

REVELERIS®

FLASH Chromatography System

Since the introduction of the Reveleris® flash system in 2009, many scientists are discovering the benefits of its advanced features and multi-detector capabilities to streamline discovery purification. Explore how the Reveleris® flash system can be used in a diverse range of challenging application areas, and how its patented technologies are changing the game in flash chromatography.

Application Areas

- Natural Products
- Proteins and Peptides
- Foods, Flavors and Agriculture
- Lipids
- Organic Synthesis
- Carbohydrates



Natural Product Related Articles:



Semisynthesis of Natural Flavones Inhibiting Tubulin Polymerization, from Hesperidin

Guy Lewin, Alexandre Maciuk, Sylviane Thoret, Genevieve Aubert, Joëlle Dubois, and Thierry Cresteil

Journal of Natural Products 2010 73 (4), 702-706

Abstract: Semi synthesis of 5,3'-dihydroxy-3,6,7,8,4'-pentamethoxyflavone (1), a natural flavone that binds with high affinity to tubulin, was performed from hesperidin, the very abundant Citrus flavanone, by a five-step sequence. The last step of the synthesis also gave rise to 5,3'-dihydroxy-3,6,7,4'-tetramethoxyflavone () casticin or vitexicarpin (10), 5,3'-dihydroxy-3,7,8,4'-tetramethoxyflavone () gossypetin 3,7,8,4'-tetramethyl ether (11), and, unexpectedly, 5,7,3'-trihydroxy-3,6,8,4'-tetramethoxyflavone (12) and 5,3'-dihydroxy-8-dimethylamino-3,6,7,4'-tetramethoxyflavone () 8-dimethylaminocasticin (13). Cytotoxicity and antitubulin activity of these five flavones, as well as 5,3'-dihydroxy-3,7,4'-trimethoxyflavone () ayanin (14) and intermediate 6,8-dibromo-ayanin (8), were evaluated. Comparison of the responses confirmed and clarified the influence of the A-ring substitution pattern on the biological activity.

To purchase a copy of this article, [Click Here](#)

New Betulinic Acid Derivatives as Potent Proteasome Inhibitors

Keduo Qian, Sang-Yong Kim, Hsin-Yi Hung, Li Huang, Chin-Ho Chen, Kuo-Hsiung Lee

Bioorganic & Medicinal Chemistry Letters 21 (2011) 5944-5947

Abstract: In this study, 22 new betulinic acid (BA) derivatives were synthesized and tested for their inhibition of the chymotrypsin-like activity of 20S proteasome. From the SAR study, we concluded that the C-3 and C-30 positions are the pharmacophores for increasing the proteasome inhibition effects, and larger lipophilic or aromatic side chains are favored at these positions. Among the BA derivatives tested, compounds 13, 20, and 21 showed the best proteasome inhibition activity with IC₅₀ values of 1.42, 1.56, and 1.80 μM, respectively, which are three to fourfold more potent than the proteasome inhibition controls LLM-F and lactacystin.

To purchase a copy of this article, [Click Here](#)

Extraction, Fractionation and Bioactivity of *Bombax Malabaricum* DC. PrickLes

CK Angerhofer, T Thompson, P Kiehne

Planta Medica 2012; 78 - PL32 (abstract only)

Abstract: *Bombax malabaricum* has an extensive history of medicinal use as it plays a significant role in both Traditional Chinese Medicine and Ayurveda. Modern research continues to evaluate every plant part for its therapeutic benefit with the exception of the prickles. Prickles have been traditionally used as a paste in the treatment of skin eruptions. This ethnomedicinal use suggests the potential presence of antimicrobial activity against *P. acnes*, and as microbial resistance has become more prevalent, the discovery of new antimicrobials is an important and necessary endeavor in order to combat this growing trend. In an effort to further elucidate the beneficial properties of this important plant, prickles from the tree bark of *Bombax malabaricum* were both extracted and fractionated using the automated Reveleris Flash Chromatography System. Classes of compounds identified include flavonoids, sterols, and triterpenes through HPLC/MS and the CAMAG TLC System. A procyanidin-rich fraction demonstrated the strongest antioxidant, anti-inflammatory, and antimicrobial activity against *P. acnes*. This finding is consistent with the literature with regard to radical scavenging ability and the inhibition of 5-lipoxygenase; however, procyanidins have yet to be evaluated for *P. acnes* activity.

