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# Organic & Biomolecular Chemistry

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**PAPER**

Robert A. Field, David A. Russell *et al.*  
Glyconanoparticles for the plasmonic detection and discrimination between human and avian influenza virus



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# Organic & Biomolecular Chemistry

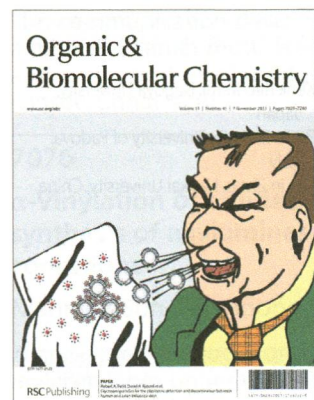
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## IN THIS ISSUE

ISSN 1477-0520 CODEN OBCRAK 11(41) 7029–7240 (2013)

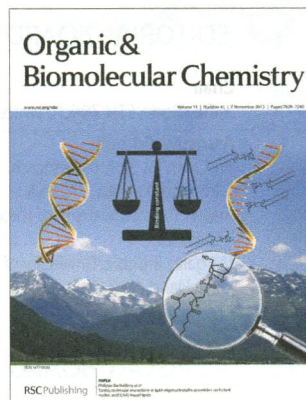


### Cover

See Robert A. Field, David A. Russell *et al.*, pp. 7101–7107.

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The authors are extremely grateful to Miss Susan van der Heide (School of Chemistry, University of East Anglia) for her design and production of the cover.



### Inside cover

See Philippe Barthélémy *et al.*, pp. 7108–7112.

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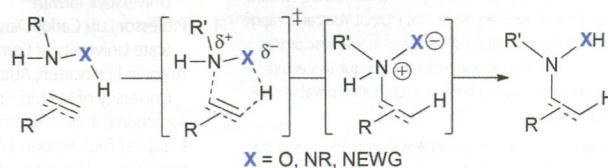
## EMERGING AREA

7039

### Recent developments in Cope-type hydroamination reactions of hydroxylamine and hydrazine derivatives

André M. Beauchemin

Concerted, metal-free hydroaminations allow difficult cyclizations, intermolecular reactions and directed variants; highly efficient aldehyde-catalysed stereoselective reactions are possible.



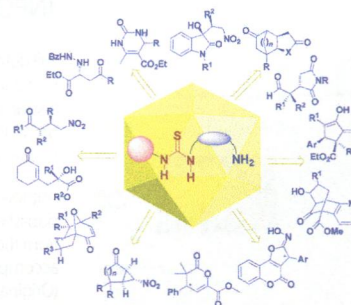
## PERSPECTIVE

7051

### Bifunctional primary amine-thioureas in asymmetric organocatalysis

Olga V. Serdyuk, Christina M. Heckel and Svetlana B. Tsogoeva\*

This perspective illustrates recent progress in organic synthesis using different chiral primary amine-thiourea organocatalysts with a focus on C–C, C–O and C–N bond formation reactions.

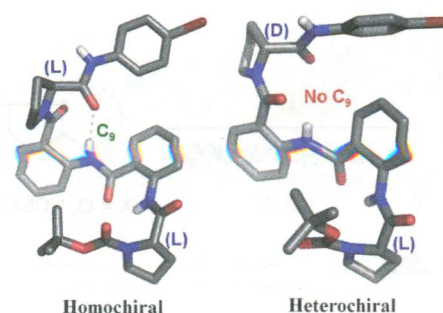




### Switching the H-bonding network of a foldamer by modulating the backbone chirality and constitutional ratio of amino acids

Veera V. E. Ramesh, Kuruppanthara N. Vijayadas,  
Snehal Dhokale, Rajesh G. Gonnade,  
Pattuparambil R. Rajamohanan and  
Gangadhar J. Sanjayan\*

This communication describes the folding propensity of a heterofoldamer motif featuring proline (Pro) and anthranilic acid (Ant) residues in a 1 : 2 : 1 ( $\alpha$  :  $\beta$  :  $\alpha$ ) constitutional ratio.

