[9] As we were attempting to achieve oxidative azaspiroannulations, Ciufolini and co-workers described novel oxidative cyclizations of oxazolines produced from tyrosine–tyrosine dipeptides, which thus demonstrated for the first time that oxidative azaspiroannulations are viable reaction processes. See: a) N. A. Braun, M. A. Ciufolini, K. Peters, E.-M. Peters, *Tetrahedron Lett*. **1998**, *39*, 4667–4670; b) N. A. Braun, J. D. Bray, M. A. Ciufolini, *Tetrahedron Lett*. **1999**, *40*, 4985–4988; c) N. A. Braun, M. Ousmer, J. D. Bray, D. Bouchu, K. Peters, E.-M. Peters, M. A. Ciufolini, *J. Org. Chem*. **2000**, *65*, 4397–4408. This provocative reaction type is related to several interesting oxidative spiroannulations. For examples, see: d) A. V. R. Rao, M. K. Gurjar, P. A. Sharma, *Tetrahedron Lett*. **1991**, *32*, 6613–6616; e) P. Wipf, Y. Kim, *Tetrahedron Lett*. **1992**, *33*, 5477–5480; f) P. Wipf, Y. Kim, P. C. Fritch, *J. Org. Chem*. **1993**, *58*, 7195–7203; g) P. Wipf, Y. Kim, D. M. Goldstein, *J. Am. Chem. Soc*. **1995**, *117*, 11106–11112; h) A. McKillop, L. McLaren, R. J. K. Taylor, R. J. Watson, N. Lewis, *Synlett* **1992**, 201–203; i) A. McKillop, L. McLaren, R. J. K. Taylor, R. J. Watson, N. J. Lewis, *J. Chem. Soc. Perkin Trans. 1* **1996**, 1385–1393; j) K. Marshall Aubart, C. H. Heathcock, *J. Org. Chem*. **1999**, *64*, 16–22; k) D. Yang, M.-K. Wong, Z. Yan, *J. Org. Chem*. **2000**, *65*, 4179–4184.

[10] For applications of the aldol reaction in syntheses of bicyclo[3.3.1]-nonanes and azabicyclo[3.3.1]nonanes, see: a) W. A. Kinney, G. D. Crouse, L. A. Paquette, *J. Org. Chem*. **1983**, *48*, 4986–5000; b) R. J. K. Taylor, S. M. Turner, D. C. Horwell, O. W. Howarth, M. F. Mahon, K. C. Molloy, *J. Chem. Soc. Perkin Trans. 1* **1990**, 2145–2150; c) H.-J. Teuber, C. Tsaklakidis, J. W. Bats, *Liebigs Ann. Chem*. **1990**, 781–787; d) S. Patir, P. Rosenmund, P. H. Götz, *Heterocycles* **1996**, *43*, 15–22.

[11] Aldehyde **6** was prepared from the known amino ester **7** by the following reaction sequence: 1) 4-nitrobenzenesulfonyl chloride, iPr$_2$NEt, CH_2Cl_2, RT, 0.5 h, 88%; 2) MeI, K_2CO_3, DMF, RT, 1 h, 91%; 3) $AlCl_3$, EtSH, CH_2Cl_2, RT, 2.5 h, 92%; 4) $BH_3 \cdot THF$, THF, 0 °C, 1 h; then RT, 2 h, 94%; 5) $SO_3 \cdot pyr$, DMSO, iPr$_2$NEt, RT, 10 min, approximately 100% (**6** was used in crude form).

[12] A. F. Abdel-Magid, K. G. Carson, B. D. Harris, C. A. Maryanoff, R. D. Shah, *J. Org. Chem*. **1996**, *61*, 3849–3862.

[13] T. Fukuyama, C.-K. Jow, M. Cheung, *Tetrahedron Lett*. **1995**, *36*, 6373–6374.

[14] A. J. Mancuso, D. Swern, *Synthesis* **1981**, 165–185.

[15] Aldehyde **4** was used in crude form because partial epimerization at C-5 occurred during chromatography on silica. For stimulating discussions of the stability and chemistry of optically active α-amino aldehydes, see: A. G. Myers, D. W. Kung, B. Zhong, *J. Am. Chem. Soc*. **2000**, *122*, 3236–3237.

[16] Compound **5** was the major component of a mixture of three aldol cyclization products. The equatorial C-6 epimer of **5** was formed in approximately 19% yield and a compound tentatively assigned as a C6–C9 aldol adduct was obtained in approximately 21% yield.

[17] This aldol procedure affords **5** in 17% yield and a substance that we tentatively assigned as the C6–C9 aldol adduct in 12% yield (see ref. [16]). We have not yet been able to utilize the C-6 epimer of **5** in our synthesis.

[18] a) O. Mitsunobu, K. Kato, J. Kimura, *J. Am. Chem. Soc*. **1969**, *91*, 6510–6511; b) D. A. Campbell, J. C. Bermak, *J. Org. Chem*. **1994**, *59*, 658–660.