To purchase a copy of this article, [Click Here](#)

Parsing a Multifunctional Biosynthetic Gene Cluster from Rice: Biochemical Characterization of CYP71Z6 & 7

Yisheng Wu, Matthew L. Hillwig, Qiang Wang, Reuben J. Peters

FEBS Letters, Volume 585, Issue 21, 4 November 2011, Pages 3446-3451

Abstract: Rice (*Oryza sativa*) contains a biosynthetic gene cluster associated with production of at least two groups of diterpenoid phytoalexins, the antifungal phytocassanes and antibacterial oryzalides. While cytochromes P450 (CYP) from this cluster are known to be involved in phytocassane production, such mono-oxygenase activity relevant to oryzalide biosynthesis was unknown. Here we report biochemical characterization demonstrating that CYP71Z6 from this cluster acts as an ent-isokaurene C2-hydroxylase that is presumably involved in the biosynthesis of oryzalides. Our results further suggest that the closely related and co-clustered CYP71Z7 likely acts as a C2-hydroxylase involved in a latter step of phytocassane biosynthesis. Thus, CYP71Z6 & 7 appear to have evolved distinct roles in rice diterpenoid metabolism, offering insight into plant biosynthetic gene cluster evolution.

To purchase a copy of this article, [Click Here](#)

A Single Residue Change Leads to a Hydroxylated Product from the Class II Diterpene Cyclization Catalyzed by Abietadiene Synthase

Jared Criswell, Kevin Potter, Freya Shephard, Michael H. Beale, and Reuben J. Peters

Organic Letters 2012 14 (23), 5828-5831

Abstract: Class II diterpene cyclases catalyze bicyclization of geranylgeranyl diphosphate. While this reaction typically is terminated via methyl deprotonation to yield copalyl diphosphate, in rare cases hydroxylated bicycles are produced instead. Abietadiene synthase is a bifunctional diterpene cyclase that usually produces a copalyl diphosphate intermediate. Here it is shown that substitution of aspartate for a conserved histidine in the class II active site of abietadiene synthase leads to selective production of 8r-hydroxy-CPP instead, demonstrating striking plasticity.

To purchase a copy of this article, [Click Here](#)

Antifungal Agents from *Pseudallescheria boydii* SNB-CN73 Isolated from a *Nasutitermes* sp. Termite

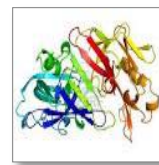
Charlotte Nirma, Veronique Eparvier, Didier Stien

Journal of Natural Products 2013, 76, 988-991

Defense mutualisms between social insects and microorganisms have been described in the literature. The present article describes the discovery of a *Pseudallescheria boydii* strain isolated from *Nasutitermes* sp. The microbial symbiont produces two antifungal metabolites: tyroscherin and *N*-methyltyroscherin, a compound not previously described in the literature. Methylation of tyroscherin has confirmed the structure of *N*-methyltyroscherin. Both compounds are effective antifungal agents with favorable selectivity indices for *Candida albicans* and *Trichophyton rubrum*.

To purchase a copy of this article, [Click Here](#)

Protein and Peptide Related Articles:



Fluorescence Labeling of Amino Acids and Peptides with 7-Aminocoumarins

Lisa Wirtz, Dagmar Auerbach, Gregor Jung, Uli Kazmaier*

Synthesis 2012 44(13): 2005-2012

Abstract: Pechmann condensation is a straightforward protocol for the synthesis of alkynyl- and azido-substituted 7-(dialkylamino) coumarins, which can be coupled to amino acid and peptide derivatives by copper-catalyzed [3+2]-cycloaddition (click reaction) in high yield. This allows the introduction of these efficient fluorescence labels into biologically relevant molecules.

To purchase a copy of this article, [Click Here](#)

Rapid and Orthogonal Logic Gating with a Gibberellin-induced Dimerization System

Takafumi Miyamoto, Robert DeRose Allison Suarez, Tasuku Ueno, Melinda Chen, Tai-ping Sun, Michael J Wolfgang, Chandrani Mukherjee, David J Meyers & Takanari Inoue

Nature Chemical Biology 2012

Abstract: Using a newly synthesized gibberellin analog containing an acetoxymethyl group (GA3-AM) and its binding proteins, we developed an efficient chemically inducible dimerization (CID) system that is completely orthogonal to existing rapamycin-mediated protein dimerization. Combining the two systems should allow applications that have been difficult or impossible with only one CID system. By using both chemical inputs (rapamycin and GA3-AM), we designed and synthesized Boolean logic gates in living mammalian cells. These gates produced output signals such as fluorescence and membrane ruffling on a timescale of seconds, substantially faster than earlier intracellular logic gates. The use of two orthogonal dimerization systems in the same cell also allows for finer modulation of protein perturbations than is possible with a single dimerizer.