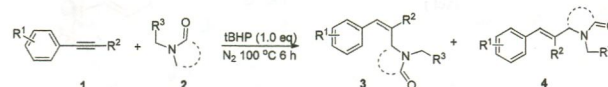


7076

### $\alpha$ -Vinylolation of amides with arylacetylenes: synthesis of allylamines under metal-free conditions

Manman Sun, Huandong Wu and Weiliang Bao\*

A novel methodology for the  $\alpha$ -vinylolation of amides with arylacetylenes under metal-free conditions has been introduced. This methodology provides a new protocol to synthesize allylamines. In each product, the amount of the *cis*-isomer was more than that of the *trans*-isomer.

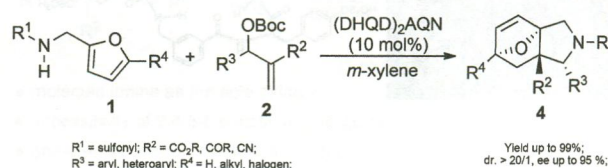


7080

### Lewis base catalyzed asymmetric substitution/Diels–Alder cascade reaction: a rapid and efficient construction of enantioenriched diverse tricyclic heterocycles

Gong-Feng Zou, Feng Pan and Wei-Wei Liao\*

The first tertiary amine-catalyzed asymmetric allylic amination/cycloaddition cascade sequence has been developed, which provided a facile access to enantioenriched azapolyheterocycles under mild reaction conditions efficiently (up to 95% ee, *endo/exo* >20 : 1).

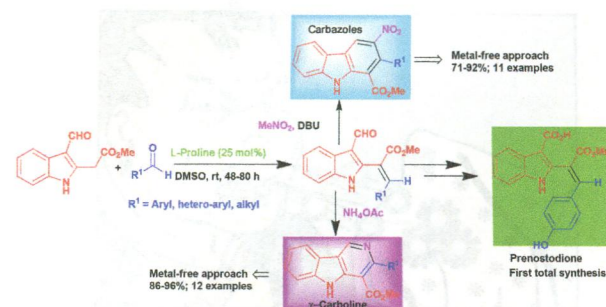


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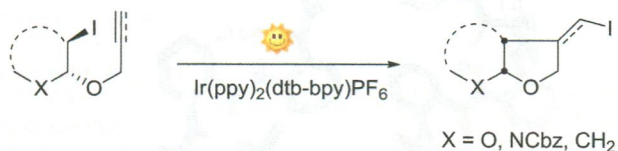
### L-Proline catalyzed stereoselective synthesis of (*E*)-methyl- $\alpha$ -indol-2-yl- $\beta$ -aryl/alkyl acrylates: easy access to substituted carbazoles, $\gamma$ -carbolines and prenostodione

Soumen Biswas, Pradeep Kumar Jaiswal,  
Shivendra Singh, Shaikh M. Mobin and  
Sampak Samanta\*

A L-proline catalyzed condensation reaction of methyl 2-(3-formyl-1*H*-indol-2-yl)acetate with several aldehydes providing predominantly (*E*)-methyl  $\alpha$ -(3-formyl-1*H*-indol-2-yl)- $\beta$ -aryl/alkyl-substituted acrylates in high yields has been presented.



7088

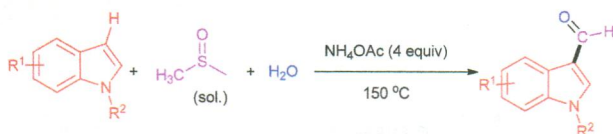


### Visible light photoredox atom transfer Ueno–Stork reaction

Xiangyong Gu, Ping Lu, Weigang Fan, Pixu Li\* and Yingming Yao\*

A visible light-promoted atom transfer Ueno–Stork reaction was developed using  $\text{Ir(ppy)}_2(\text{dtb-bpy})\text{PF}_6$  as the sensitizer. 2-Iodoethyl propargyl ethers or 2-iodoethyl allyl ethers were used as the radical precursors to construct tetrahydrofuran-containing fused [6,5] and [5,5] bicyclic frameworks.

