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## Decellularization of xenogeneic artery for small-diameter vascular graft: Mild alkaline treatment removes galactose-alpha-1,3-galactose and retains vascular extracellular matrix

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Decellularization of porcine blood vessels provides an alternative approach to produce small diameter vascular graft (SDVG) of diameter < 4mm required in plastic reconstruction, coronary bypass and peripheral vascular disease. Galactose-alpha-1,3-galactose ( $\alpha$ -gal) is believed to account for hyperacute rejection in pig-to-human transplantation. In proteomics, alkaline treatment serves as one of the non-enzymatic methods in deglycosylation but has not been explored in the area of  $\alpha$ -gal removal in decellularization as pH is usually considered to be damaging to the native extracellular matrix (ECM). This work investigated alkali concentration on removal of  $\alpha$ -gal from porcine carotid artery (PCA), together with its effect on removal of cellular protein and retention of main vascular ECM proteins. PCAs (diameter = 1.5-2mm) were treated with 0, 0.01 and 0.1M alkali at 37°C overnight.  $\alpha$ -gal (Isolectin B4),  $\alpha$ -actin (western), collagen (Direct Red and Sircol® assay) and elastin (Orcein and Fastin® assay) were studied in treated arteries to evaluate xenoantigen removal and ECM retention.  $\alpha$ -gal level was reduced with NaOH concentration by about 70±10% (0.01M) and 80±5% (0.1M). No  $\alpha$ -actin was detected in 1mg of tissue treated with NaOH. Above 90.0±2.5% of collagen was retained in PCA treated with 0.01M NaOH but only about 60.0±7.5% collagen was left at 0.1M NaOH. Furthermore, no elastin loss was observed in all treatments. In conclusion, this study suggests mild alkaline treatment provides a simple and promising treatment to produce SDVG from xenogeneic artery by high degree of  $\alpha$ -gal removal, total removal of  $\alpha$ -actin and high retention of important vascular ECM. (250 words)

### Biography

Chan Wing Yue has completed his PhD in 2010 from Nanyang Technological University, Singapore. He is currently working as scientific officer in Department of Plastic, Reconstructive & Aesthetic Surgery, Singapore General Hospital, responsible for cultured epithelial autograft and skin allograft processing for burn patients.

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