To purchase a copy of this article, [Click Here](#)

Rotaxanes and Biofunctionalized Pseudorotaxanes via Thiol-Maleimide Click Chemistry

Umesh Choudhary and Brian H. Northrop

Organic Letters 2012 14 (8), 2082-2085

Abstract: Base-catalyzed thiol-maleimide click chemistry has been applied to the synthesis of neutral donor-acceptor [2]rotaxanes in good yield. This method is extended further to the synthesis of a glutathione-functionalized [2]pseudorotaxane, a precursor to integrated conjugates of interlocked molecules with proteins and enzymes.

To purchase a copy of this article, [Click Here](#)

Foods, Flavors and Agriculture Related Articles:



Efficacy of Food Proteins as Carriers for Flavonoids

Maxime C. Bohin, Jean-Paul Vincken, Harry T. W. M. van der Hijden, and Harry Gruppen

Journal of Agricultural and Food Chemistry 2012 60 (16), 4136-4143

Abstract: Enrichment of flavonoids in food is often limited by their off-tastes, which might be counteracted by the use of food proteins as carriers of flavonoids. Various milk proteins, egg proteins, and gelatin hydrolysates were compared for their binding characteristics to two flavan-3-ols. Among the proteins tested for their affinities toward epigallocatechin gallate (EGCG), β -casein and gelatin hydrolysates, in particular fish gelatin, were found to be the most promising carriers with an affinity on the order of 10^4 M⁻¹. A flexible open structure of proteins, as present in random coil proteins, was found to be important. The saturation of binding observed at high flavonoid/protein ratios was used to estimate the maximal binding capacity of each protein. To reach a daily intake of EGCG that has been associated with positive health effects, only 519 mg of gelatin B and 787 mg of β -casein were required to complex EGCG on the basis of their maximal binding capacity. When the absence of turbidity is taken into account, β -casein prevails as carrier. Three selected proteins were further investigated for their binding potential of representative flavonoids differing in their C-ring structure. An increase in hydrophobicity of flavonoids was related to a higher affinity for proteins, and the presence of a gallic acid ester on the C-ring showed an overall higher affinity.

KEYWORDS: flavonoid-protein interaction, β -casein, gelatin, EGCG, galloylation, ultrafiltration, ITC

To purchase a copy of this article, [Click Here](#)

Inhibition of Enzymatic Browning of Chlorogenic Acid by Sulfur-Containing Compounds

Tomas F. M. Kuijpers, Carlos-Eduardo Narváez-Cuenca, Jean-Paul Vincken, Anniewieke J. W. Verloop, Willem J. H. van Berkel, and Harry Gruppen

Journal of Agricultural and Food Chemistry 2012 60 (13), 3507-3514

Abstract: The antibrowning activity of sodium hydrogen sulfite (NaHSO₃) was compared to that of other sulfur-containing compounds. Inhibition of enzymatic browning was investigated using a model browning system consisting of mushroom tyrosinase and chlorogenic acid (5-CQA). Development of brown color (spectral analysis), oxygen consumption, and reaction product formation (RP-UHPLC-PDA-MS) were monitored in time. It was found that the compounds showing antibrowning activity either prevented browning by forming colorless addition products with o-quinones of 5-CQA (NaHSO₃, cysteine, and glutathione) or inhibiting the enzymatic activity of tyrosinase (NaHSO₃ and dithiothreitol). NaHSO₃ was different from the other sulfur-containing compounds investigated, because it showed a dual inhibitory effect on browning. Initial browning was prevented by trapping the o-quinones formed in colorless addition products (sulfochlorogenic acid), while at the same time, tyrosinase activity was inhibited in a time-dependent way, as shown by pre-incubation experiments of tyrosinase with NaHSO₃. Furthermore, it was demonstrated that sulfochlorogenic and cysteinylchlorogenic acids were not inhibitors of mushroom tyrosinase.

To purchase a copy of this article, [Click Here](#)

Potato and Mushroom Polyphenol Oxidase Activities Are Differently Modulated by Natural Plant Extracts

Tomas F. M. Kuijpers, Teunie Van Herk, Jean-Paul Vincken, Renske H. Janssen, Deborah L. Narh, Willem J. H. Van Berkel, and Harry Gruppen

