

ChemComm

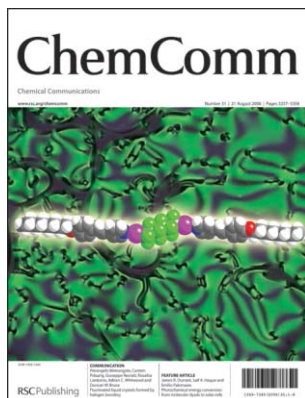
Chemical Communications

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IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (31) 3257-3356 (2006)



Cover

See Pierangelo Metrangolo, Carsten Präsang, Giuseppe Resnati, Rosalba Liantonio, Adrian C. Whitwood and Duncan W. Bruce, page 3290. Fluorinated mesogens can be prepared through a supramolecular approach based on halogen bonding. Surprisingly, the microphase separation associated with perfluoroalkyl chains is absent in the mesophase. Image reproduced by permission of Duncan W. Bruce *et al.* from *Chem. Commun.*, 2006, 3290.



Inside cover

See Thomas Brasey, Rosario Scopelliti and Kay Severin, page 3308. The addition of K^+ ions promotes the rearrangement of a hexanuclear [(cymene)Ru(pyridine-3,5-dicarboxylate)]₆ complex into a dodecanuclear coordination cage with an icosahedral geometry. Image reproduced by permission of Kay Severin *et al.* from *Chem. Commun.*, 2006, 3308.

CHEMICAL SCIENCE

C57

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

August 2006/Volume 3/Issue 8

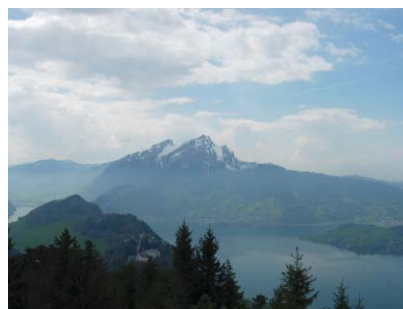
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CONFERENCE REPORT

3269

Highlights from the 41st EUCHEM Conference on Stereochemistry, Bürgenstock, Switzerland, April 2006

Richard S. Grainger and Andrew J. Wilson



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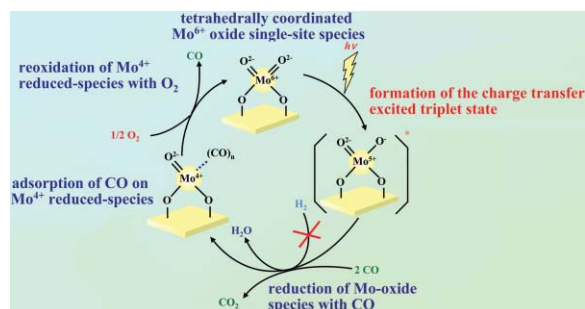
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Single-site photocatalytic solids for the decomposition of undesirable molecules

Masakazu Anpo and John Meurig Thomas

Photocatalytic solids are useful catalysts for effecting reactions that are of importance in both remedial and preparative contexts and are readily probed during the actual processes of catalytic turnover, unlike most conventional solid catalysts. They are amenable to investigation by (*in situ*) X-ray absorption (XAFS), FT-IR, UV-Vis, and EPR spectroscopic studies as well as to photoluminescence measurement. This affords greater insight into the mechanisms of the photocatalytic reactions.



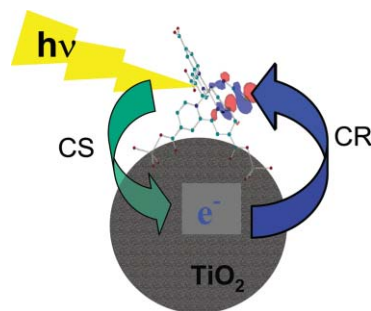
FEATURE ARTICLE

3279

Photochemical energy conversion: from molecular dyads to solar cells

James R. Durrant,* Saif A. Haque and Emilio Palomares

We review our recent studies of photochemical solar energy conversion, focusing upon the electron-transfer dynamics of dye-sensitised, nanocrystalline TiO₂ films and their application to molecular-based solar cells.



