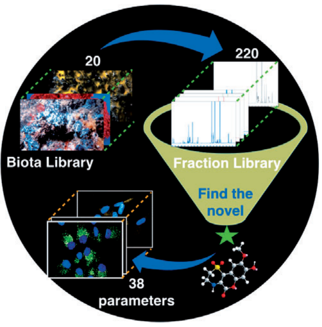
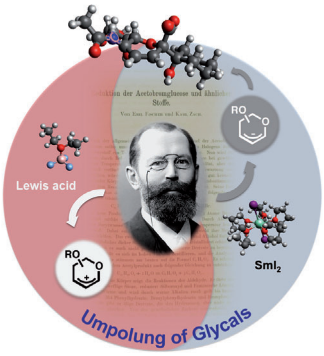
Pitch-dependent neurite outgrowth ...

… was demonstrated in primary hippocampal neurons on monolayers of silica beads. In their Communication on page 6075 ff., Y. Nam, J. S. Lee, I. S. Choi, and co-workers report that neurite outgrowth is accelerated on larger beads (white) compared to smaller beads (black) up to a bead diameter of approximately 1 μm. Biochemical analysis indicated that cytoskeletal actin dynamics are primarily responsible for the recognition of surface topography.

NMR Fingerprints

^{1}H NMR fingerprints are used to identify novel compounds including iotrochotazine A. This natural product has activity on a human Parkinson's disease cell model, as reported by R. J. Quinn and co-workers in their Communication on page 6070 ff.





Umpolung

In their Communication on page 6184 ff., G. Doisneau, J.-M. Beau et al. describe the chemoselective reductive coupling of carbonyl compounds with glycals that is induced by samarium diiodide.

Drug Delivery

R. Mo, C. Zhang et al. show in their Communication on page 6253 ff. how a pH-responsive nanogel is used to penetrate tumor cells, release a chemotherapeutic, and then, after release for the cell, infect further tumor cells.

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Author Profile

"I can never resist good food, good wine, and research funding.
My favorite foods are hot pot and soup …"
This and more about Vivian Wing-Wah Yam can be found on page 6034.

News


N. L. Abbott


M. Flytzani-Stephanopoulos


N. J. Halas


J. L. Hedrick


R. G. Bergman

Books

Correspondence

Chemical Bonding

G. Frenking* ______ **6040 – 6046**

Dative Bonds in Main-Group Compounds: A Case for More Arrows!

Semantics, definitions? The description of the electronic structure of main-group compounds with dative bonds significantly enriched the chemistry of sp block elements. The new viewpoint has proved to be a useful guideline for the synthesis of unusual donor–acceptor complexes and for explaining novel molecular structures. New compound classes such as carbones CL_2 and borylene complexes $(BH)L_2$ have been found.

Chemical Bonding

D. Himmel, I. Krossing,*
A. Schnepf ______ **6047 – 6048**

Dative or Not Dative?

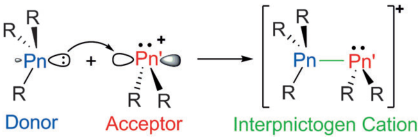
Is a meatball an animal praline? The authors of the Essay *Dative Bonds in Main-Group Compounds: A Case for Fewer Arrows!* respond to the criticism of Gernot Frenking and correct one point in their original Essay.

Reviews

Main-Group Chemistry

A. P. M. Robertson, P. A. Gray,
N. Burford* ______ **6050 – 6069**

Interpnictogen Cations: Exploring New Vistas in Coordination Chemistry



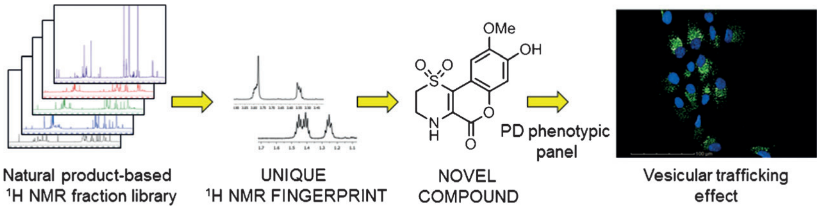
Coordinate or donor–acceptor bonding defines much of transition-metal chemistry, but is also prevalent between the nonmetals. This Review demonstrates the application of coordinate interactions between the pnictogen elements, revealing structural diversity and novelty. Compounds containing Pn—Pn or Pn′—Pn bonds involving cationic acceptors based on each of the pnictogen elements are discussed sequentially.

Communications

Natural Products

T. Grkovic, R. H. Pouwer, M.-L. Vial,
L. Gambini, A. Noël, J. N. A. Hooper,
S. A. Wood, G. D. Mellick,
R. J. Quinn* ______ **6070 – 6074**

NMR Fingerprints of the Drug-like Natural-Product Space Identify Iotrochotazine A: A Chemical Probe to Study Parkinson's Disease



Seeing the invisible: A novel natural product, iotrochotazine A was isolated using an NMR-based strategy focused on the analysis of ¹H NMR fingerprints of a prefractionated natural-product library. In a phenotypic assay panel based on hONS cells derived from idiopathic Parkinson's disease (PD) patients, it affected the morphology and cellular distribution of lysosomes and early endosomes.

Frontispiece

For the USA and Canada:
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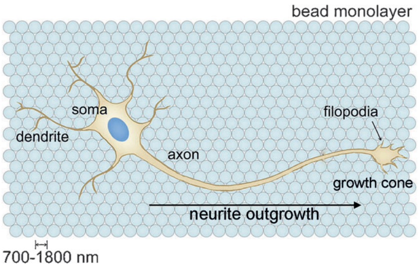
What a nerve: The initial neurite development of hippocampal neurons was studied on assembled silica beads with diameters ranging from 700 to 1800 nm. Neurite outgrowth accelerated with increasing bead size up to a bead diameter of approximately 1000 nm, above which saturation was observed. Biochemical analysis indicated that cytoskeletal actin dynamics were primarily responsible for the recognition of surface topography.



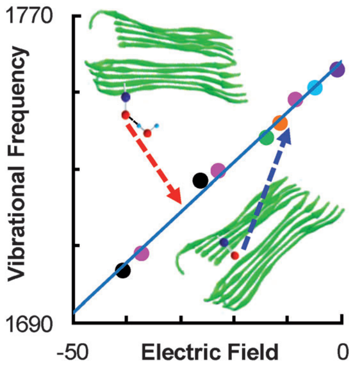
Neurochemistry

K. Kang, S. Y. Yoon, S.-E. Choi, M.-H. Kim, M. Park, Y. Nam,* J. S. Lee,* I. S. Choi* ______ **6075 – 6079**

Cytoskeletal Actin Dynamics are Involved in Pitch-Dependent Neurite Outgrowth on Bead Monolayers

Front Cover

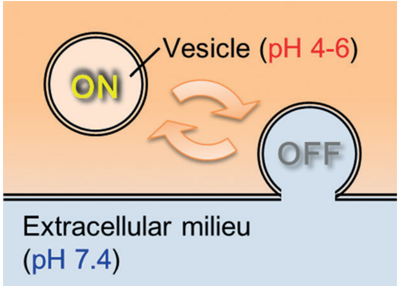
A telling relationship: Electrostatic interactions between proteins and other molecules often play a key role in mediating biological processes. However, quantification of the underlying electrostatic forces requires knowledge of the local electrostatic environment. The C=O stretching frequency of an ester moiety on two non-natural amino acids was found to be a good probe of the local electrostatic field and dielectric constant (see graph).