7092

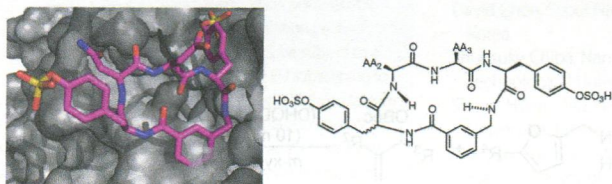


### The ammonium-promoted formylation of indoles by DMSO and H<sub>2</sub>O

Haiyang Fei, Jintao Yu, Yan Jiang, Huan Guo and Jiang Cheng\*

DMSO and H<sub>2</sub>O is an efficient combination in the  $\text{NH}_4\text{OAc}$ -promoted formylation of indole, where DMSO serves as a C1 carbon source.

7096



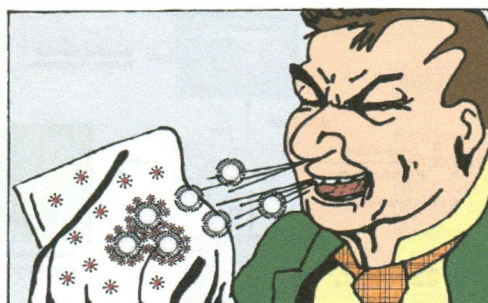
### Template-constrained cyclic sulfopeptide HIV-1 entry inhibitors

Jonathan G. Rudick,\* Meg M. Laakso,\* Ashley C. Schloss and William F. DeGrado

Three rationally designed cyclic sulfopeptides were identified as inhibitors of HIV-1 entry and complement the activity of known CCR5 antagonists.

## PAPERS

7101



### Glyconanoparticles for the plasmonic detection and discrimination between human and avian influenza virus

María J. Marín, Abdul Rashid, Martin Rejzek, Shirley A. Fairhurst, Stephen A. Wharton, Stephen R. Martin, John W. McCauley, Thomas Wileman, Robert A. Field\* and David A. Russell\*

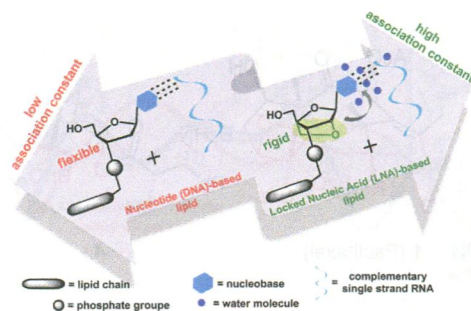
Glyconanoparticles for the plasmonic detection of influenza virus.

7108

### Tuning molecular interactions in lipid-oligonucleotides assemblies via locked nucleic acid (LNA)-based lipids

Amit Patwa, Gilmar Salgado, François Dole, Laurence Navailles and Philippe Barthélémy\*

Nucleolipids containing locked nucleic acid (LNA) allow the formation of stable complexes with complementary single strand RNAs.

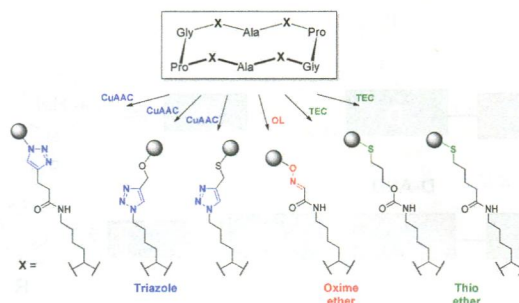


7113

### Tetravalent glycocyclopeptide with nanomolar affinity to wheat germ agglutinin

Michele Fiore, Nathalie Berthet, Alberto Marra, Emilie Gillon, Pascal Dumy, Alessandro Dondoni, Anne Imberty\* and Olivier Renaudet\*

A series of tetravalent glycocyclopeptides functionalized with GlcNAc was synthesized using copper(I)-catalysed alkyne-azide cycloaddition, oxime ligation and thiol-ene coupling. Nanomolar affinity to WGA was observed with the derivative having the allyloxycarbonyl spacer and the S-glycoside.