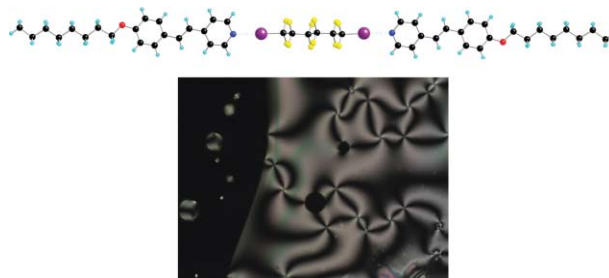
COMMUNICATIONS

3290

Fluorinated liquid crystals formed by halogen bonding

Pierangelo Metrangolo,* Carsten Präsang, Giuseppe Resnati,* Rosalba Liantonio, Adrian C. Whitwood and Duncan W. Bruce*

New supramolecular fluorinated liquid crystals have been obtained by an approach based on the halogen bonding driven self-assembly of non-mesomorphic alkoxystilbazoles with α,ω -diiodoperfluoroalkanes.

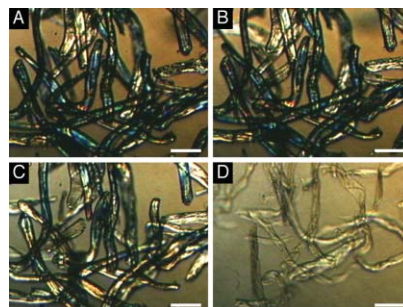


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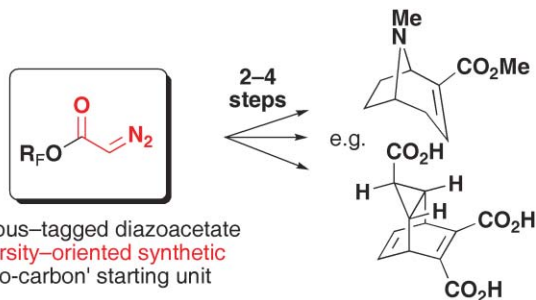
Cooking cellulose in hot and compressed water

Shigeru Deguchi,* Kaoru Tsujii and Koki Horikoshi

Crystalline cellulose is found to be cooked in water at 320 °C and 25 MPa.



3296

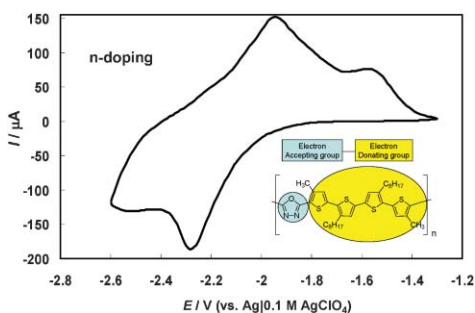


Skeletal diversity construction *via* a branching synthetic strategy

Emma E. Wyatt, Suzanne Fergus,
Warren R. J. D. Galloway, Andreas Bender, David J. Fox,
Alleyn T. Plowright, Alan S. Jessiman, Martin Welch and
David R. Spring*

A branching synthetic strategy was used to efficiently generate structurally diverse scaffolds, which span a broad area of chemical descriptor space, and their biological activity against MRSA was demonstrated.

3299

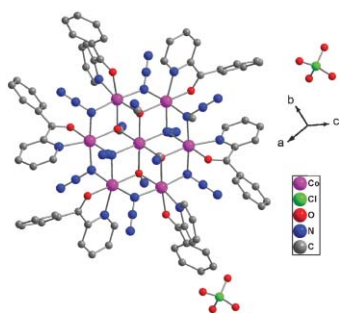


Unusually high stability of a poly(alkylquaterthiophene-*alt*-oxadiazole) conjugated copolymer in its n and p-doped states

Mikhael D. Levi,* Alexander S. Fisyuk,
Renaud Demadrille, Elena Markevich, Yossi Gofer,
Doron Aurbach and Adam Pron*

Incorporation of electron accepting units (oxadiazole) into the 2,5-thienylene conjugated chain leads to a significant improvement in the n-doping/undoping redox stability of the resulting polymer.

3302

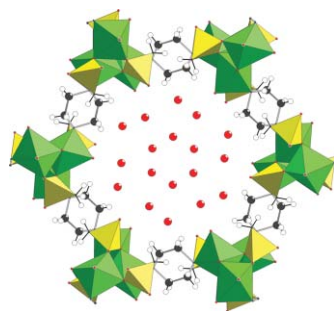


An azido-bridged disc-like heptanuclear cobalt(II) cluster: towards a single-molecule magnet

Yuan-Zhu Zhang, Wolfgang Wernsdorfer, Feng Pan,
Zhe-Ming Wang and Song Gao*

A novel disc-like heptanuclear Co(II)-cluster, [Co₇(bzip)₆(N₃)₉(CH₃O)₃]·2ClO₄·2H₂O (**1**) (bzip = 2-benzoyl pyridine), mixed-bridged by 3/4 azides ($\mu_{1,1}$ and $\mu_{1,1,1}$) and 1/4 $\mu_{1,1,1}$ -methanol, shows slow relaxation at static zero and non-zero fields below 6 K, towards single molecule magnet behavior.