Protein Electrostatics

I. M. Pazos, A. Ghosh, M. J. Tucker,* F. Gai* ______ **6080 – 6084**

Ester Carbonyl Vibration as a Sensitive Probe of Protein Local Electric Field

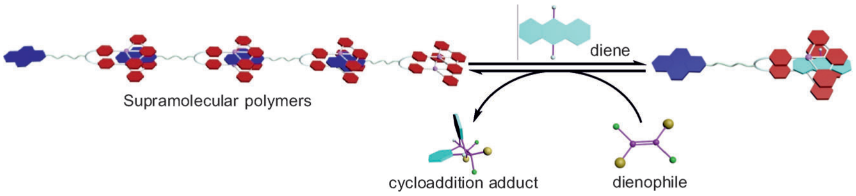


Going live: Live imaging of the dynamics of exocytosis is crucial for a precise spatiotemporal understanding of secretion phenomena. Small-molecular fluorescent probes designed to be activated under acidic intravesicular conditions enabled the sensitive and reliable visualization of vesicular dynamics with high spatiotemporal precision (see picture).

Vesicular Imaging

D. Asanuma, Y. Takaoka, S. Namiki, K. Takikawa, M. Kamiya, T. Nagano, Y. Urano,* K. Hirose* ______ **6085 – 6089**

Acidic-pH-Activatable Fluorescence Probes for Visualizing Exocytosis Dynamics



Trigger happy: Supramolecular polymers are constructed based on the novel bis[alkynylplatinum(II)] terpyridine molecular tweezer/pyrene recognition motif. Successive addition of anthracene as the diene and a cyano-functionalized dienophile triggers the reversible supramolecular polymerization process, thus advancing the concept of utilizing Diels–Alder chemistry to access stimuli-responsive materials in compartmentalized systems.

Molecular Recognition

T.-K. Tian, Y.-G. Shi, Z.-S. Yang, F. Wang* ______ **6090 – 6094**

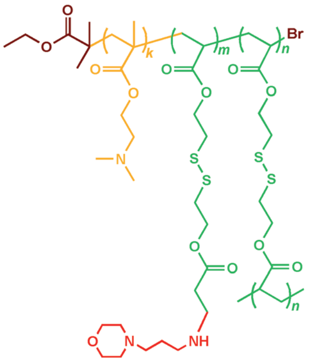
Responsive Supramolecular Polymers Based on the Bis[alkynylplatinum(II)] Terpyridine Molecular Tweezer/Arene Recognition Motif

Gene Delivery

T. Zhao, H. Zhang, B. Newland, A. Aied, D. Zhou, W. Wang* ______ **6095 – 6100**

Significance of Branching for Transfection: Synthesis of Highly Branched Degradable Functional Poly(dimethylaminoethyl methacrylate) by Vinyl Oligomer Combination

Branching out into new territory: Highly branched poly(dimethylaminoethyl methacrylate) (PDMAEMA) copolymers (see structure) with a controlled degree of branching and the ability to undergo efficient degradation were investigated as gene-delivery vectors. Their transfection profile in terms of both transfection capability and the preservation of cell viability was superior to that of linear PDMAEMA.

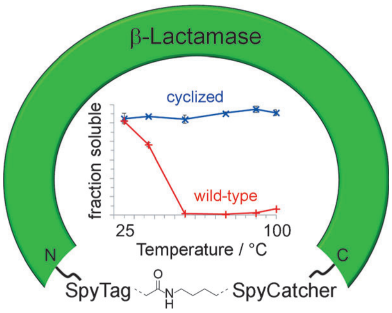


Protein Engineering

C. Schoene, J. O. Fierer, S. P. Bennett, M. Howarth* ______ **6101 – 6104**

SpyTag/SpyCatcher Cyclization Confers Resilience to Boiling on a Mesophilic Enzyme

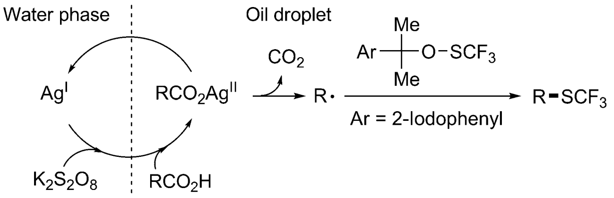
Spy ring: The enzymes β-lactamase and dihydrofolate reductase were cyclized through an N-terminal SpyTag peptide and a C-terminal SpyCatcher protein, which spontaneously react to form an amide bond. The cyclized enzymes display substantially increased resilience, remaining soluble and active following boiling at 100 °C. This strategy is an easy way to cyclize proteins and can lead to major enhancement of the robustness of biological catalysts.



Trifluoromethylthiolation

F. Hu, X. Shao, D.-H. Zhu, L. Lu, Q. Shen* ______ **6105 – 6109**

Silver-Catalyzed Decarboxylative Trifluoromethylthiolation of Aliphatic Carboxylic Acids in Aqueous Emulsion



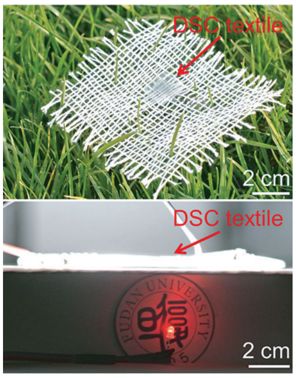
Oil-in-water: Secondary and tertiary carboxylic acids were successfully transformed to their trifluoromethylthiolated derivatives using the title reaction, which tolerates a wide range of functional groups. The reaction was dramatically accelerated by the use of an aqueous emulsion as the reaction medium, which was formed by the addition of sodium dodecyl sulfate (SDS) in water.

Dye-Sensitized Solar Cells

S. Pan, Z. Yang, P. Chen, J. Deng, H. Li, H. Peng* ______ **6110 – 6114**

Wearable Solar Cells by Stacking Textile Electrodes

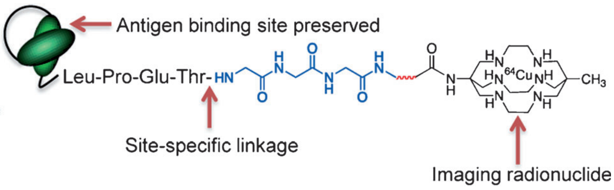
Wearable and efficient dye-sensitized solar cells (DSC) that are based on textile electrodes were synthesized according to a new and general method. These DSC textiles are flexible and stable and can be easily integrated to tune the output voltage or current. The use of these wearable DSC textiles to drive a light-emitting diode was successfully demonstrated.