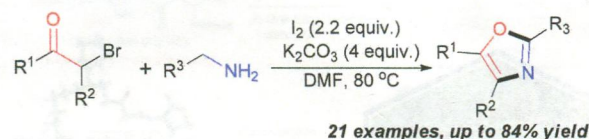


7123

### Practical oxazole synthesis mediated by iodine from $\alpha$ -bromoketones and benzylamine derivatives

Wen-Chao Gao, Ruo-Lin Wang and Chi Zhang\*

The reagent system of  $I_2/K_2CO_3$  could efficiently promote the oxazole synthesis from  $\alpha$ -bromoketones and benzylamine derivatives in DMF.



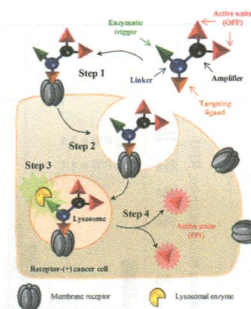
- ◆ molecule iodine as the sole oxidant
- ◆ accessibility of 2,4,5-trisubstituted oxazoles and 5-alkyl/alkenyl oxazoles
- ◆ one-step synthesis of a natural product halfordinol

7129

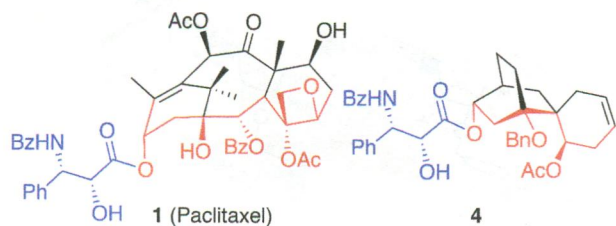
### An enzyme-responsive system programmed for the double release of bioactive molecules through an intracellular chemical amplification process

Marion Grinda, Thibaut Legigan, Jonathan Clarhaut, Elodie Peraudeau, Isabelle Tranoy-Opalinski, Brigitte Renoux, Mikael Thomas, François Guilhot and Sébastien Papot\*

We developed the first molecular system programmed for the selective internalization and subsequent enzyme-catalyzed double release of bioactive compounds.



7134

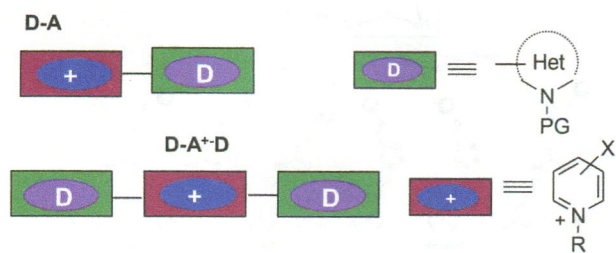


### Spiro-bicyclo[2.2.2]octane derivatives as paclitaxel mimetics. Synthesis and toxicity evaluation in breast cancer cell lines

Sophie Manner,\* Viveca T. Oltner, Stina Oredsson, Ulf Ellervik\* and Torbjörn Frejd

Double Michael addition and ring-closing metathesis were used to synthesize spiro-bicyclo[2.2.2]octane derivatives as paclitaxel mimetics, tested in human breast derived cancer cell lines.

7145

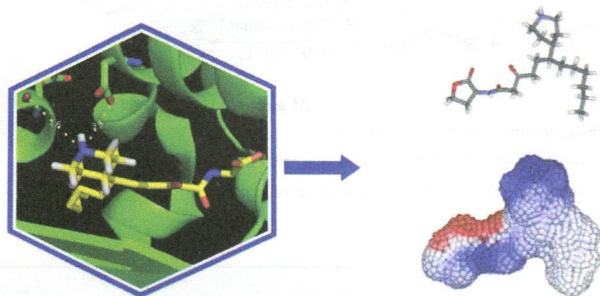


### Synthesis of charged bis-heteroaryl donor-acceptor (D-A<sup>+</sup>) NLO-phores coupling ( $\pi$ -deficient- $\pi$ -excessive) heteroaromatic rings

Marco Antonio Ramirez, Raul Custodio, Ana M. Cuadro,\* Julio Alvarez-Builla, Koen Clays, Inge Asselberghs, Francisco Mendicuti, Obis Castaño, José L. Andrés and Juan J. Vaquero\*

Push-pull D-A<sup>+</sup>(D) charged chromophores with NLO properties were synthesized by Stille cross-coupling reaction combining heteroaromatic cations as acceptor units (A<sup>+</sup>) with  $\pi$ -excessive *N*-heterocycles as donor units (D).