3305



The first route to large pore metal phosphonates

John A. Groves, Stuart R. Miller, Stewart J. Warrender,
Caroline Mellot-Draznieks, Philip Lightfoot and
Paul A. Wright*

New open framework

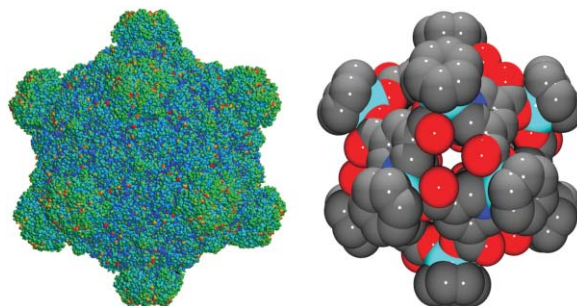
N,N'-piperazinebis(methylenephosphonate)s of Fe(II), Co(II) and Ni(II) show coordination of the ligand to the metal cations *via* both oxygen and nitrogen atoms. One structure shows high micropore volume and large pores and the framework cations display reversible coordination by water.

3308

Guest-induced formation of an icosahedral coordination cage

Thomas Brasey, Rosario Scopelliti and Kay Severin*

Shaped like a virus: a coordination cage with an elusive icosahedral geometry was obtained by K^+ -induced rearrangement of a hexanuclear [(cymene)Ru(pyridine-3,5-dicarboxylate)]₆ complex.

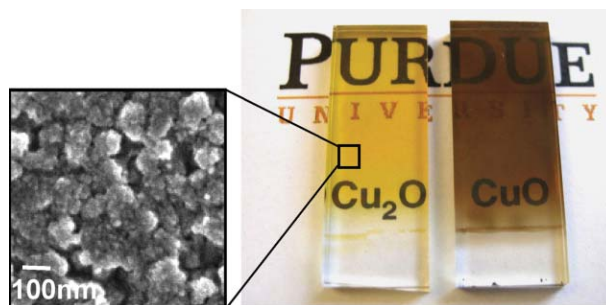


3311

Electrochemical synthesis and characterization of transparent nanocrystalline Cu₂O films and their conversion to CuO films

Kari E. R. Brown and Kyoung-Shin Choi*

Transparent nanocrystalline Cu₂O films ($E_g = 2.6$ eV) were electrodeposited from a dimethyl sulfoxide medium; these films exhibit interesting optical and photoelectrochemical properties, and can be converted to transparent CuO films.

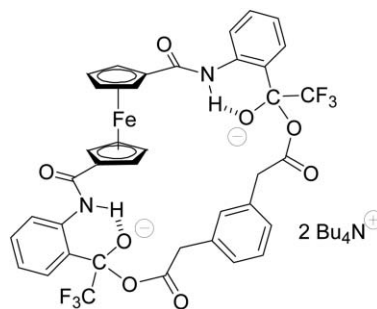


3314

Selective recognition and electrochemical sensing of dicarboxylates with a ferrocene-based bis(*o*-trifluoroacetylcarboxanilide) receptor

Dae-Sik Kim, Hidekazu Miyaji,* Byoung-Yong Chang, Su-Moon Park* and Kyo Han Ahn*

A neutral ferrocene-based ditopic receptor binds a dicarboxylate in a cooperative 1 : 1 binding mode, showing a very high affinity ($K = 1.6 \times 10^7$ M⁻¹ in acetonitrile at 303 K) and also a large negative shift in the redox potential.