Journal of Agricultural and Food Chemistry 2014, 62, 214-221

Abstract: Enzymatic browning is a major quality issue in fruit and vegetable processing and can be counteracted by different natural inhibitors. Often, model systems containing a single polyphenol oxidase (PPO) are used to screen for new inhibitors. To investigate the impact of the source of PPO on the outcome of such screening, this study compared the effect of 60 plant extracts on the activity of PPO from mushroom (*Agaricus bisporus*, AbPPO) and PPO from potato (*Solanum tuberosum*, StPPO). Some plant extracts had different effects on the two PPOs: an extract that inhibited one PPO could be an activator for the other. As an example of this, the mate (*Ilex paraguariensis*) extract was investigated in more detail. In the presence of mate extract, oxygen consumption by AbPPO was found to be reduced >5-fold compared to a control reaction, whereas that of StPPO was increased >9-fold. RP-UHPLC-MS analysis showed that the mate extract contained a mixture of phenolic compounds and saponins. Upon incubation of mate extract with StPPO, phenolic compounds disappeared completely and saponins remained. Flash chromatography was used to separate saponins and phenolic compounds. It was found that the phenolic fraction was mainly responsible for inhibition of AbPPO and activation of StPPO. Activation of StPPO was probably caused by activation of latent StPPO by chlorogenic acid quinones.

To purchase a copy of this article, [Click Here](#)

Lipid Related Articles:



Synthesis and Characterization of Betaine-like Diacyl Lipids: Zwitterionic Lipids with the Cationic Amine at the Bilayer Interface

Aditya G. Kohli, Colin L. Walsh, Francis C. Szoka

Chemistry and Physics of Lipids, Volume 165, Issue 2, February 2012, Pages 252-259

Abstract: We synthesized and characterized a series of zwitterionic, acetate-terminated, quaternized amine diacyl lipids (AQ). These lipids have an inverted headgroup orientation as compared to naturally occurring phosphatidylcholine (PC) lipids; the cationic group is anchored at the membrane interface, while the anionic group extends into the aqueous phase. AQ lipids preferentially interact with highly polarizable anions (ClO_4^-) over less polarizable ions (Cl^-), in accord with the Hofmeister series, as measured by the change in zeta potential of AQ liposomes. Conversely, AQ lipids have a weaker association with calcium than do PC lipids. The transition temperatures (T_m) of the AQ lipids are similar to the T_m observed with phosphatidylethanolamine (PE) lipids of the same chain length. AQ lipids form large lipid sheets after heating and sonication; however, in the presence of cholesterol (Chol), these lipids form stable liposomes that encapsulate carboxyfluorescein. The AQ:Chol liposomes retain their contents in the presence of serum at 37°C , and when injected intravenously into mice, their organ biodistribution is similar to that observed with PC:Chol liposomes. AQ lipids demonstrate that modulating the headgroup charge orientation significantly alters the biophysical properties of liposomes. For the drug carrier field, these new materials provide a non-phosphate containing zwitterlipid for the production of lipid vesicles.

To purchase a copy of this article, [Click Here](#)

The Gene Transfection Properties of a Lipophosphoramidate Derivative with Two Phytanyl Chains

Mattias F. Lindberg, Nathalie Carmoy, Tony Le Gall, Aurore Fraix, Mathieu Berchel, Christophe Lorilleux, Hélène Couthon-Gourvès, Pascale Bellaud, Alain Fautrel, Paul-Alain Jaffrès, Pierre Lehn, Tristan Montier

Biomaterials, Volume 33, Issue 26, September 2012, Pages 6240-6253

Abstract: Development of efficient and non-toxic gene delivery systems is among the most challenging requirements for successful gene therapy. Cationic lipophosphoramidates constitute a class of cationic lipids we have already shown to be efficient for in vivo gene transfer. Herein, we report the synthesis of a cationic lipophosphoramidate bearing two phytanyl chains (BSV18) as hydrophobic domain, and studied its gene transfection properties. In vitro, BSV18 exhibited a high transfection efficacy associated with a low cytotoxicity. ^{31}P NMR studies of various cationic lipophosphoramidates in water solution suggested that the phytanyl chains may favor the formation of an inverted hexagonal phase, a supramolecular arrangement which is presumed to enhance the endosomal escape and consequently increase the transfection efficiency. In vivo, systemic delivery of BSV18-based lipoplexes allowed a high efficiency of gene transfection into the mouse lung. With a view to clinical application, we evaluated not only the efficiency of lung transfection but also the eventual in vivo side-effects. Thus, in addition to monitoring the in vivo transfection efficiency by bioluminescent imaging and identifying by immunohistochemistry the cell types transfected, we also assessed in living animals the potential liver reaction as well as the inflammatory and immune responses induced by BSV18-mediated transfection. All those adverse effects were actually highly transient. Thus, taken together, these results indicate that lipophosphoramidates equipped with two phytanyl chains may have great potential for lung gene therapy, in particular for Cystic Fibrosis.

To purchase a copy of this article, [Click Here](#)

Inverse-Phosphocholine Lipids: A Remix of a Common Phospholipid

Emily K. Perttu, Aditya G. Kohli, and Francis C. Szoka, Jr.