Site-Specific Bioconjugation

B. M. Paterson, K. Alt, C. M. Jeffery, R. I. Price, S. Jagdale, S. Rigby, C. C. Williams, K. Peter, C. E. Hagemeyer,* P. S. Donnelly* ________ **6115 – 6119**

Enzyme-Mediated Site-Specific Bioconjugation of Metal Complexes to Proteins: Sortase-Mediated Coupling of Copper-64 to a Single-Chain Antibody

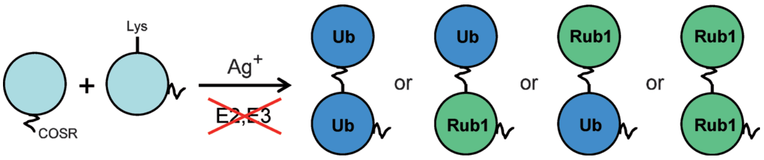


Enzyme-mediated bioconjugation with sortase A resulted in the site-specific and controlled attachment of a macrocyclic metal-binding amine ligand to a single-chain antibody against the platelet integrin GPIIb/IIIa in its active ligand-bound form. The new conjugate was radiolabeled with copper-64 and proved to be a promising imaging agent for positron emission tomography.

Protein Modification

R. K. Singh, A. Sundar, D. Fushman* ________ **6120 – 6125**

Nonenzymatic Rubylation and Ubiquitination of Proteins for Structural and Functional Studies

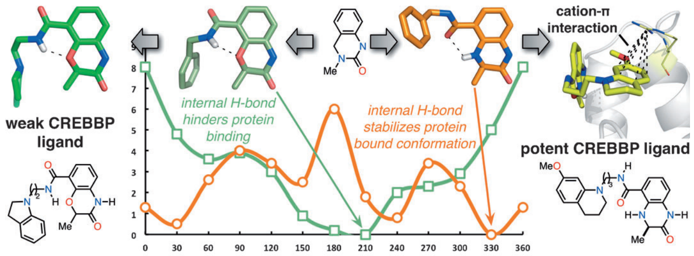


Aye, there's the Rub: Studying the structure and function of diverse polymeric chains of ubiquitin (Ub) or Ub-like proteins such as Rub1 is a significant challenge owing to a lack of conjugating E2 enzymes. A method was developed for the rubylation of Ub and Rub1 and the ubiquitination of Rub1 with no need for E2 and E3 enzymes. This made it possible to investigate the structure, recognition, and processing of these chains.

Ligand Discovery

T. P. C. Rooney, P. Filippakopoulos, O. Fedorov, S. Picaud, W. A. Cortopassi, D. A. Hay, S. Martin, A. Tumber, C. M. Rogers, M. Philpott, M. Wang, A. L. Thompson, T. D. Heightman, D. C. Pryde, A. Cook, R. S. Paton, S. Müller, S. Knapp, P. E. Brennan, S. J. Conway* ________ **6126 – 6130**

A Series of Potent CREBBP Bromodomain Ligands Reveals an Induced-Fit Pocket Stabilized by a Cation–π Interaction

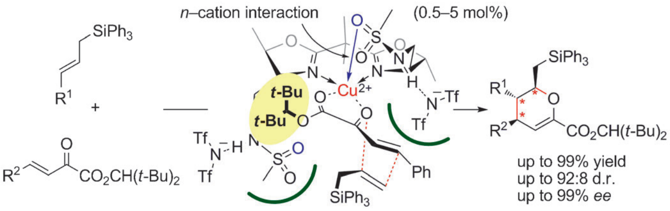


Ligands made to fit: A series of dihydroquinoxalinone fragments were employed as acetyl lysine mimics in the development of CREBBP bromodomain ligands. The side chain of these ligands binds in an induced-fit pocket and forms a cation–π interaction with R1173 of CREBBP. The most potent compound inhibits binding of CREBBP to chromatin in U2OS cells.

Asymmetric Catalysis

Y. Matsumura, T. Suzuki, A. Sakakura,* K. Ishihara* ________ **6131 – 6134**

Catalytic Enantioselective Inverse Electron Demand Hetero-Diels–Alder Reaction with Allylsilanes



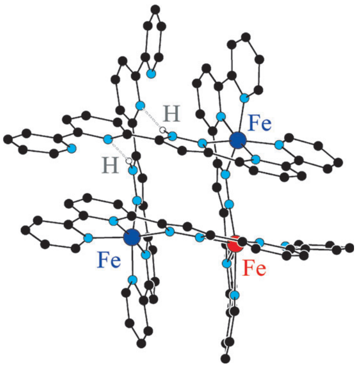
New on the block: The first diastereo- and enantioselective title reaction of β,γ-unsaturated α-ketoesters with allylsilanes is described. Chiral copper(II) catalysts successfully activate the β,γ-unsaturated α-ketoesters and promote the reaction with allylsilanes with excellent enantioselectivities. This process represents a new entry to chiral oxanes, which are useful building blocks. Tf = trifluoromethanesulfonyl.

Spin Switching

M. Steinert, B. Schneider, S. Dechert,
S. Demeshko, F. Meyer* ___ **6135 – 6139**

A Trinuclear Defect-Grid Iron(II) Spin Crossover Complex with a Large Hysteresis Loop that is Readily Silenced by Solvent Vapor

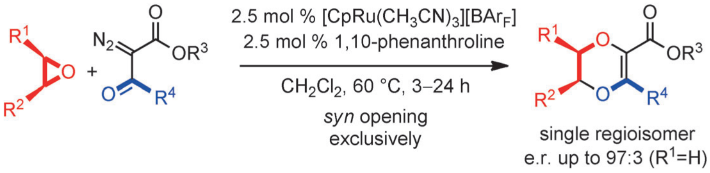
The effect of a defect: A new type of [2×2] matrix-like complexes with one vertex devoid of a metal ion, namely a "defect-grid" triiron(II) complex, exhibits a sharp and complete spin-crossover (SCO) with wide hysteresis near room temperature. The H-bonded vertex results in the stabilization of spin states but also mediates a dramatic, yet reversible, response to the uptake of exogenous solvent molecules leading to silencing of the SCO.



