Transdifferentiation of human dermal fibroblasts to smooth muscle like cells: a novel method to study the effect of MYH11 and ACTA2 variants in the aortic aneurysm wall

Disclosure of Interest

Speaker name: Natalija Bogunovic

I do not have any potential conflict of interest.
How can we study the effect of mutations in SMC genes causing aortic aneurysms?

Aortic biopsies

- SMC

Skin biopsies

- Fibroblasts
- +5 ng/ml TGFβ1
- matriderm

Transdifferentiation:
- 14 days

SMC-like cells

Contractile proteins
Characterization of SMC-like cells

Alpha smooth muscle actin (n=7)
early marker

Calponin
late marker

Transdifferentiated

DAPI aSMA

Transdifferentiated

DAPI Calponin
Patients with MYH11 and ACTA2 variants

Alpha smooth muscle actin early marker

Calponin late marker
• Direct differentiation of fibroblasts into SMC in 14 days
• Cells express early and late SMC markers
• Efficient method to study effects of unclassified variants in SMC genes on mRNA level
Future plans
Acknowledgements

Department of Vascular surgery
• Kak K. Yeung
• Willem Wisselink
• Jan D. Blankensteijn
• Jorn P. Meekel

Department of Clinical Genetics
• Dimitra Micha
• Gerard Pals

Department of Physiology
• Peter L. Hordijk
• Igor Kovacevic
• Joanna Azevedo
• Mark Villa
• Manon Pronk
• Jan van Bezu
• Erik Valent
• Rene Musters
• Jeroen Kole

ACTA
• Behrouz Zandieh-Doulabi