Journal of the American Chemical Society 2012 134 (10), 4485-4488

Abstract: Zwitterionic inverse-phosphocholine (iPC) lipids contain headgroups with an inverted charge orientation relative to phosphocholine (PC) lipids. The iPC lipid headgroup has a quaternary amine adjacent to the bilayer interface and a phosphate that extends into the aqueous phase. Neutral iPC lipids with ethylated phosphate groups (CPe) and anionic iPC lipids nonethylated phosphate groups (CP) were synthesized. The surface potential of CPe liposomes remains negative across a broad pH range and in the presence of up to 10 mM Ca^{2+} . CP liposomes aggregate in the presence of Ca^{2+} , but at a slower rate than other anionic lipids. Hydrolysis of CP lipids by alkaline phosphatases generates a cationic lipid. CPe liposomes release encapsulated anionic carboxyfluorescein (CF) 20 times faster than PC liposomes and release uncharged glucose twice as fast as PC liposomes. As such, iPC lipids afford a unique opportunity to investigate the biophysical and bioactivity-related ramifications of a charge inversion at the bilayer surface.

To purchase a copy of this article, [Click Here](#)

Synthesis, Characterization, and Evaluation of Ionizable Lysine-Based Lipids for siRNA Delivery

Colin L. Walsh, Juliane Nguyen, Matthew R. Tiffany, and Francis C. Szoka

Bioconjugate Chemistry Article ASAP

Abstract: We report the synthesis and characterization of a series of ionizable lysine-based lipids (ILL), novel lipids containing a lysine headgroup linked to a long-chain dialkylamine through an amide linkage at the lysine α -amine. These ILLs contain two ionizable amines and a carboxylate, and exhibit pH-dependent lipid ionization that varies with lipid structure. The synthetic scheme employed allows for the simple, orthogonal manipulation of lipids. This provides a method for the development of a compositionally diverse library with varying ionizable headgroups, tail structures, and linker regions. A focused library of four ILLs was synthesized to determine the impact of hydrophobic fluidity, lipid net charge, and lipid $\text{pK}(\text{a})$ on the biophysical and siRNA transfection characteristics of this new class of lipids. We found that manipulation of lipid structure impacts the protonation behavior, electrostatically driven membrane disruption, and ability to promote siRNA mediated knockdown in vitro. ILL-siRNA liposomal formulations were tested in a murine Factor VII model; however, no significant siRNA-mediated knockdown was observed. These results indicate that ILL may be useful in vitro transfection reagents, but further optimization of this new class of lipids is required to develop an effective in vivo siRNA delivery system.

To purchase a copy of this article, [Click Here](#)

Aniline-Catalyzed Reductive Amination as a Powerful Method for the Preparation of Reducing End-“Clickable” Chitoooligosaccharides

Alexandre Guerry, Julien Bernard, Eric Samain, Etienne Fleury, Sylvain Cottaz, and Sami Halila

Bioconjugate Chemistry Article ASAP, 10.1021/bc3003716. March 2013

Abstract: Functionalized oligosaccharides are useful intermediates to prepare products for biological research or for the development of advanced functional materials. Here, we report the unprecedented use of aniline as an efficient organocatalyst reaction with “clickable” (azide or alkyne)amine for the transamination-mediated reductive amination of a chitoooligosaccharide. Moreover, we demonstrate that alkynebearing aniline constitutes an excellent tool for the easy derivatization of chitosan oligosaccharides. Evidence for such improvement has been illustrated by the straightforward design of a FRET substrate to probe chitinase activity and of amphiphilic polycaprolactone-grafted-chitosan. This efficient methodology paves the way to the preparation of novel chitosan oligosaccharide-based advanced materials..

To purchase a copy of this article, [Click Here](#)

Organic Synthesis Related Articles:



Radiolabelling and Evaluation of Novel Haloethylsulfoxides as PET Imaging Agents for Tumor Hypoxia

Evelyn Laurens, Shinn Dee Yeoh, Angela Rigopoulos, Diana Cao, Glenn A. Cartwright, Graeme J. O'Keefe, Henri J. Tochon-Danguy, Jonathan M. White, Andrew M. Scott, Uwe Ackermann