Synthetic Methods

T. Achard, C. Tortoreto,
A. I. Poblador-Bahamonde, L. Guénée,
T. Bürgi, J. Lacour* ________ **6140 – 6144**

[CpRu]-Catalyzed Carbene Insertions into Epoxides: 1,4-Dioxene Synthesis through S_N1-Like Chemistry with Retention of Configuration



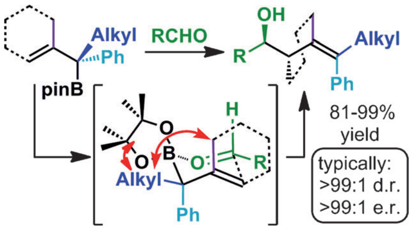
Oxygen sticks around: Rather than lead to the usual deoxygenation pathway, metal carbenes derived from α-diazo-β-ketoesters undergo three-atom insertions into epoxides using a combination of 1,10-phenanthroline and $[CpRu(CH_3CN)_3][BAr_F]$. 1,4-Dioxene motifs are obtained as single regio- and stereoisomers with perfect *syn* stereochemistry. BAr_F = tetrakis[3,5-bis(trifluoromethyl)phenyl]borate, Cp = cyclopentadienyl.

Allylboration

M. J. Hesse, S. Essafi, C. G. Watson,
J. N. Harvey, D. Hirst, C. L. Willis,
V. K. Aggarwal* ____________ **6145 – 6149**

Highly Selective Allylborations of Aldehydes Using α,α-Disubstituted Allylic Pinacol Boronic Esters

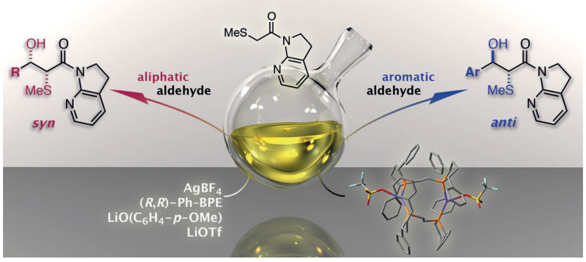
Asymmetric C–C coupling: α,α-Disubstituted allylic pinacol boronic esters undergo highly selective allylborations of aldehydes to give tetrasubstituted homoallylic alcohols with exceptional levels of *anti-Z*-selectivity (see scheme). The scope of the reaction includes both acyclic and cyclic allylic boronic esters. β-Borylated allylic boronic esters gave fully substituted vinyl boronates suitable for further cross-coupling.



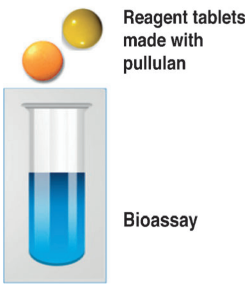
Asymmetric Catalysis

K. Weidner, N. Kumagai,*
M. Shibasaki* ____________ **6150 – 6154**

A Designed Amide as an Aldol Donor in the Direct Catalytic Asymmetric Aldol Reaction



In play: Direct catalytic asymmetric aldol reactions offer efficient access to β-hydroxy carbonyl entities. Described is the robust title reaction of α-sulfanyl 7-azaindolinylamide, which affords both aromatic and aliphatic β-hydroxy amides with high *ee* values. The transformation features the cooperative interplay of a soft and a hard Lewis acid.



Locked and loaded: Pullulan encapsulation enables the room-temperature shipping and long-term storage of unstable biomolecules (such as enzymes and their substrates). The pullulan tablets dissolve quickly in aqueous solution to release defined premeasured amounts of the reagent. The reagent stabilization and ease of use afforded by this method would be particularly advantageous for bioassays intended for use in resource-limited settings.

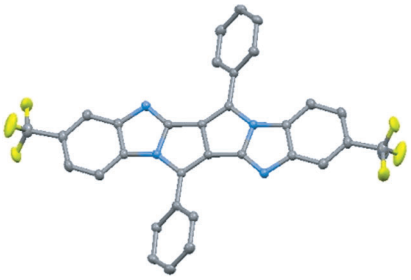
Bioassays

S. Jahanshahi-Anbuhi, K. Pennings, V. Leung, M. Liu, C. Carrasquilla, B. Kannan, Y. Li, R. Pelton, J. D. Brennan,* C. D. M. Filipe* __________ **6155 – 6158**

Pullulan Encapsulation of Labile Biomolecules to Give Stable Bioassay Tablets

---

Making acene: A family of novel, persistent 6-5-5-5-5-6 fused ring systems, which in their fully conjugated state closely resemble azahexacene aromatic systems, were synthesized starting from their respective diketopyrrolopyrroles (see structure; C black, N blue, F green). The optical and electronic properties of these new molecular scaffolds suggest that they have potential as alternatives to the traditionally utilized acenes for materials application.



Polycyclic Aromatic Hydrocarbons

W. Yue, S.-L. Suraru, D. Bialas, M. Müller, F. Würthner* __________ **6159 – 6162**

Synthesis and Properties of a New Class of Fully Conjugated Azahexacene Analogues

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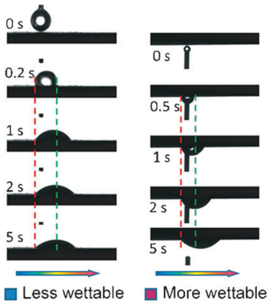

No two ways about it: Directional spreading was made possible on a high-adhesion surface by simply controlling anodic oxidation. When a droplet came into contact with the substrate, it immediately spread along the direction of the wettability gradient, even when the surface was turned upside down (see picture). V- and inverse-V-shaped wettability gradients, on which two droplets spread either toward or away from one another, were also formed.

Smart Materials

S. Feng, S. Wang, L. Gao, G. Li, Y. Hou,* Y. Zheng* __________ **6163 – 6167**

Controlled Directional Water-Droplet Spreading on a High-Adhesion Surface

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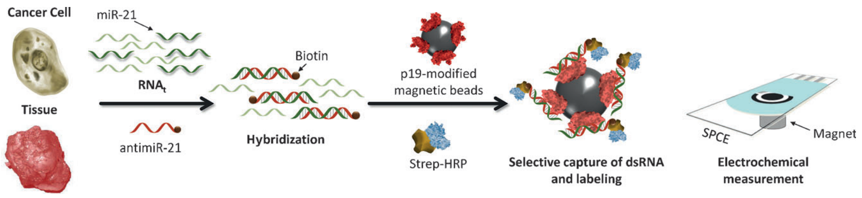


A throw-away idea: An amperometric magnetosensor based on a specific RNA probe (red strands) and protein p19 as biorecognition elements was developed as a disposable diagnostic tool for the determination of miR-21 (green strands) in cancer cells and tissues. Labeling of the biotinylated RNA hybrid with streptavidin conjugated to horseradish peroxidase (Strep–HRP) enabled electrochemical detection on a screen-printed carbon electrode (SPCE).

