

Interplay between inflammation and calcification in cardiovascular diseases

Citation for published version (APA):

Skenteris, N. T. (2022). *Interplay between inflammation and calcification in cardiovascular diseases*. [Doctoral Thesis, Maastricht University, Karolinksa Institutet]. Maastricht University. <https://doi.org/10.26481/dis.20220531ns>

Document status and date:

Published: 01/01/2022

DOI:

[10.26481/dis.20220531ns](https://doi.org/10.26481/dis.20220531ns)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

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Propositions belonging to the thesis entitled

Interplay between inflammation and calcification in cardiovascular diseases

By Nikolaos-Taxiarchis Skenteris

1. Reanalysis of publicly available single-omics data reveals an undescribed network in calcific aortic valve disease closely related to mechanisms in Alzheimer's disease. Interrelated pathways such as coagulation and complement and platelet activation participate in the pathophysiology of valvular calcification. (this thesis)
2. Osteomodulin is a novel plasma and tissue marker of osteogenic vascular remodeling and extracellular matrix calcification. (this thesis)
3. Elevated osteomodulin gene expression in atherosclerotic plaques indicates a decreased risk of future cardiovascular events and death. (this thesis)
4. The activation state of vascular mast cells reflects the calcification degree of an atherosclerotic plaque. (this thesis)
5. Cardiovascular calcification lies on the crossroad between arterial inflammation and bone ossification (Terence M. Doherty TM., et al. Proc Natl Acad Sci U S A. 2003)
6. Advances in molecular imaging and big data technology, including multi-omics and network medicine not only provide the opportunity to portray the cellular and matrix composition of the atherosclerotic plaque but also will furnish new biomarkers for cardiovascular risk prediction. (summarised by Slenders, L., et al. Front Cardiovasc Med. 2022; Holm Nielsen S., et al. J. Intern. Med. 2020; Lubrano V and Balzan S. Clin Sci. 2021; Rogers MA and Aikawa E. Nat Rev Cardiol. 2019)
7. The classical conception of the vulnerable plaque is on the wane and demands re-consideration that reckons the wide diversity of morphological phenotypic presentations. (summarised by Libby, P. Nature 2021; Pasterkamp, G., et al. Arterioscler Thromb Vasc Biol. 2022)
8. Science should generate in a systematic way reliable knowledge from a vast ocean of variables.
9. Society uses science as a tool to understand nature. The consistent addition of new knowledge should be conveyed back to society as wisdom for potential change and improvement in the quality of people's life, which is usually neglected. For this reason, the channel between science and society must always be open, so that the global challenges of the latter can be supported by the first.