Nuclear Medicine and Biology, Volume 39, Issue 6, August 2012, Pages 871-882

Abstract: The significance of imaging hypoxia with the PET ligand $[^{18}\text{F}]\text{FMISO}$ has been demonstrated in a variety of cancers. However, the slow kinetics of $[^{18}\text{F}]\text{FMISO}$ require a 2-h delay between tracer administration and patient scanning. Labelled chloroethyl sulfoxides have shown faster kinetics and higher contrast than $[^{18}\text{F}]\text{FMISO}$ in a rat model of ischemic stroke. However, these nitrogen mustard analogues are unsuitable for routine production and use in humans. Here we report on the synthesis and in vitro and in vivo evaluation of two novel sulfoxides which we synthesised from a single precursor molecule via either 2- $[^{18}\text{F}]\text{fluoroethyl}$ azide click chemistry or conventional nucleophilic displacement of a chloride leaving group. The yields of the click chemistry approach were $90\pm 5\%$ of $[^{18}\text{F}]\text{2}$ based on 2- $[^{18}\text{F}]\text{fluoroethyl}$ azide, and the yields for the S_{N} reaction were $15\pm 5\%$ of $[^{18}\text{F}]\text{1}$ based on $\text{K}[^{18}\text{F}]\text{F}$. Both radiotracers underwent metabolism in an in vitro assay using S9 liver fractions with biological half-lives of 32.39 and 43.32 min, respectively. Imaging studies using an SK-RC-52 tumor model in BALB/c nude mice have revealed that only $[^{18}\text{F}]\text{1}$ is retained in hypoxic tumors, whereas $[^{18}\text{F}]\text{2}$ is cleared from those tumors at a rate similar to that of muscle tissue. $[^{18}\text{F}]\text{1}$ has emerged as a promising new lead structure for further development of sulfoxide-based hypoxia imaging agents. In particular, the mechanism of uptake needs to be elucidated and changes to the chemical structure need to be made in order to reduce metabolism and improve radiotracer kinetics.

To purchase a copy of this article, [Click Here](#)

Anti-AIDS Agents 90. Novel C-28 Modified Bevirimat Analogues as Potent HIV Maturation Inhibitors

Keduo Qian, Ibrahim D. Bori, Chin-Ho Chen, Li Huang, and Kuo-Hsiung Lee

Journal of Medicinal Chemistry 2012 55 (18), 8128-8136

Abstract: In a continuing study of bevirimat (2), the anti-HIV-maturation clinical trials agent, 28 new betulonic acid (BA, 1) derivatives were designed and synthesized. Among these compounds, 17, with a C-28 MEM ester moiety, and 22, with a C-28 ethyl hexanoate, increased the anti-HIV replication activity compared with 2 by 2-fold while compounds 40, 41, 48, and 49, with C-28 piperazine or piperidine amide substitutions, increased the activity by 3- to 15-fold. The best new compound, 41, exhibited an anti-HIV IC_{50} of $0.0059\ \mu\text{M}$ compared with $0.087\ \mu\text{M}$ for 2. All of the active compounds showed only antimaturation effects, as confirmed by TZM-bl assay, in blocking the HIV replication. The results suggest that proper C-28 substitutions can further enhance the antimaturation activity of 2 without any antientry effects. Thus, 41 may serve as a promising new lead for development of anti-AIDS clinical trial candidates.

To purchase a copy of this article, [Click Here](#)

Novel Synthesis of 5-Amino-3-bromo-1-(tert-butyl)-1H-pyrazole-4-carbonitrile: A Versatile Intermediate for the Preparation of 5-Amino-3-aryl-1-(tert-butyl)-1H-pyrazole-4-carboxamides

Mark A. Bobko, Arun C. Kaura, Karen A. Evans, and Dai-Shi Su

Organic Letters 2012 14 (15), 3906-3908

Abstract: A simple, novel, and efficient route for the synthesis of 5-amino-3-aryl-1-(tert-butyl)-1H-pyrazole-4-carboxamides 1 has been devised. Preparation of pyrazole bromide 3 from potassium tricyanomethanide can be accomplished in only two steps in good yield and features a selective Sandmeyer reaction on the corresponding diaminopyrazole. This allows for a more versatile synthesis of 5-amino-3-aryl-1-(tert-butyl)-1H-pyrazole-4-carboxamides 1 than was previously possible.

To purchase a copy of this article, [Click Here](#)

Concise Synthesis of Two β -Adrenergic Blocking Agents in High Stereoselectivity Using the Readily Available Chiral Building Block (2S,2'S,2''S)-Tris-(2,3-epoxypropyl)-isocyanurate

Swapnil P. Sonawane, Gulabrao D. Patil, and Mukund K. Gurjar

Organic Process Research & Development 2011 15 (6), 1365-1370

Abstract: A concise synthesis of (S)-propranolol and (S)-metoprolol in high stereoselectivity using the readily available chiral building block (2S,2'S,2''S)-tris-(2,3-epoxypropyl)-isocyanurate (S-TGT) as the key intermediate is described.

