

**Cover illustration**

The human heart, based on a drawing by Paolo Mascagni (1755–1815). (Courtesy of M. Kulyk/SPL)

**Editor, Nature**

Philip Campbell

**Insights Publisher**

Sarah Greaves

**Publishing Assistant**

Claudia Banks

**Insights Editor**

Ritu Dhand

**Production Editor**

Davina Dudley-Moore

**Senior Art Editor**

Martin Harrison

**Art Editor**

Nik Spencer

**Sponsorship**

Emma Green

**Production**

Jocelyn Hilton

**Marketing**

Katy Dunningham

Elena Woodstock

**Editorial Assistant**

Alison McGill

# CARDIOVASCULAR DISEASE

**C**ardiovascular disease is the leading cause of death globally. According to the World Health Organization, it was responsible for 30% of all deaths in 2005. Although typically considered a disease of developed countries, its incidence is increasing in the developing world.

Cardiovascular disease usually stems from vascular dysfunction — for example, as a result of atherosclerosis, thrombosis or high blood pressure — which then compromises organ function. Most notably, the heart and brain can be affected, as occurs in myocardial infarction and stroke, respectively. For heart disease in particular, a wide range of underlying pathologies can lead to defective functioning of the heart muscle.

In the past few decades, major improvements have been made in treating some types of cardiovascular disease. In the case of coronary heart disease, for example, therapies such as the administration of statins and the insertion of stents have reduced death rates. However, new treatment options are urgently needed for all types of cardiovascular disease. Moreover, improving diagnosis is crucial, because by detecting the early stages of disease, the focus of therapy could be shifted from treatment to prevention.

This Insight brings together review articles about atherosclerosis, thrombosis, heart failure, cardiac arrhythmia and congenital heart disease. These articles explore recent progress in understanding the mechanisms that lead to disease and discuss the implications of these advances for identifying new therapeutic targets and developing new therapeutic strategies, including the potential use of stem cells for treating heart disease. Two progress articles also provide an update on how new technologies for identifying disease biomarkers and for imaging might enable disease to be detected at early stages.

We are pleased to acknowledge the financial support of Schering-Plough in producing this Insight. As always, *Nature* carries sole responsibility for all editorial content and peer review.

**Michael Basson, Senior Editor, *Nature Medicine***

## REVIEWS

- 904 Translating molecular discoveries into new therapies for atherosclerosis**  
D. J. Rader & A. Daugherty
- 914 Triggers, targets and treatments for thrombosis**  
N. Mackman
- 919 Tackling heart failure in the twenty-first century**  
J. O. Mudd & D. A. Kass
- 929 A genetic framework for improving arrhythmia therapy**  
B. C. Knollmann & D. M. Roden
- 937 Stem-cell therapy for cardiac disease**  
V. F. M. Segers & R. T. Lee
- 943 The developmental genetics of congenital heart disease**  
B. G. Bruneau

## PROGRESS

- 949 The search for new cardiovascular biomarkers**  
R. E. Gerszten & T. J. Wang
- 953 Imaging of atherosclerotic cardiovascular disease**  
J. Sanz & Z. A. Fayad

nature  
insight