

## **Cytokines and their signalling pathways as therapeutic targets in atherosclerosis**

**Dipak P Ramji**

Cardiff University, United Kingdom

Cytokines play crucial roles in the control of immune and inflammatory responses. Abnormalities in cytokines, their receptors or the downstream signalling they initiate are associated with a number of inflammatory disorders, including atherosclerosis. Approaches to limit the actions of pro-inflammatory cytokines include neutralization (blocking antibodies or decoy receptors), receptor antagonists and small molecule inhibitors of intracellular signal transduction pathways. Other avenues include use of anti-inflammatory cytokines or agents that augment their expression/actions. A more thorough understanding of cytokine actions in disease, particularly signalling pathways, is essential for the identification of new therapeutic targets/approaches. A key area of research focus in my laboratory has been on cytokine actions and signalling in atherosclerosis. Atherosclerosis, the underlying cause of myocardial infarction and cerebrovascular accidents, is an inflammatory disorder of medium and large arteries and is responsible for most deaths worldwide. Cytokines such as interferon- $\gamma$  and interleukin (IL)- $1\beta$  promote atherosclerosis whereas others, particularly IL-10, IL-33 and transforming growth factor- $\beta$ , attenuate the disease. Our research has provided novel insights into intracellular signalling pathways and molecular mechanisms underlying the actions of such cytokines, particularly in macrophages in atherosclerosis. These will be presented in the context of current therapies and future drug discovery and development. Interesting, many conventional therapies, such as statins and nutraceuticals, also modulate cytokine signalling and these will be also discussed. Finally, the limitation of cytokine therapeutics and the possibility of approaches involving modulation of cells that produce anti-atherogenic cytokines will be presented.

### **Biography**

Dipak P Ramji is professor of cardiovascular science at the school of biosciences in Cardiff University. He received his BSc (Hons) degree (Biochemistry) and his PhD (Molecular Biology) from the University of Leeds. This was followed by post-doctoral research at the European Molecular Biology Laboratory (Heidelberg) and the Istituto di Ricerche di Biologia Molecolare P. Angeletti (Rome) with fellowships from the Royal Society and the EU. He joined Cardiff University in 1992 and completed 25 years of service in August 2017. His research is focused on understanding how the immune and inflammatory responses regulate cellular processes in heart disease with the goal of attaining deeper mechanistic insight and identifying preventative/therapeutic agents. His research has been funded by several organisations and received continuous funding from the British Heart Foundation since 1997. He has published over 150 research articles (h index 34 and i10 index 68 with over 5700 citations). He is an editorial board member of 16 international journals; regular organising committee member, speaker and track/session chair at international conferences on heart disease; involved in grant evaluation for over 20 organisations; and supervised over 25 PhD students; involved in teaching and administration, including postgraduate tutor for the biomedicine division at the School of Biosciences and external examiner for Biochemistry and Biomedical Sciences at the University of Reading and King's College London.

Ramji@Cardiff.ac.uk