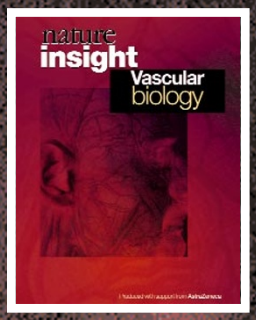
nature insight

Vascular biology



Research in vascular biology has boomed in recent years. The advances made have led to significant insights into the treatment not only of pulmonary vascular diseases such as atherosclerosis, ischaemic and congenital heart disorders, stroke, thrombosis and hypertension, but also diabetes and tumour development. But cardiovascular diseases remain a major cause of mortality worldwide, regardless of the recent advances in medical and surgical treatment. Indeed, as life expectancy in the developed world increases, cardiovascular conditions affecting the elderly are also likely to rise. And this escalation in cardiovascular disorders may not be confined to the developed world as recent data suggest that heart disease is also increasing among Asians and Chinese. As we are catapulted into the genomics era, exciting new therapeutic avenues are uncovered which may eventually lead to the tailoring of therapies to a patient's specific metabolic and genetic profile. To accelerate progress into the medical treatment of these disorders we must start by expanding our knowledge in the basic regulatory mechanisms underlying vascular biology. With this view in mind, this month's *Nature* Insight reveals the current research developments that are relevant to the understanding of the complex nature of vascular biology.

On page 221 Deepak Srivastava and Eric Olson provide an overview into the underlying genetics controlling cardiac development. The study of complex heart diseases has always been a difficult task, and in his review on page 227 Kenneth Chien discusses how the availability of genomic databases has empowered our understanding of these complex disorders. The atherosclerotic lesion has been recognized for many centuries and is the leading cause of death in the western world, often acting as the underlying trigger of heart attacks. On page 233 Aldons Jake Lusis provides insights into its complex aetiology and how therapeutic development may be achieved through genetic dissection of this progressive condition. Blood vessels have a more complex role in body homeostasis than merely acting as a simple conduit for the distribution of oxygen and nutrients. A background into the developmental process of angiogenesis is revealed by George Yancopoulos and colleagues on page 242, while on page 249 Peter Carmeliet and Rakesh Jain examine how this process is derailed in disease, in particular in tumorigenesis. Thrombin and platelets are important in myocardial infarction and other disorders. On page 258 Shaun Coughlin explains how our understanding of thrombin signalling may lead to new therapies. Finally, on page 265 Edward Rubin and Alan Tall highlight the promises of genomic technology in vascular biology.

We are pleased to acknowledge the financial support of AstraZeneca in producing this Insight. Of course, *Nature* carries the sole responsibility for all editorial content and peer-review. *Nature* has been revered in publishing many key studies in the field of vascular biology, we hope that you will find this collection of reviews enlightening and inspiring.

Andrea Kauffmann-Zeh Senior Editor

Ritu Dhand Insight Programme Editor

Publisher and liaison for corporate support **Liz Allen (e.allen@nature.com)**