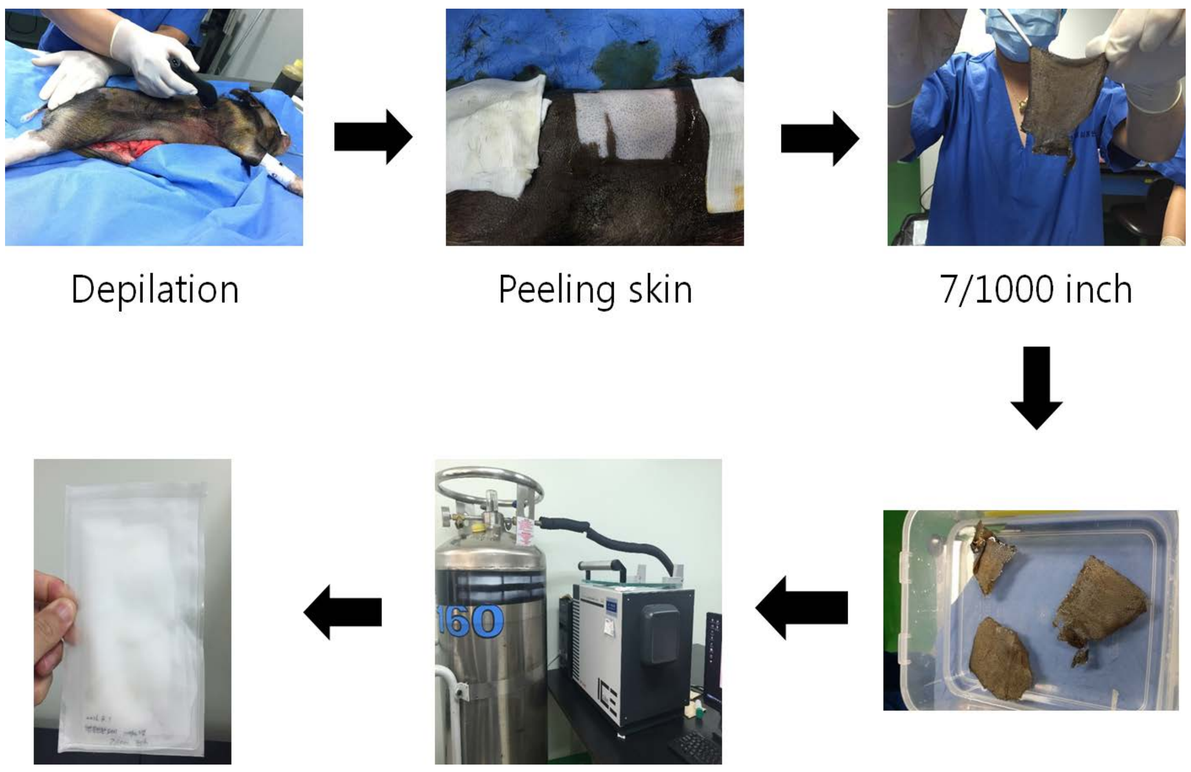

Figure 1. Preparation of decellularized skin from transgenic pigs

RESULTS

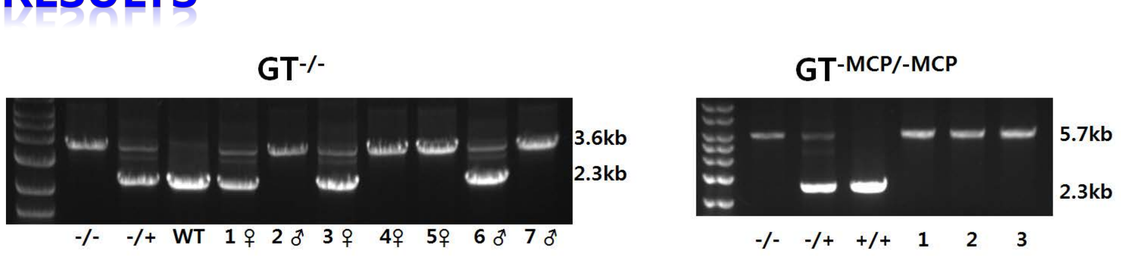

Figure 2. Confirmation of gene targeting in the TG piglets

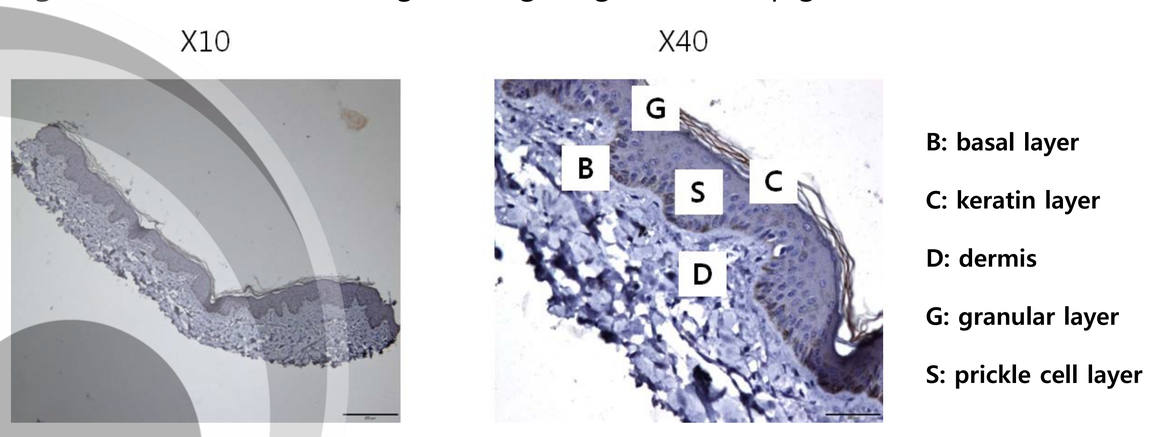

Figure 3. Histological analysis of epidermal skin from $GT^{-/-}$ piglet

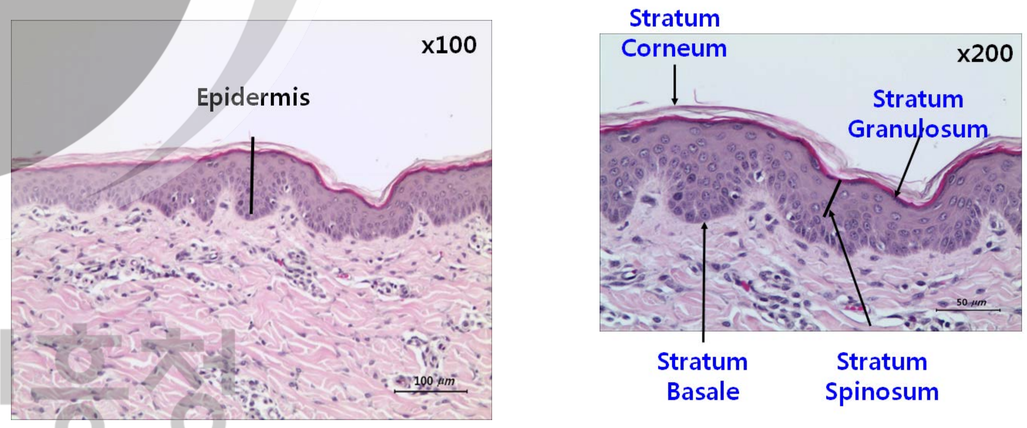

Figure 4. Histological analysis of epidermal skin from $GT^{-MCP/-MCP}$ piglet