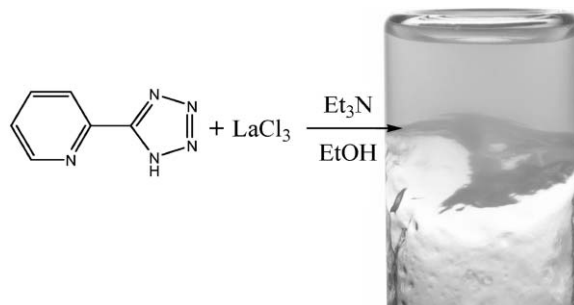


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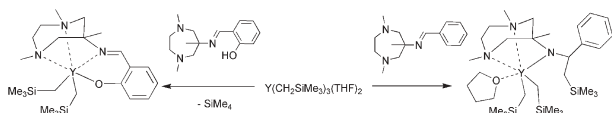
Gelation of La(III) cations promoted by 5-(2-pyridyl)tetrazolate and water

Philip C. Andrews,* Peter C. Junk, Massimiliano Massi and Morry Silberstein

Addition of water to the product formed when LaCl₃ and 1*H*-5-(2-pyridyl)tetrazole (LH) were treated with an excess of triethylamine in ethanol, resulted in the reversible formation of a hydrogel.



3320

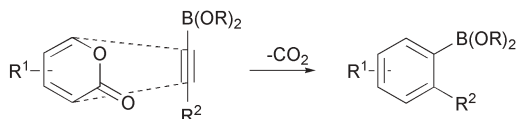


The 6-amino-6-methyl-1,4-diazepine group as an ancillary ligand framework for neutral and cationic scandium and yttrium alkyls

Shaoyong Ge, Sérgio Bambera, Auke Meetsma and Bart Hessen*

The 6-amino-6-methyl-1,4-diazepine framework is a readily available neutral 6-electron ligand moiety, suitable to support cationic group 3 metal alkyl catalysts; it also provides convenient access to tri- and tetradentate monoanionic ligand derivatives.

3323

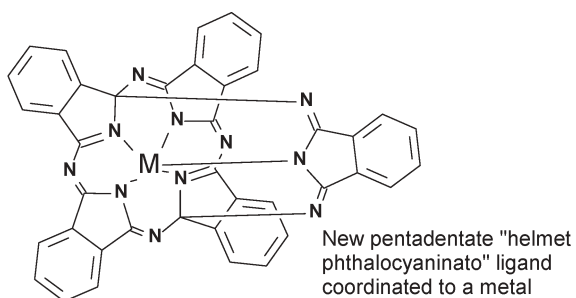


An alkynylboronic ester cycloaddition route to functionalised aromatic boronic esters

Patrick M. Delaney, Jane E. Moore and Joseph P. A. Harrity*

A series of functionalised aromatic boronic esters have been prepared *via* the regioselective cycloaddition of 2-pyrones with alkynylboronates.

3326

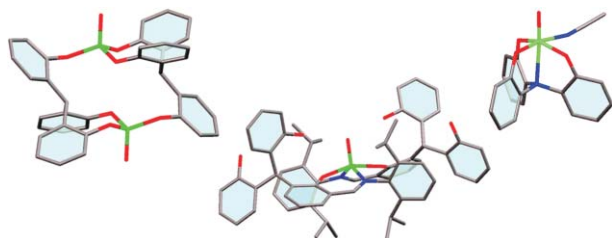


Racemic iron(III) and cobalt(III) complexes containing a new pentadentate "helmet" phthalocyaninato ligand

Heidi M. Kieler, Matthew J. Bierman, Ilia A. Guzei, Peter J. Liska and Robert W. McGaff*

Iron(III) and cobalt(III) complexes of an unprecedented "helmet" phthalocyaninato ligand are obtained as racemic mixtures in reactions of 1,2-dicyanobenzene with iron(II) acetate tetrahydrate and cobalt(II) acetate tetrahydrate, respectively.

3329



Vanadyl C and N-capped tris(phenolate) complexes: influence of pro-catalyst geometry on catalytic activity

Carl Redshaw,* Michael A. Rowan, Damien M. Homden, Sophie H. Dale, Mark R. J. Elsegood, Shigekazu Matsui and Sadahiko Matsuura

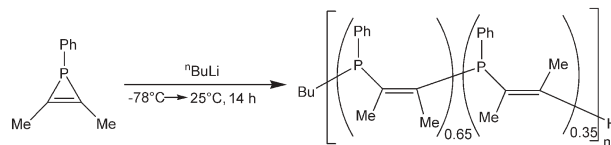
Tetrahedral vanadyl complexes of C or N-capped tripodal ligands serve as extremely active, thermally robust pro-catalysts for ethylene homo- and ethylene/propylene copolymerisation; related octahedral complexes produce far lower activities.