Cancer MicroRNAs

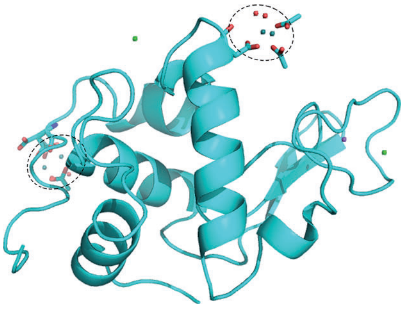
S. Campuzano,* R. M. Torrente-Rodríguez, E. López-Hernández, F. Conzuelo, R. Granados, J. M. Sánchez-Puelles, J. M. Pingarrón* __________ **6168 – 6171**

Magnetobiosensors Based on Viral Protein p19 for MicroRNA Determination in Cancer Cells and Tissues

Metal–Protein Interactions

Unusual Structural Features in the Lysozyme Derivative of the Tetrakis(acetato)chloridodiruthenium(II,III) Complex

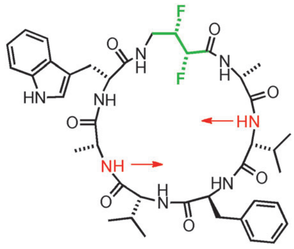
Paddling through: The adduct formed between the paddle-wheel tetrakis(acetato)chloridodiruthenium(II,III) complex and hen egg-white lysozyme (turquoise ribbon structure) was characterized through ESI mass spectrometry and X-ray crystallography. Unusual and interesting features were revealed in the binding mode of the diruthenium centers (circled) to the protein side chains.



Shape Shifting

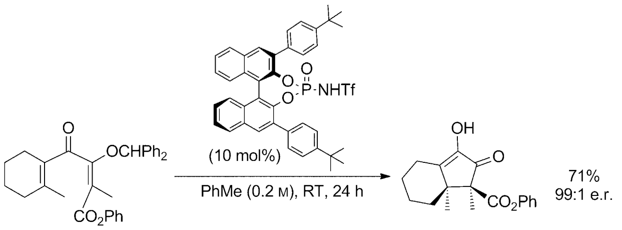
Stereoselective Fluorination Alters the Geometry of a Cyclic Peptide: Exploration of Backbone-Fluorinated Analogues of Unguisin A

What an impact! Stereoselective fluorination is developed as a new strategy for fine-tuning the shapes of cyclic peptides. Four vicinal difluorinated analogues of a natural cyclic heptapeptide were efficiently synthesized. The analogues (one is shown on the right) adopt dramatically different geometries compared to the natural product.



Vicinal Quaternary Stereocenters

Catalytic Enantioselective Nazarov Cyclization: Construction of Vicinal All-Carbon-Atom Quaternary Stereocenters

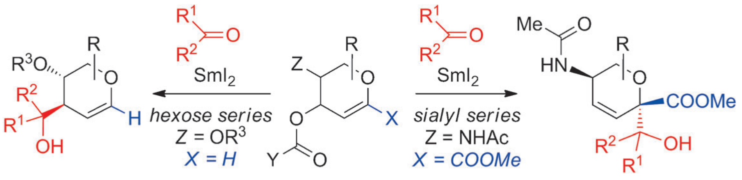


Nazarov cyclization: The diastereoselective asymmetric synthesis of vicinal all-carbon-atom quaternary stereocenters is a challenging problem in organic synthesis. A catalytic asymmetric Nazarov cyclization of fully substituted dienones now provides cyclopentenone derivatives with vicinal quaternary stereocenters in high optical purity and as single diastereoisomers.

Umpolung

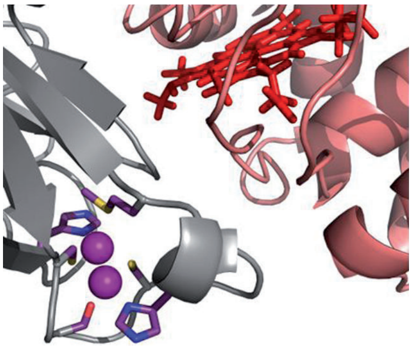
Direct Umpolung of Glycals and Related 2,3-Unsaturated *N*-Acetylneuraminic Acid Derivatives Using Samarium Diiodide

Inside Back Cover



Samarium can do it alone: Without the help of transition metals, samarium(II) iodide induces a chemoselective reductive coupling of carbonyl compounds with glycals. The high regioselectivity and stereoselectivity of the transformation are controlled by the structure of the substrates.

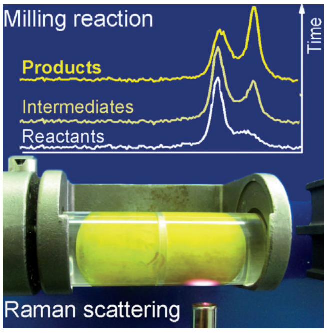
The electronic structure of the Cu_A center can be tuned by second-shell perturbations. An equilibrium between two alternative ground states of σ_u* and π_u symmetry can be perturbed without altering the identity of the metal ligands, so that the redox potential of the metal site is preserved while alternative electron-transfer pathways become possible.



Electron Transfer in Proteins

M. N. Morgada, L. A. Abriata, U. Zitare, D. Alvarez-Paggi, D. H. Murgida, A. J. Vila* **6188–6192**

Control of the Electronic Ground State on an Electron-Transfer Copper Site by Second-Sphere Perturbations

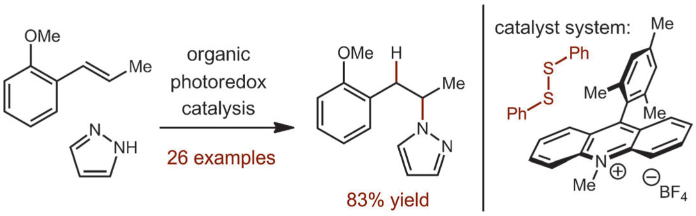


Out of the dark: Mechanochemical reaction mechanisms were studied by a laboratory Raman spectroscopy technique developed for in situ and real-time monitoring of milling reactions (see picture). The technique enabled the course of mechanochemical transformations of coordination polymers and organic materials to be followed as well as the study of liquid additives.

Mechanisms of Mechanochemistry

D. Gracin, V. Štrukil, T. Friščić, I. Halasz,* K. Užarević* **6193–6197**

Laboratory Real-Time and In Situ Monitoring of Mechanochemical Milling Reactions by Raman Spectroscopy

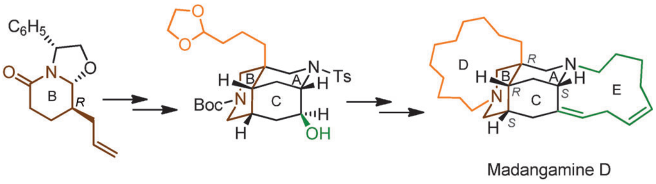


On the (*anti*)mark: Disclosed is a general catalytic system for the intermolecular *anti*-Markovnikov hydroamination of alkenes. An organocatalytic photoredox system tolerates α- and β-substituted styrenes, as well as aliphatic alkenes. Heterocyclic amines were also successfully employed as nitrogen nucleophiles, thus providing a direct route to heterocyclic motifs common in medicinal agents.

