

Molecular BioSystems

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IN THIS ISSUE

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Cover

See Mark R. Wilson, Justin J. Yerbury and Stephen Poon, pp. 42–52. Potential roles of abundant extracellular chaperones in the control of amyloid formation and toxicity. Image reproduced by permission of Mark R. Wilson, Justin J. Yerbury and Stephen Poon from *Mol. BioSyst.*, 2008, 4, 42.



Inside cover

See Najl V. Valeyev *et al.*, pp. 66–73. Ribbon structures of the protein calmodulin with and without four bound calcium ions (red dots). The underlying image shows pollen tubes delivering the male gametes to the egg apparatus in a cereal. Calcium–calmodulin interactions are important in polarized growth and guidance of pollen tubes over many millimetres, involving many candidate targets for regulation by calmodulin. Image reproduced by permission of N. V. Valeyev, P. Heslop-Harrison, I. Postlethwaite, N. V. Kotov and D. G. Bates from *Mol. BioSyst.*, 2008, 4, 66.

CHEMICAL BIOLOGY

B1

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.

Chemical Biology

January 2008/Volume 3/Issue 1

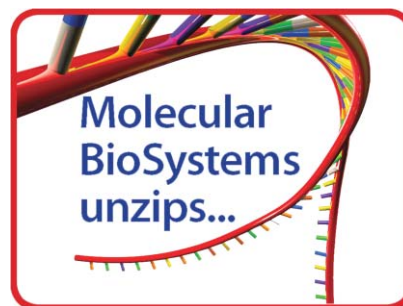
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EDITORIAL

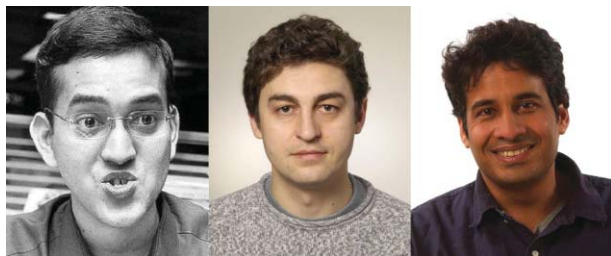
10

Molecular BioSystems spins out into 2008

After a very successful 2007 and with its first impact factor *Molecular BioSystems* separates from its host journal, *Chemical Communications*, as a fully fledged solo publication. We reflect on the last year and look forward to an even better year in 2008.



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Meet the new members of the Editorial Board

The Editorial Board of *Molecular BioSystems* is made up of an international team of enthusiastic scientists whose expertise covers a broad subject range. Here we profile M. Madan Babu, Blagoy Blagoev and Sachdev Sidhu who have joined the Board this year.

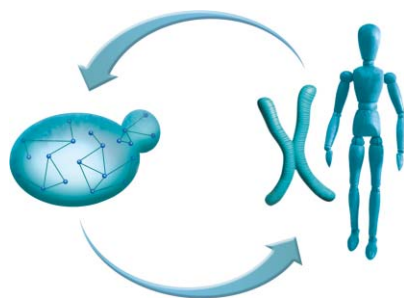
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Hot off the press

Hot off the Press highlights recently published work for the benefit of our readers. Our contributors this month have focused on protein–protein interaction networks, the development of specific kinase inhibitors and the identification of biomarkers for the diagnosis of Alzheimer's disease. New contributors are always welcome. If you are interested please contact molbiosyst@rsc.org for more information, we'd like to hear from you.

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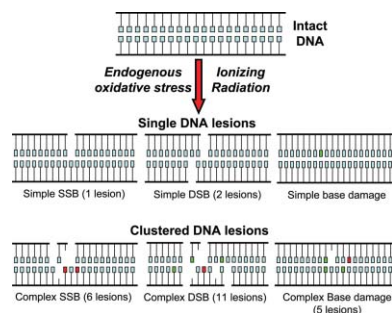


Systematic screens for human disease genes, from yeast to human and back

Fabiana Perocchi, Eugenio Mancera and Lars M. Steinmetz*

We review how integration of genomic data in yeast and human helps to elucidate the genetic basis of mitochondrial diseases.

30



Processing of DNA damage clusters in human cells: current status of knowledge

Alexandros G. Georgakilas

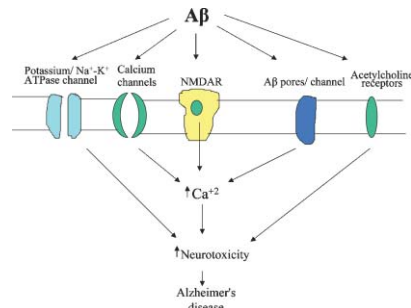
Clustered DNA lesions are the hallmark of ionizing radiation. In this review we present the current knowledge in the processing of oxidatively-induced clustered DNA lesions in human cells and tissues, focusing primarily on the possible pathophysiological implications of endogenous clustered DNA damage.

36

Alterations of some membrane transport proteins in Alzheimer's disease: role of amyloid β -peptide

Rukhsana Sultana and D. Allan Butterfield*

This paper presents the current understanding of amyloid β -peptide, a main component of senile plaques in Alzheimer's disease (AD), on the oxidative dysfunction of some membrane proteins, including ion-motive ATPases, channels, and neurotransmitter receptors with implications for AD pathology.