7155

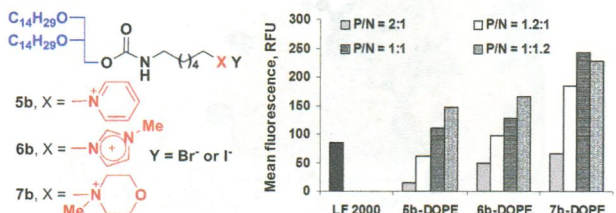


### Tailor-made LasR agonists modulate quorum sensing in *Pseudomonas aeruginosa*

Nira Rabin, Antonia Delago, Boaz Inbal, Pnina Krief and Michael M. Meijler\*

Computational analysis allowed the design and synthesis of *N*-acyl homoserine lactones containing a piperidine moiety, predicted to fit well into a cavity within the LasR receptor of *Pseudomonas aeruginosa*. The evaluation of their activity in modulating quorum sensing showed remarkable agonist and synergistic effects.

7164



### Structure-transfection activity relationships in a series of novel cationic lipids with heterocyclic head-groups

Ekaterina A. Ivanova, Mikhail A. Maslov,\* Tatyana O. Kabilova, Pavel A. Puchkov, Anna S. Alekseeva, Ivan A. Boldyrev, Valentin V. Vlassov, Galina A. Serebrennikova, Nina G. Morozova and Marina A. Zenkova

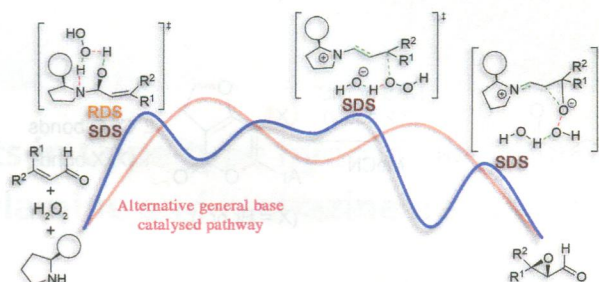
Transfection activity of novel carbamate-type cationic lipids was investigated.

7179

### A computational study on the stereoselective organocatalytic epoxidation of $\alpha,\beta$ -unsaturated aldehydes with hydrogen peroxide

Filipe J. S. Duarte and A. Gil Santos\*

The epoxidation of conjugated aldehydes by hydrogen peroxide catalysed by secondary amines occurs *via* an iminium intermediate, which is also one of the selectivity determining steps of the reaction.

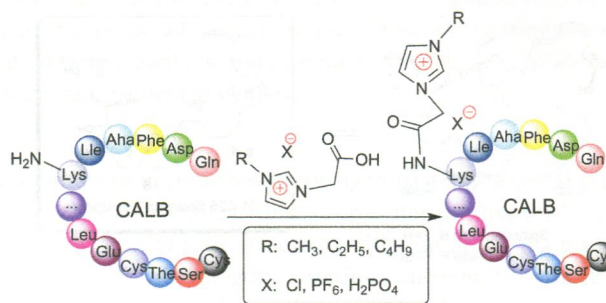


7192

### Chemical modification for improving activity and stability of lipase B from *Candida antarctica* with imidazolium-functional ionic liquids

Ru Jia, Yi Hu,\* Luo Liu, Ling Jiang and He Huang\*

Chemical modification with functional ionic liquids onto CALB achieved great catalytic performance, a feasible methodology developing novel and efficient biocatalysts.

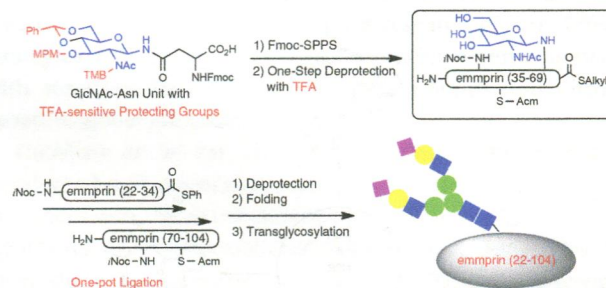


7199

### Fast preparation of an *N*-acetylglucosaminylated peptide segment for the chemoenzymatic synthesis of a glycoprotein

Yuya Asahina, Mika Kanda, Akemi Suzuki, Hidekazu Katayama, Yoshiaki Nakahara and Hironobu Hojo\*

A novel GlcNAc-Asn unit carrying trifluoroacetic acid (TFA)-sensitive *O*-protecting groups was prepared.