Photochemistry

T. M. Nguyen, N. Manohar, D. A. Nicewicz* **6198–6201**

anti-Markovnikov Hydroamination of Alkenes Catalyzed by a Two-Component Organic Photoredox System: Direct Access to Phenethylamine Derivatives



Mad about madangamines: The first total synthesis of an alkaloid of the madangamine group has been accomplished. Using a phenylglycinol-derived lactam as the starting enantiomeric scaffold, the synthesis of (+)-madangamine D involves the successive construction of the six-membered carbocyclic C and heterocyclic A rings to generate the functionalized diazatricyclic ABC intermediates and the subsequent assembly of the peripheral macrocyclic D and E rings. Ts = 4-toluenesulfonyl.

Natural Product Synthesis

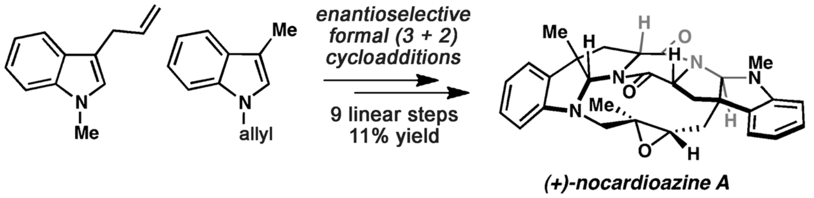
R. Ballette, M. Pérez, S. Proto, M. Amat,* J. Bosch **6202–6205**

Total Synthesis of (+)-Madangamine D

Natural Products

H. Wang, S. E. Reisman* ___ **6206 – 6210**

Enantioselective Total Synthesis of (−)-Lansai B and (+)-Nocardioazines A and B

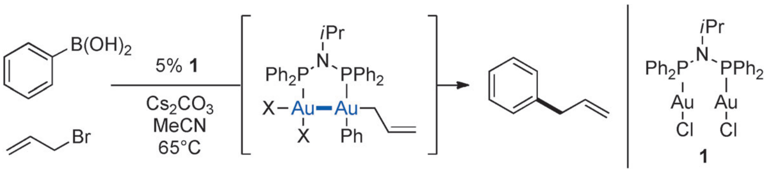


No-cardio required: The concise total syntheses of the bis(pyrroloindolines) (−)-lansai B and (+)-nocardioazines A and B are reported. The key pyrroloindoline building blocks are rapidly prepared by enantioselective formal (3+2) cycloaddition reactions. The macrocycle of (+)-nocardioazine A is constructed by an unusual intramolecular diketopiperazine formation.

Gold-Catalyzed Cross-Coupling

M. D. Levin, F. D. Toste* ___ **6211 – 6215**

Gold-Catalyzed Allylation of Aryl Boronic Acids: Accessing Cross-Coupling Reactivity with Gold

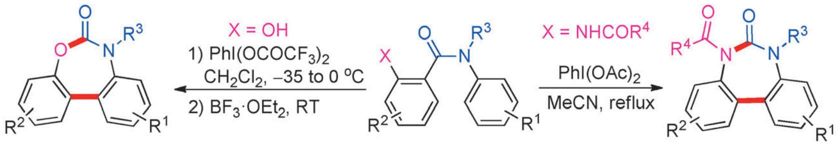


Teaching Au new tricks: A novel manifold for reactivity in gold catalysis has been realized, allowing the cross-coupling of arylboronic acids and allylic bromides without a sacrificial oxidant. A bimetallic catalyst is employed, providing allylbenzene products with unique scope and chemoselectivity. A mechanistic proposal is put forward based on stoichiometric experiments, including the isolation of an Au^{III} allyl complex.

Heterocycle Synthesis

S. Shang, D. Zhang-Negrerie, Y. Du,*
K. Zhao* ___ **6216 – 6219**

Intramolecular Metal-Free Oxidative Aryl–Aryl Coupling: An Unusual Hypervalent-Iodine-Mediated Rearrangement of 2-Substituted *N*-Phenylbenzamides

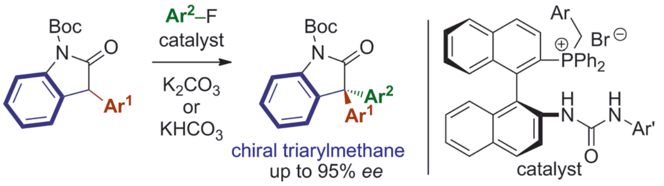


Making (re)arrangements: Hypervalent-iodine-mediated oxidative coupling of the two aryl groups in either 2-acylamino-*N*-phenyl-benzamides or 2-hydroxy-*N*-phenylbenzamides with concomitant insertion of the *ortho*-substituted N or O atom into the tether is described. This unusual metal-free rearrangement reaction involves an oxidative $C(sp^2)$–$C(sp^2)$ aryl–aryl bond formation, cleavage of a $C(sp^2)$–C(O) bond, and a lactamization/lactonization.

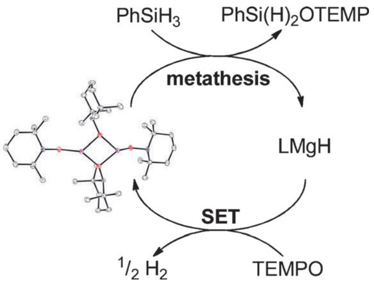
Asymmetric Catalysis

S. Shirakawa, K. Koga, T. Tokuda,
K. Yamamoto, K. Maruoka* . **6220 – 6223**

Catalytic Asymmetric Synthesis of 3,3′-Diaryloxindoles as Triarylmethanes with a Chiral All-Carbon Quaternary Center: Phase-Transfer-Catalyzed S_NAr Reaction



Going through a phase: Catalytic asymmetric synthesis of unsymmetrical triarylmethanes, with a chiral all-carbon quaternary center, was achieved by using a chiral bifunctional quaternary phosphonium bromide catalyst in the S_NAr reaction of 3-aryloxindoles. The reactions proceeded under phase-transfer conditions. Boc = *tert*-butoxycarbonyl.

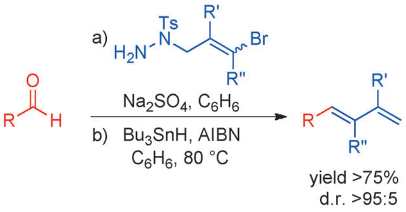


Upping the tempo: Reactions of TEMPO (2,2,6,6-tetramethyl-1-piperidinyloxy) with magnesium hydride species initiate catalytic hydrogen release through sequential TEMPO-mediated redox and Mg–O/Si–H metathesis processes (see scheme). This is the first example of catalytic single-electron transfer reactivity involving an s-block metal.