3332

Anionic ring-opening polymerization of a strained phosphirene: A route to polyvinylphosphines

Lawrence A. Vanderark, Timothy J. Clark, Eric Rivard, Ian Manners,* J. Chris Sloatweg and Koop Lammertsma*

An unsaturated organophosphorus polymer has been synthesized by the anionic ring-opening polymerization of 1-phenyl-2,3-dimethylphosphirene.

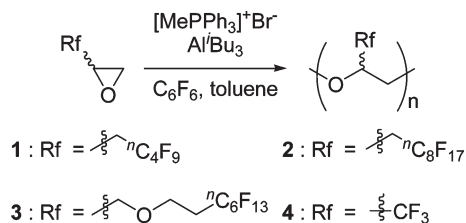


3334

Regio-controlled ring-opening polymerization of perfluoroalkyl-substituted epoxides

Ken Sakakibara, Koji Nakano and Kyoko Nozaki*

Various fluorinated epoxides were efficiently polymerized under mild conditions and the obtained polymers had an exclusive regioregular structure. When optically pure epoxides were used, isotactic polymers were obtained.

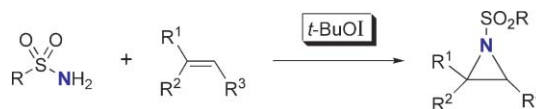


3337

Novel aziridination of olefins: direct synthesis from sulfonamides using *t*-BuOI

Satoshi Minakata,* Yoshinobu Morino, Yoji Oderaotoshi and Mitsuo Komatsu*

tert-Butyl hypoiodite (*t*-BuOI) was found to be a powerful reagent for synthesis of aziridines from readily accessible olefins and sulfonamides. This method of aziridination was superior in many aspects, for example, the use of commercially available starting materials, metal free synthesis and high stereoselectivity.

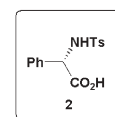
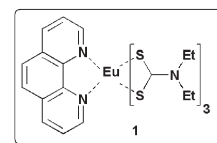
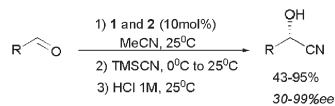


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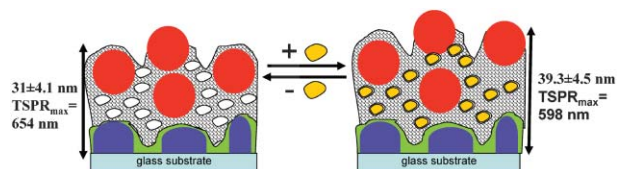
Eu(III) dithiocarbamate complex and *N*-*p*-tolylsulfonylphenylalanine as a novel chiral catalyst for the asymmetric synthesis of cyanohydrins

Juliana A. Vale,* Wagner M. Faustino, Paulo H. Menezes and Gilberto F. de Sá

A new chiral lanthanide complex was used as a chiral Lewis acid in the enantioselective addition of TMS-CN to aldehydes. In some cases, high enantioselectivities were observed.



3343

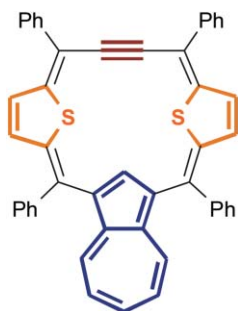


Ultrathin molecularly imprinted polymer sensors employing enhanced transmission surface plasmon resonance spectroscopy

Iryna Tokareva, Ihor Tokarev, Sergiy Minko,*
Eliza Hutter and Janos H. Fendler*

A 31.5 ± 4.1 nm thick nanosensor, employing a molecularly imprinted polymer (MIP) for recognition of cholesterol and the use of gold nanoparticle enhanced transmission surface plasmon resonance (T-SPR) spectroscopy for detection is described.

3346

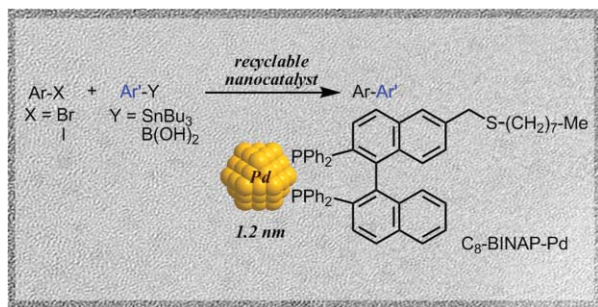


Dithiaethyneazuliporphyrin - a contracted heterocarbaporphyrin

Anna Berlicka, Natasza Sprutta and
Lechosław Latos-Grażyński*

Fusion of three different structural motifs: acetylene, azulene and thiophene moieties in the [18]dithiacarbatriphyrin(4.1.1) frame yields the contracted carbaporphyrinoid dithiaethyneazuliporphyrin.

