

Chemistry for Tomorrow's World

Drugs and therapies



There is a huge, unmet need for treatments for chronic diseases, such as heart disease, cancer and diabetes, which cause millions of deaths globally every year. Chronic diseases cause more than twice the number of deaths per year than the combined total from infectious diseases, nutritional deficiencies and conditions related to pregnancy and birth.¹

Drugs and therapies have seen significant improvements in the last 30 years but further progress must be made in order to optimise delivery and improve global availability. The chemical sciences play a central role in the entire drug discovery, development and healthcare process.

How can the chemical sciences help?

- Scientists in the biological and chemical sciences need to collaborate so that they can fully understand the process of disease progression. Identification of key turning points in disease progression and a greater understanding of the underlying pathology would enable the better design of treatments.
- By improving knowledge of the chemistry of living systems, such as how cells interact within the body and how drugs are absorbed at a cellular level, directed treatments can be designed. This would maximise the efficiency of any treatment while hopefully minimising any side effects.
- Analytical chemistry offers tools for measuring and understanding genes, proteins and other biochemicals; such measurements will underpin the potential for delivering individually tailored therapies.
- Through increased understanding of the chemical basis of toxicology, scientists can improve their predictions of potentially harmful effects of new drugs and therapies. This will in turn reduce the risk associated with trialling and releasing new treatments.
- Chemical scientists can develop sensitive tools for effective and non-invasive monitoring of the effects of therapies, which will result in the development of improved treatments.

About the RSC & Chemistry for Tomorrow's World

The Royal Society of Chemistry (RSC) is the leading society and professional body for chemical scientists. Over 2008 and 2009, it gathered expert views to identify priority areas where the chemical sciences can play an important role in the development of society.

For more on this initiative please visit our website: www.rsc.org/roadmap, contact us at roadmap@rsc.org or call the RSC science team on +44 (0)1223 432424.

¹ Preventing chronic diseases: A Vital investment, World Health Organisation, 2005