σ-Bond Metathesis

D. J. Liptrot, P. M. S. Hill,*
M. F. Mahon ———— **6224 – 6227**

Accessing the Single-Electron Manifold: Magnesium-mediated Hydrogen Release from Silanes

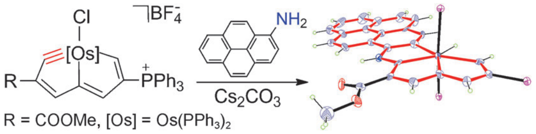


Make it to break it: The highly efficient and diastereoselective synthesis of *E* dienes has been accomplished through radical cyclization of bromoallyl hydrazones. This methodology proceeds through a one-pot condensation/radical cyclization/cycloreversion cascade from simple aldehyde starting materials in high yields and diastereoselectivities (see scheme; AIBN = azobis(isobutyronitrile), Ts = 4-toluenesulfonyl).

Synthetic Methods

N. E. Campbell,
G. M. Sammis* ———— **6228 – 6231**

Single-Electron/Pericyclic Cascade for the Synthesis of Dienes

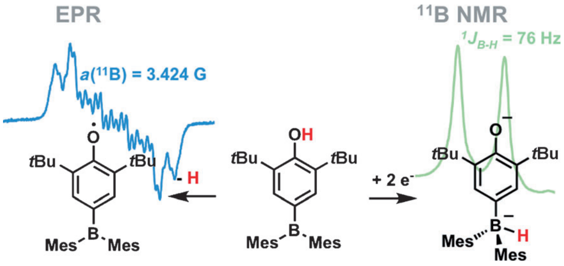


Poly put the metal on: A general route is developed to synthesize metal-bridged polycyclic aromatic complexes, in which the metal center is shared by three aromatic fused five-membered rings. This synthetic method opens a new way to prepare large, metal-bridged polycyclic aromatic complexes.

Polycyclic Aromatics

C. Zhu, Q. Zhu, J. Fan, J. Zhu, X. He,
X.-Y. Cao,* H. Xia* ———— **6232 – 6236**

A Metal-Bridged Tricyclic Aromatic System: Synthesis of Osmium Polycyclic Aromatic Complexes



A radical approach: Chemical reduction of a hydroxyphenyl-substituted borane triggers a sequential electron- and hydrogen-atom-transfer process to afford a hydridoborate phenoxide dianion. Hydrogen-atom abstraction of the borane allows isolation of a neutral borylated phenoxyl radical, which can be transformed to a benzoquinone borataalkene by reduction with cobaltocene.

Borane Reduction

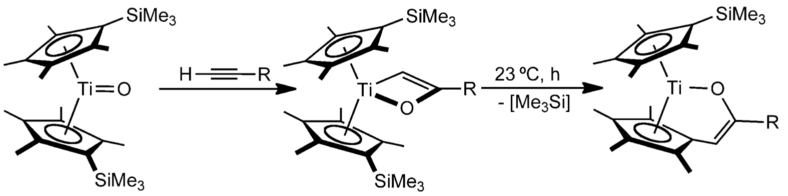
P.-Y. Feng, Y.-H. Liu, T.-S. Lin, S.-M. Peng,
C.-W. Chiu* ———— **6237 – 6240**

Redox Chemistry of a Hydroxyphenyl-Substituted Borane

Cyclopentadienyl Modification

I. Pappas, P. J. Chirik* ______ 6241 – 6244

Alkyne Cycloaddition to a Titanocene Oxide as a Route to Cyclopentadienyl Modification

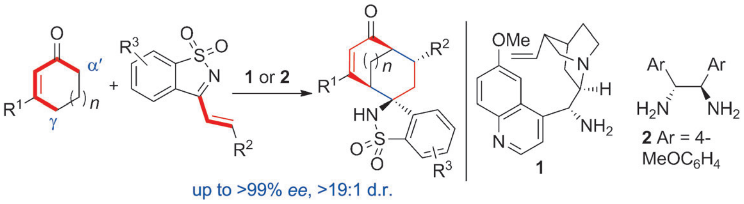


A scenic route: Cycloaddition of terminal and internal alkynes with a base-free titanocene oxide generates kinetically unstable oxatitanacyclobutene complexes that undergo C–C reductive elimination with the cyclopentadienyl ring. Subsequent ejection of a SiMe$_3$ group results in a unique sequence for cyclopentadienyl modification.

Organocatalysis

X. Yin, Y. Zheng, X. Feng, K. Jiang,
X.-Z. Wei, N. Gao,*
Y.-C. Chen* ______ 6245 – 6248

Asymmetric [5+3] Formal Cycloadditions with Cyclic Enones through Cascade Dienamine–Dienamine Catalysis

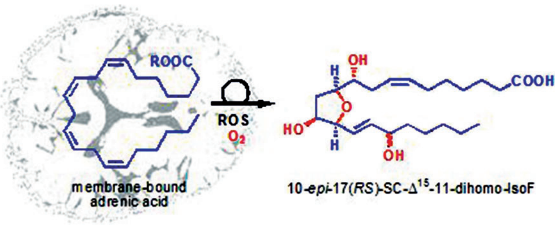


A fusion work: The title reaction is described for β-substituted 2-cyclopentenones or 2-cyclohexenone and bis(electrophilic) 3-vinyl-1,2-benzoisothiazole-1,1-dioxides. The α′-regioselective Michael addition and subsequent γ-regioselective Mannich reaction leads to fused or bridged frameworks with excellent stereoselectivity. Some of the chiral products exhibited promising anticancer activity.

Total Synthesis

A. de La Torre, Y. Y. Lee, C. Oger,
P. T. Sangild, T. Durand, J. C. Y. Lee,*
J.-M. Galano* ______ 6249 – 6252

Synthesis, Discovery, and Quantitation of Dihomo-Isofurans: Biomarkers for In Vivo Adrenic Acid Peroxidation



White matter matters: The enantioselective synthesis of dihomo-Isofurans (dihomo-IsoFs), metabolites from in vivo peroxidation of adrenic acid (found in white matter of the brain), is described and employs a C_2-symmetric precursor in a divergent strategy. Mass-spectrometry analysis accurately validated its presence in pig brain, and quantitation analysis showed, for the first time, the importance of such a novel biomarker in assessing lipid peroxidation.

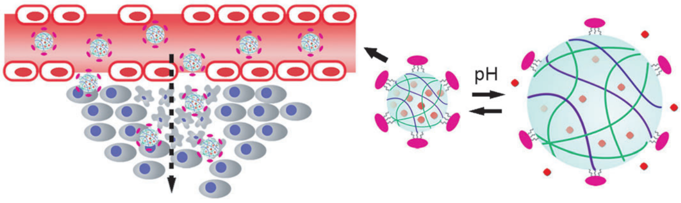
Drug Delivery

VIP

C. Ju, R. Mo,* J. Xue, L. Zhang, Z. Zhao,
L. Xue, Q. Ping, C. Zhang* _ 6253 – 6258

Sequential Intra-Intercellular Nanoparticle Delivery System for Deep Tumor Penetration

Back Cover

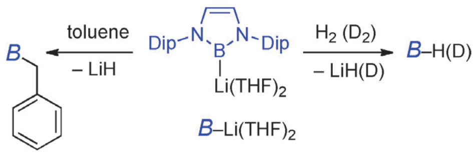


Special delivery: A nanoparticle delivery system consisting of a reversible swelling–shrinking nanogel allows deep tumor penetration of chemotherapeutics. It shows efficient drug release and intracellular trafficking to kill cancer cells, and after being released from the dead cells, can continue infecting neighboring cancer cells closer to the center of the tumor.