3349

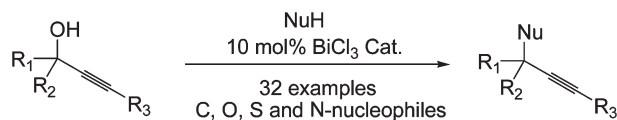


Synthesis of small palladium nanoparticles stabilized by bisphosphine BINAP bearing an alkyl chain and their palladium nanoparticle-catalyzed carbon-carbon coupling reactions under room-temperature

Ryouta Tatumi, Tomoki Akita and Hisashi Fujihara*

A new protecting ligand, C₈-BINAP, induced the formation of remarkably stable palladium nanoparticles (C₈-BINAP-Pd). C₈-BINAP-Pd catalyzed carbon-carbon coupling reactions at room temperature.

3352



BiCl₃-Catalyzed propargylic substitution reaction of propargylic alcohols with C-, O-, S- and N-centered nucleophiles

Zhuang-ping Zhan,* Wen-zhen Yang, Rui-feng Yang,
Jing-liang Yu, Jun-ping Li and Hui-juan Liu

A general and efficient BiCl₃-catalyzed substitution reaction of propargylic alcohols with carbon and heteroatom-centered nucleophiles such as allyl trimethylsilane, alcohols, aromatic compounds, thiols and amides, leading to the construction of C-C, C-O, C-S and C-N bonds, has been developed.

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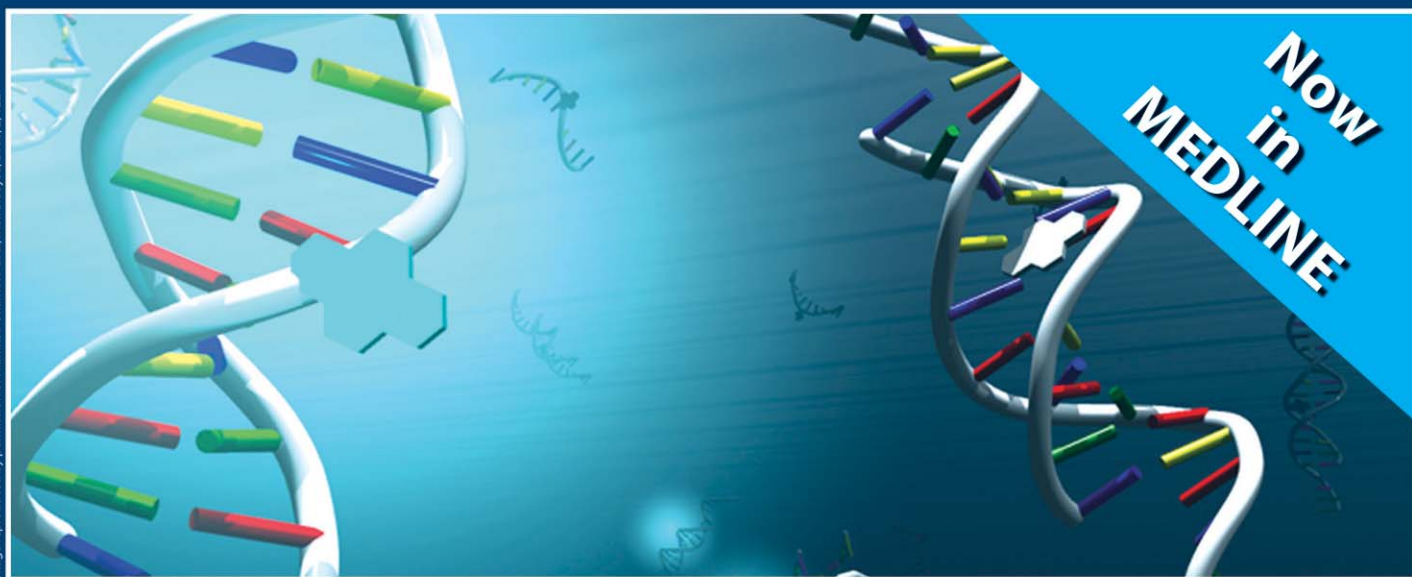
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