

Molecular BioSystems

www.molecularbiosystems.org

RSC Publishing is a not-for-profit publisher and a division of the Royal Society of Chemistry. Any surplus made is used to support charitable activities aimed at advancing the chemical sciences. Full details are available from www.rsc.org

IN THIS ISSUE

ISSN 1742-206X CODEN MBOIBW 2(6/7) 273–336 (2006)



Cover

See Jamie Carroll, Madushi Raththagala, Wasanthi Subasinghe, Stacy Baguzis, Theresa D'amico Oblak, Paul Root, and Dana Spence, page 305. The release of ATP from diabetic erythrocytes in resistance vessels: a recognized nitric oxide stimulus affected by oxidative stress. Image reproduced with permission of Dana Spence *et al.*, from *Mol. BioSyst.*, 2006, 2, 305.

CHEMICAL BIOLOGY

B21

Chemical Biology

June 2006/Volume 1/Issue 6

www.rsc.org/chemicalbiology

Drawing together research highlights and news from all RSC publications, *Chemical Biology* provides a 'snapshot' of the latest developments in chemical biology, showcasing newsworthy articles and significant scientific advances.

HOT OFF THE PRESS

283



Hot off the Press

Topics highlighted in this month's *Hot off the Press* include steps towards personalized medicine, viral encapsulation of gold nanoparticles, regulation of heat shock protein 70, new insights into the molecular pathogenesis of Alzheimer's disease, inhibition of Bcr-abl kinase in chronic myelogenous leukemia, detection of DNA using a self-fuelled DNA machine and a traditional solution to a new problem.

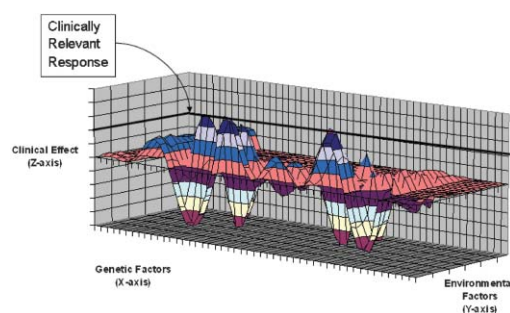
OPINION

288

The impact of systems biology and biosimulation on drug discovery and development

Seth Michelson

Drug discovery and development involves a series of data-gathering steps to elucidate the underlying pathophysiology of a disease. However, data by itself is not enough; one must interpret them in the context of the physiology in order to understand their meaning. Computer-aided simulation of biological systems is now improving the drug development process by providing a means to integrate and interpret large-scale data sets in a physiologically relevant context.



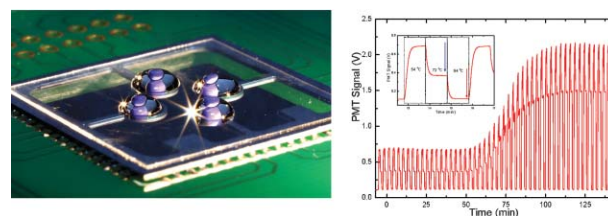
METHODS

292

Disposable real-time microPCR device: lab-on-a-chip at a low cost

Pavel Neuzil,* Juergen Pippner and Tseng Ming Hsieh

Real-time microPCRs were conducted on a disposable piece of glass placed on top of a micromachined silicon chip. A DNA sample was encapsulated in mineral oil to prevent the evaporation of water. It is a basic unit of a new generation of lab-on-a-chip systems.

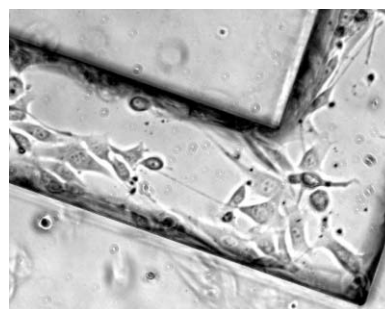


299

Micropatterning polyvinyl alcohol as a biomimetic material through soft lithography with cell culture

Chao-Min Cheng and Philip R. LeDuc*

The use of polyvinyl alcohol (PVA) for use in production of highly robust and functional microchips is demonstrated. The utility of PVA for cellular patterning using soft lithography is shown and should have applications in areas including tissue engineering, biomimetics and cellular micropatterning.



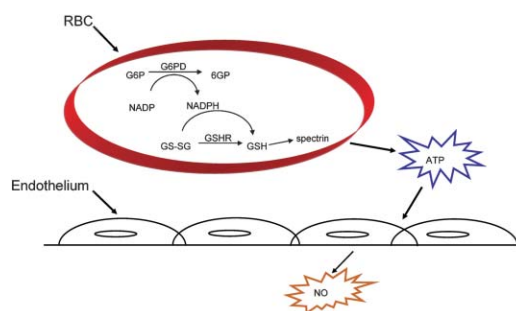
PAPERS

305

An altered oxidant defense system in red blood cells affects their ability to release nitric oxide-stimulating ATP

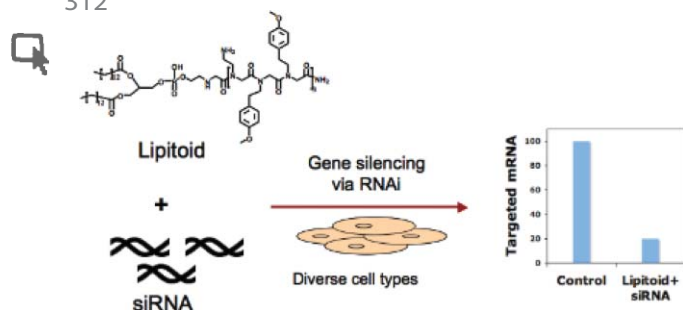
Jamie Carroll, Madushi Raththagala, Wasanthi Subasinghe, Stacy Baguzis, Teresa D'amico Oblak, Paul Root and Dana Spence*

The ATP released from the erythrocytes of diabetic patients is only half of that of non-diabetic controls. Experiments that employ the red blood cells from rabbits suggest that the decreased ATP release may be due to oxidant stress within the cells.



PAPERS

312

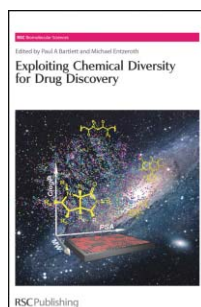
**A peptidomimetic siRNA transfection reagent for highly effective gene silencing**

Yeliz Utku, Elinor Dehan, Ouathék Ouerfelli, Fabio Piano, Ronald N. Zuckermann,* Michele Pagano and Kent Kirshenbaum*

We describe the use of a lipitoid, a cationic oligopeptoid-phospholipid conjugate, for non-viral transfection of siRNA. The lipitoid promotes extensive gene downregulation even in primary IMR-90 cells in which other commercial reagents are typically ineffective.

BOOK CHAPTER

318

**NMR-based screening: a powerful tool in fragment-based drug discovery**

Jochen Klages, Murray Coles and Horst Kessler

This is Chapter 12 of the book *Exploiting Chemical Diversity for Drug Discovery* which forms part of the RSC Biomolecular Sciences series. More information about this book and the whole series is available from www.rsc.org/biomolecularsciences or the RSC Sales team, email: sales@rsc.org.