Super Bases

N. Dettenrieder, Y. Aramaki, B. M. Wolf,
C. Maichle-Mössmer, X. Zhao,
M. Yamashita,* K. Nozaki,*
R. Anwander* **6259 – 6262**

Assessing the Brønsted Basicity of Diaminoboryl Anions: Reactivity toward Methylated Benzenes and Dihydrogen

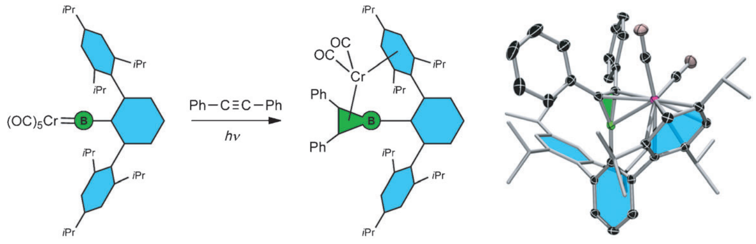


Back to basics: The deprotonation reactions of methylated benzenes and H_2 by superbasic boryl anions were studied. In the reaction of methylated benzenes, subsequent nucleophilic substitution on the boron center of intermediate *B*–H produces benzylborane species (structure of the *B* unit shown in the scheme; Dip = 2,6-*i*$Pr_2C_6H_3$). A general mechanism for these reactions is elaborated and the reactivity of *B*-Li(THF)$_2$ toward H_2 investigated by DFT calculations.

Borirene Ligands

H. Braunschweig,* R. D. Dewhurst,
K. Radacki, C. W. Tate,
A. Vargas **6263 – 6266**

Trihapto Ligation of a Borirene to a Single Metal Atom: A Heterocyclic Analogue of the η³-Cyclopropenyl Ligand

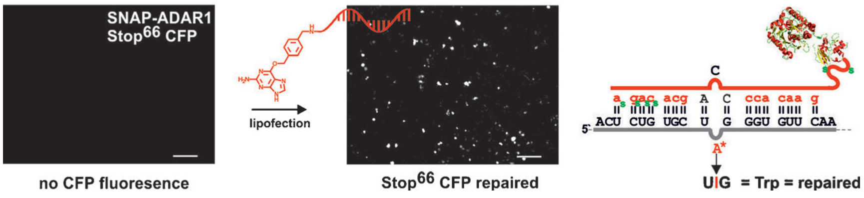


A borirene provides the *ansa*: The photolytic transfer of an arylborylene fragment from a bulky arylborylene complex to diphenylacetylene and loss of three CO ligands from the precursor resulted in the first complex containing an η³-coordinated borirene ligand bound to a single metal atom (see scheme). Like its more electron-rich and π-stabilized amino/organometallic counterparts, an aryl-substituted borylene ligand can be transferred from a transition-metal borylene.

RNA Repair

P. Vogel, M. F. Schneider, J. Wettengel,
T. Stafforst* **6267 – 6271**

Improving Site-Directed RNA Editing In Vitro and in Cell Culture by Chemical Modification of the GuideRNA



Adenosine-to-inosine editing can be re-addressed to arbitrary mRNAs by applying antagomir-like guideRNAs. Extensive chemical modification of the guideRNA clearly improves performance of the covalent conjugates between guideRNA and SNAP-ADAR inside the cell. Furthermore, modification allows control over editing selectivity and is exploited for the challenging repair of the Factor 5 Leiden missense mutation.

Forensic Science

A. van Dam, J. C. V. Schwarz, J. de Vos,
M. Siebes, T. Sijen, T. G. van Leeuwen,
M. C. G. Aalders,
S. A. G. Lambrechts* ______ 6272 – 6275

Oxidation Monitoring by Fluorescence Spectroscopy Reveals the Age of Fingermarks

Inside Cover

Marking time: Currently no method exists that can estimate the age of a fingermark. Information on the time passed since fingermark deposition is of forensic value as it may link the fingermark donor not only to the crime scene but also to the assumed time of crime. Based on the oxidation of proteins present in fingermarks and the corresponding change in fluorescence, the age of a subset of fingermarks could be estimated up to three weeks after deposition with an uncertainty of 1.9 days.

Supporting information is available on www.angewandte.org (see article for access details).

A video clip is available as Supporting Information on www.angewandte.org (see article for access details).

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The Very Important Papers, marked VIP, have been rated unanimously as very important by the referees.

The Hot Papers are articles that the Editors have chosen on the basis of the referee reports to be of particular importance for an intensely studied area of research.

Angewandte Corrigendum

Structural Characterization of α/β-Peptides having Alternating Residues: X-ray Structures of the 11/9-Helix from Crystals of Racemic Mixtures

M. Lee, J. Shim, P. Kang, I. A. Guzei,
S. H. Choi* __________ 12564–12567

Angew. Chem. Int. Ed. **2013**, *52*

DOI: 10.1002/anie.201306404

The authors of this Communication noticed that some information in references is incorrect. The correct CCDC number for *rac*-**4** in reference [16] is 946118, and the correct reference [13] is shown below.

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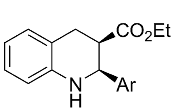
[13] D. J. Barlow, J. M. Thorton, *J. Mol. Biol.* **1988**, *201*, 601 – 619.

Angewandte Corrigendum

The relative configuration of **4ac**–**4ah** in Table 2 (entries 8–13) of this Communication was incorrectly assigned by referring to single-crystal X-ray analysis of **4fa**. The correct structures, according to an X-ray analysis after derivatization of **4ac**, are shown below. The correct names of **4ac**–**4ah** are shown in the revised Supporting Information published along with this Corrigendum.

This correction does not change any conclusion of this Communication. The authors thank Professor Yong-Gui Zhou at Dalian Institute of Chemical Physics, Chinese Academy of Sciences, for drawing their attention to this issue.



4ac, Ar = Ph
4ad, Ar = 4-MeC$_6$H$_4$
4ae, Ar = 4-FC$_6$H$_4$
4af, Ar = 4-ClC$_6$H$_4$
4ag, Ar = 4-NO$_2$C$_6$H$_4$
4ah, Ar = 2-naphthyl

Step-Economical Synthesis of Tetrahydroquinolines by Asymmetric Relay Catalytic Friedlander Condensation/Transfer Hydrogenation

L. Ren, T. Lei, J.-X. Ye,
L.-Z. Gong* ______________ **771–774**

Angew. Chem. Int. Ed. **2012**, *51*

DOI: 10.1002/anie.201106808