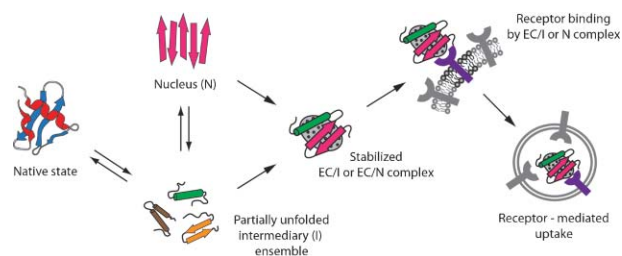
REVIEW

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Potential roles of abundant extracellular chaperones in the control of amyloid formation and toxicity

Mark R. Wilson,* Justin J. Yerbury and Stephen Poon

Newly identified abundant extracellular chaperones (ECs) may protect the body against dangerously hydrophobic proteins/peptides. This review proposes that ECs stabilize extracellular misfolded proteins by binding to them, and then guide them to specific receptors for uptake and subsequent degradation.



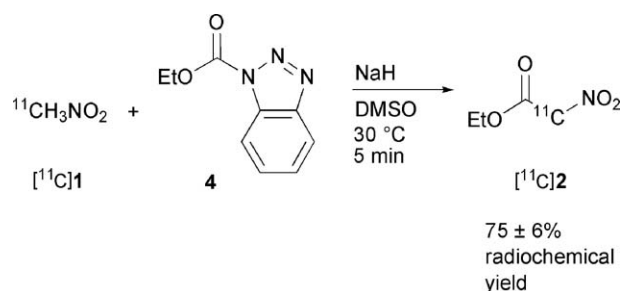
COMMUNICATIONS

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Rapid C-carboxylation of nitro[^{11}C]methane for the synthesis of ethyl nitro[2- ^{11}C]acetate

Koichi Kato,* Ming-Rong Zhang and Kazutoshi Suzuki

Ethyl nitro[2- ^{11}C]acetate was synthesised by rapid C-carboxylation of nitro[^{11}C]methane in $75 \pm 6\%$ radiochemical yield.

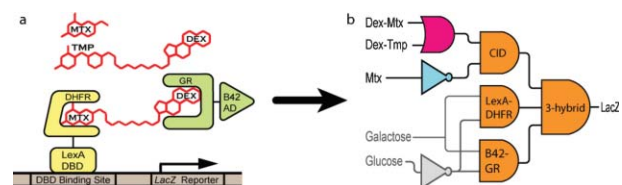


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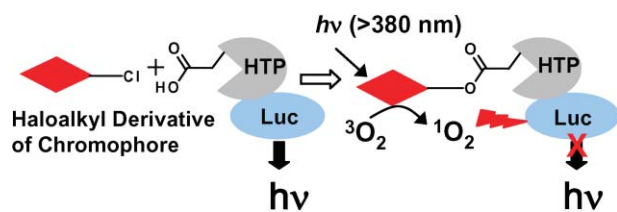
Transcription factor logic using chemical complementation

Jonathan E. Bronson, William W. Mazur and Virginia W. Cornish*

Chemical complementation was used to make a transcription factor circuit capable of performing complex Boolean logic.



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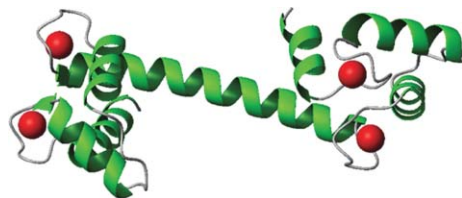


A general system for evaluating the efficiency of chromophore-assisted light inactivation (CALI) of proteins reveals Ru(II) tris-bipyridyl as an unusually efficient “warhead”

Jiyong Lee, Peng Yu, Xiangshu Xiao and Thomas Kodadek*

A general and convenient system for the comparison of different chromophores for *in vitro* and *in vivo* CALI efficiency is reported. This technique has been used to identify Ru(bpy)₃²⁺ as an unusually efficient “warhead” for this purpose.

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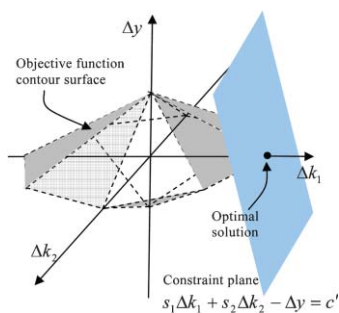


Multiple calcium binding sites make calmodulin multifunctional

Najl V. Valeyev,* Pat Heslop-Harrison, Ian Postlethwaite, Nicolai V. Kotov and Declan G. Bates

The model for Ca²⁺ binding to CaM and Ca²⁺-CaM-dependent target regulation proposes an explanation for the selectivity of multisite CaM-dependent regulation by a variety of target proteins.

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Proximate parameter tuning for biochemical networks with uncertain kinetic parameters

Stephen J. Wilkinson, Neil Benson and Douglas B. Kell*

Parameter estimation is a hard, important and usually underdetermined problem. We introduce the constraint that the estimated parameters should be as close as possible to stated values in a way that is both deterministic and very effective.

ADDITION AND CORRECTION

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Tyson E. Graber and Martin Holcik

Cap-independent regulation of gene expression in apoptosis