To purchase a copy of this article, [Click Here](#)

Identification, Synthesis, and Strategy For Minimization of Potential Impurities Observed In Raltegravir Potassium Drug Substance

Gulabrao D. Patil, Siddheshwar W. Kshirsagar, Shivnath B. Shinde, Pankaj S. Patil, Mangesh S. Deshpande, Ashok T. Chaudhari, Swapnil P. Sonawane, Golak C. Maikap, and Mukund K. Gurjar

Organic Process Research & Development 2012 16 (8), 1422-1429

Abstract: Multiple sources of anticipated degradation and process impurities of raltegravir potassium drug substance observed during the laboratory optimization and later during its bulk synthesis are described in this article. The impurities were monitored by UPLC, and their structures are tentatively assigned on the basis of fragmentation patterns in LC-MS and NMR spectroscopy. Most of the impurities are synthesized, and their assigned constitutions were confirmed by co-injection in UPLC. In addition to the formation, synthesis, and characterization, strategy for minimizing these impurities to the level accepted by ICH is also described. We feel that our study will be helpful to the generic industry for obtaining chemically pure raltegravir potassium.

To purchase a copy of this article, [Click Here](#)

Suite of Activity-Based Probes for Cellulose-Degrading Enzymes

Lacie M. Chauvigné-Hines, Lindsey N. Anderson, Holly M. Weaver, Joseph N. Brown, Phillip K. Koech, Carrie D. Nicora, Beth A. Hofstad, Richard D. Smith, Michael J. Wilkins, Stephen J. Callister, and Aaron T. Wright

Journal of the American Chemical Society 2012 134 (50), 20521-20532

Abstract: Microbial glycoside hydrolases play a dominant role in the biochemical conversion of cellulosic biomass to high-value biofuels. Anaerobic cellulolytic bacteria are capable of producing multicomplex catalytic subunits containing celladherent cellulases, hemicellulases, xylanases, and other glycoside hydrolases to facilitate the degradation of highly recalcitrant cellulose and other related plant cell wall polysaccharides. *Clostridium thermocellum* is a cellulosome-producing bacterium that couples rapid reproduction rates to highly efficient degradation of crystalline cellulose. Herein, we have developed and applied a suite of difluoromethylphenyl aglycone, N-halogenated glycosylamine, and 2-deoxy-2-fluoroglycoside activity-based protein profiling (ABPP) probes to the direct labeling of the *C. thermocellum* cellulosomal secretome. These activity-based probes (ABPs) were synthesized with alkynes to harness the utility and multimodal possibilities of click chemistry and to increase enzyme active site inclusion for liquid chromatography-mass spectrometry (LC-MS) analysis. We directly analyzed ABP-labeled and unlabeled global MS data, revealing ABP selectivity for glycoside hydrolase (GH) enzymes, in addition to a large collection of integral cellulosome-containing proteins. By identifying reactivity and selectivity profiles for each ABP, we demonstrate our ability to widely profile the functional cellulose-degrading machinery of the bacterium. Derivatization of the ABPs, including reactive groups, acetylation of the glycoside binding groups, and mono- and disaccharide binding groups, resulted in considerable variability in protein labeling. Our probe suite is applicable to aerobic and anaerobic microbial cellulose-degrading systems and facilitates a greater understanding of the organismal role associated with biofuel development.

To purchase a copy of this article, [Click Here](#)

Iron Dienylphosphate Tricarbonyl Complexes as Water-Soluble Enzyme-Triggered CO-Releasing Molecules (ET-CORMs)

Steffen Romanski, Hannelore Rücker, Eleni Stamellou, Miguel Guttentag, Jörg-Martin Neudörfl, Roger Alberto, Sabine Amslinger, Benito Yard, and Hans-Günther Schmalz

Organometallics 2012 31 (16), 5800-5809

Abstract: A series of racemic phosphoryloxy-substituted (η^4 -cyclohexadiene)Fe(CO)₃ complexes was synthesized by exploiting the O-phosphorylation of (dienol)Fe(CO)₃ intermediates generated in situ from the corresponding triisopropylsiloxyprotected complexes. The phosphorylated products were fully characterized by spectroscopic methods, including single-crystal X-ray diffraction in four cases. Monodeprotection of two dimethyl phosphate derivatives with trimethylamine led to the tetramethylammonium salts of the (cyclohexadienyl methyl phosphate)Fe(CO)₃ complexes. These compounds are the first water-soluble enzyme-triggered CO-releasing molecules (ET-CORMs). The phosphatase-induced CO release was monitored by means of GC. The biological activity was assessed in different cellular assays. The compounds were shown to be only slightly toxic, and a moderate anti-inflammatory potential was determined in an assay based on the inhibition of inducible NO synthase (iNOS)-induced NO production.