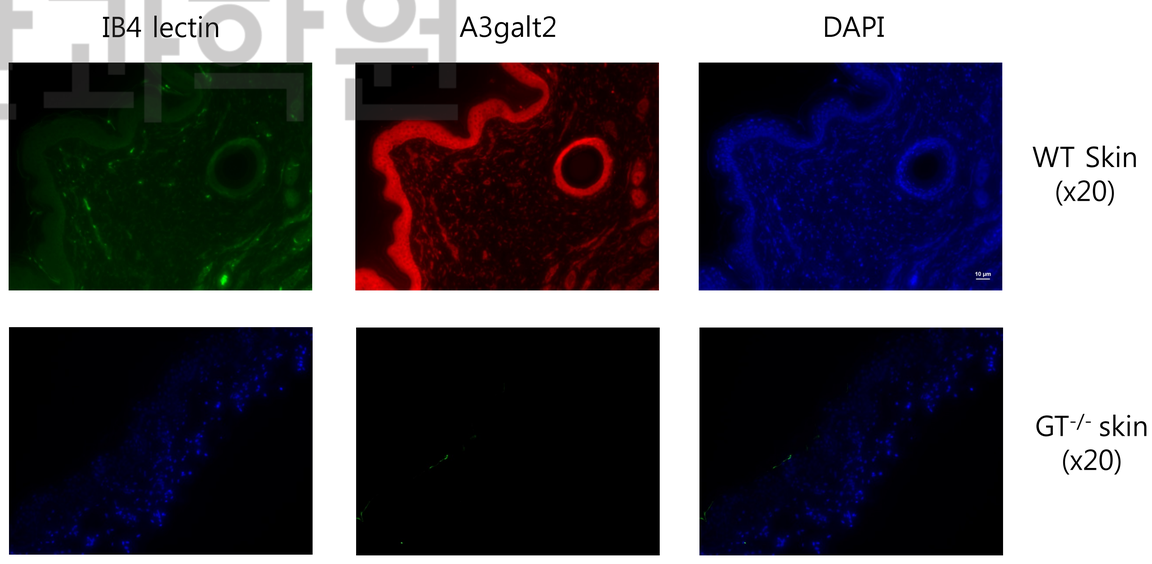

Figure 5. Immunofluorescence of α-Gal epitope expression in the skin from $GT^{-/-}$ piglet

CONCLUSION

- Taken together, it can be postulated that the knocked out of GT gene may not be enough to inhibit the expression of α-Gal epitope.
- Further studies are needed to evaluate the functions of the double knock out of GT and iGb3s on the expression of α-Gal epitope.

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