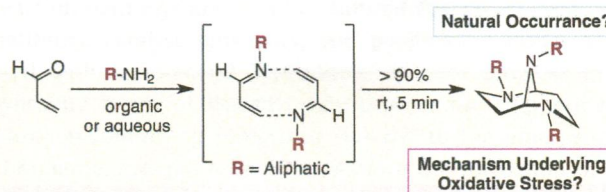


7208

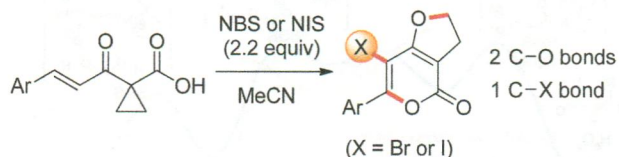
### 2,6,9-Triazabicyclo[3.3.1]nonanes as overlooked amino-modification products by acrolein

Ayumi Tsutsui and Katsunori Tanaka\*

The reaction of several primary amines with acrolein smoothly provided the corresponding 2,6,9-triazabicyclo[3.3.1]nonanes through a formal [4 + 4] reaction of the intermediary unsaturated imines.



7212

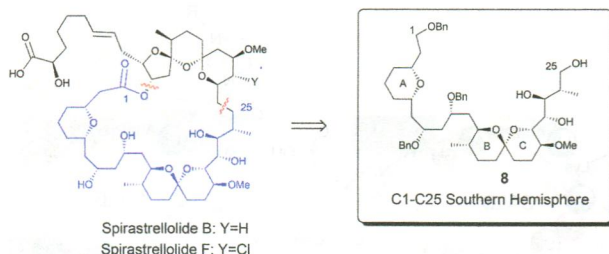


### Halonium-initiated double oxa-cyclization cascade as a synthetic strategy for halogenated furo[3,2-c]pyran-4-ones

Enxiang Wei, Bing Liu, Shaoxia Lin, Baozhong Zhao\* and Fushun Liang\*

Biologically interesting 7-halogenated furo[3,2-c]pyran-4-ones were prepared by the one-pot reaction of 1-alkenylcyclopropane carboxylic acids with NBS or NIS via a catalyst-free double oxa-cyclization cascade.

7218

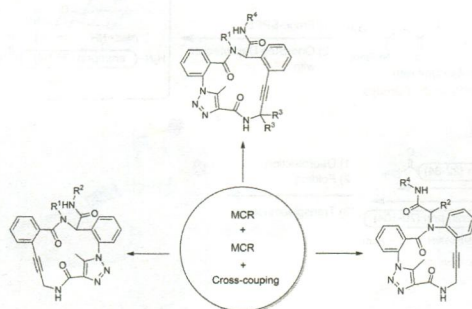


### Synthesis of the C1-C25 southern domain of spirastrellolides B and F

Gowravaram Sabitha,\* Allu Senkara Rao and J. S. Yadav

Synthesis of the C1-C25 ABC spiroketal ring system of spirastrellolides B and F has been executed. The synthetic strategy relied on radical cyclization, HWEOlefin, (BDP)CuH conjugate reduction and spiro acetalization reactions.

7232



### Synthesis of highly functionalized macrocycles by tandem multicomponent reactions and intramolecular Sonogashira cross-coupling

Teng-fei Niu, Mu Sun, Mei-fang Lv, Wen-bin Yi and Chun Cai\*

An efficient process for the synthesis of triazole-containing macrocycles has been described. This protocol was completed through a combination of two multicomponent reactions in a one-pot chemoselective process with an intramolecular palladium-catalyzed cross-coupling.

Faraday Discussion 163

## Photo-initiated Quantum Molecular Dynamics

15 - 17 April 2013, University of Nottingham, UK

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