To purchase a copy of this article, [Click Here](#)

Robust phosphorescent platinum (II) complexes with tetradentate O $\wedge$ N $\wedge$ C $\wedge$ N $\wedge$ ligands: high efficiency OLEDs with excellent efficiency stability†

Steven C. F. Kui, Pui Keong Chow, Gang Cheng, Chi-Chung Kwok, Chun Lam Kwong, Kam-Hung Low and Chi-Ming Che*
Chem. Communications, 2013, 49, 1497-1499

Abstract: The Pt(II) complexes (1–3) bearing tetradentate O $\wedge$ N $\wedge$ C $\wedge$ N $\wedge$ ligands display high emission quantum yields (0.76–0.90) and good thermal stability ($T_d > 400$ °C). Complex 3 is an excellent green phosphorescence dopant for OLEDs with excellent efficiency and low efficiency roll-off (η_L , $\eta_{Ext(max)} = 66.7$ cd A⁻¹, 18.2%; η_L , η_{Ext} (1000 cd m⁻²) = 65.1 cd A⁻¹, 17.7%).

To purchase a copy of this article, [Click Here](#)

A Collection of Robust Methodologies for the Preparation of Asymmetric Hybrid Mn-Anderson Polyoxometalates for Multifunctional Materials

Carine Yvon, Andrew Macdonell, Saskia Buchwald, Andrew J. Surman, Noemie Follet, Jennifer Alex, De-Liang Long and Leroy Cronin

Chemical Science, 2013, Issue 10

Abstract: Here we report a suite of approaches for the isolation of asymmetrically grafted organic–inorganic hybrid Mn–Anderson polyoxometalate compounds (TBA)₃[MnMo₆O₁₈((OCH₂)₃CNHR₁)((OCH₂)₃CNHR₂)] (where TBA = tetrabutylammonium). Both a “pre-functionalization” route (for compound 1 – R₁ = –COC₁₄H₉, R₂ = –H) using two different TRIS-based ligands ((HOCH₂)₃CNHR), and a “post-functionalization” of the preformed TRIS Mn–Anderson compound (R₁ = R₂ = –H) were demonstrated. Compounds 2 (R₁ = –COC₁₅H₃₁, R₂ = –CO(CH₂)₂COOH) and 3 (R₁ = –COC₁₅H₃₁, R₂ = –H) are some of the first reported examples of asymmetric Mn–Anderson compounds to have been synthesized by the latter route. The reliable and broadly applicable chromatographic method used to isolate these compounds relies on the difference in affinity of compounds’ organic moieties for reverse phase (RP) media; the target asymmetric cluster will have an intermediate affinity, between that of the two symmetric by-products. For instances where this is not the case, we have prepared and isolated a “universal” asymmetric Mn–Anderson precursor 4 (R₁ = –C(O)OC₁₄H₁₁, R₂ = –H), which can be used as a precursor to synthesize practically any asymmetric Mn–Anderson system. The use of 4 as an “universal” precursor was successfully demonstrated in the synthesis and isolation of compound 5 (R₁ = –COC₂H₅, R₂ = –H), which would not be accessible by a simple ‘one pot’ approach. In addition to removing a significant barrier to the exploitation of asymmetric Mn–Anderson clusters as new functional materials, the methods presented here should be applicable to a range of other hybrid organic–inorganic clusters.

To purchase a copy of this article, [Click Here](#)

Carbohydrate Related Articles:



Rapid Labeling of Metabolically Engineered Cell-Surface Glycoconjugates with a Carbamate-Linked Cyclopropene Reporter

Anne-Katrin Späte, Holger Bußkamp, Andrea Niederwieser, Verena F. Schart, Andreas Marx, and Valentin Wittmann
Bioconjugate Chemistry 2014, 25, 147–154

Abstract: Metabolic oligosaccharide engineering is a valuable tool to monitor cellular carbohydrates. Here, we report the synthesis of a novel N-acyl-mannosamine derivative bearing a methylcyclopropene tag that is attached to the sugar via a carbamate moiety. This derivative undergoes rapid Diels–Alder reaction with inverse electron demand. We demonstrate that the cell’s biosynthetic machinery incorporates this non-natural mannosamine derivative into glycoconjugates that can, subsequently, be labeled within less than 10 min with a new sulfo-Cy3–tetrazine conjugate. Using this tetrazine–dye conjugate for the detection of the methylcyclopropene-tagged mannosamine derivative, we could achieve dual labeling of two different metabolically incorporated sugars combining a Diels–Alder reaction with inverse electron demand and a strain-promoted azide–alkyne cycloaddition which are carried out simultaneously in a single step.

To purchase a copy of this article, [Click Here](#)