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# Atherosclerotic Plaque Rupture Prediction: Imaging-Based Computational Simulation and Multiphysical Modelling

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**Abstract:** In this article, we summarize our previous work in imaging-based computational modelling and simulation of the interaction between blood flow and atherosclerotic plaque. We also discussed our recent developments in multiphysical modelling of plaque progression and destabilization. Significance and translation of the modelling study to clinical practice are discussed in order to better assess plaque vulnerability and accurately predict a possible rupture.

**Keywords:** Atherosclerosis, vulnerable plaque, medical imaging, computational modelling and simulation, mathematical model, plaque progression.

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Professor Zhi-Yong Li is Professor of Biomedical Engineering. He has made significant contributions to understanding the biomechanics of plaque rupture. The main focus of his work has been the development of a better risk stratification for stroke and myocardial infarction in order to improve current clinical practice in the management of patients with vulnerable plaques. The work involves MRI/IVUS/OCT, stress analysis, material testing and mechanical modelling. He was awarded a JRF of Wolfson College at University of Cambridge and then elected as a Fellow of the College. He has maintained an excellent publication track record, including over 100 peer-reviewed SCI-indexed journal papers. Most papers are published in high-quality journals including Nature Review Cardiology, Circulation, New England Journal of Medicine, JACC, Stroke and Journal of Biomechanics etc.