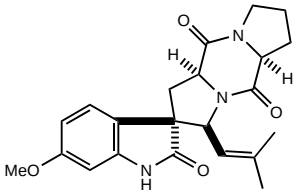
[19] The results of COSY, HMQC, and ROESY NMR spectroscopy experiments were fully consistent with the structure of compound **11**. In addition to **11**, a C8–C9 alkene was formed in 17% yield due to elimination.

[20] Mitsunobu reactions are sensitive to steric environments; therefore, site-selective modification of polyols is feasible. For examples, see: a) D. A. Evans, J. R. Gage, J. L. Leighton, *J. Am. Chem. Soc*. **1992**, *114*, 9434–9453; b) R. S. Coleman, J. R. Fraser, *J. Org. Chem*. **1993**, *58*, 385–392.

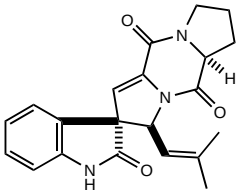
Total Synthesis of (−)-Spirotryprostatin B and Three Stereoisomers**

Larry E. Overman* and Mark D. Rosen

Small-molecule natural products play an important role in contemporary studies to understand and control cellular proliferation.[1] From the fermentation broth of the fungus *Aspergillus fumigatus*, Osada and co-workers recently identified a group of novel diketopiperazine alkaloids that inhibit G2/M phase progression of the mammalian cell cycle at micromolar concentrations.[2, 3] Spirotryprostatins A (**1**) and B (**2**) are the most complex of these alkaloids,[2] all of which appear to arise biosynthetically by prenylation of a diketopiperazine derived from tryptophan and proline.



Spirotryprostatin A (**1**)



Spirotryprostatin B (**2**)

The novelty of their structures and the potential utility of cell-cycle inhibitors make the spirotryprostatins attractive targets for total synthesis. If such an undertaking were to be stereocontrolled, a central challenge would be to relate the stereochemistry of the quaternary spiro carbon to the adjacent stereocenter bearing the 2-methylpropenyl side chain. In 1998, Danishefsky and co-workers reported the total synthesis of spirotryprostatin A (**1**), which constituted the first total synthesis in this area.[4] Earlier this year, the groups of Williams,[5] Danishefsky,[6] and Ganesan[7] disclosed inaugural total syntheses of (−)-spirotryprostatin B (**2**).

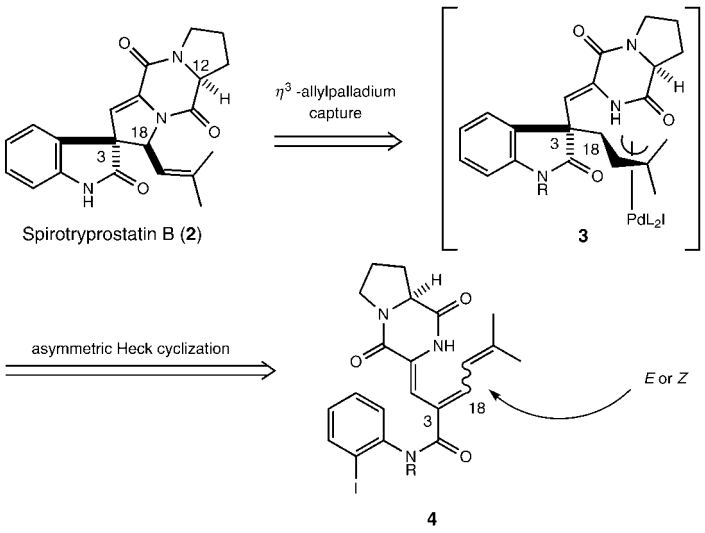
Our approach to spirotryprostatin B (**2**) and congeners is distinctly different from the previous syntheses (Scheme 1). The logic of our strategy is to correlate the relative configurations of C3 and C18 in **2**[8] to the geometry of the internal double bond of a triene cyclization substrate **4** by capitalizing on the stereochemical selectivity of two palladium-catalyzed

[*] Prof. L. E. Overman, M. D. Rosen
Department of Chemistry
University of California, Irvine
516 Rowland Hall, Irvine, CA 92697-2025 (USA)
Fax: (+1) 949-824-3866
E-mail: leoverma@uci.edu

[**] We thank NIH NIGMS (GM-30859) for financial support, Prof. A. J. Shaka and N. D. Taylor for DPFGSE experiments, Prof. H. Osada for providing spectral data for natural **1**, and Prof. R. M. Williams and P. R. Sebahar for providing spectral data and a sample of synthetic *ent*-**21**. We are also grateful to Prof. R. M. Williams and Prof. S. J. Danishefsky for open exchange of information prior to publication. NMR and mass spectra were determined at UC Irvine with instruments purchased with the assistance of the NSF and NIH shared instrumentation programs.

Supporting information for this article is available on the WWW under http://www.wiley-vch.de/home/angewandte/ or from the author.

 © WILEY-VCH Verlag GmbH, D-69451 Weinheim, 2000 1433-7851/00/3924-4596 $ 17.50+.50/0



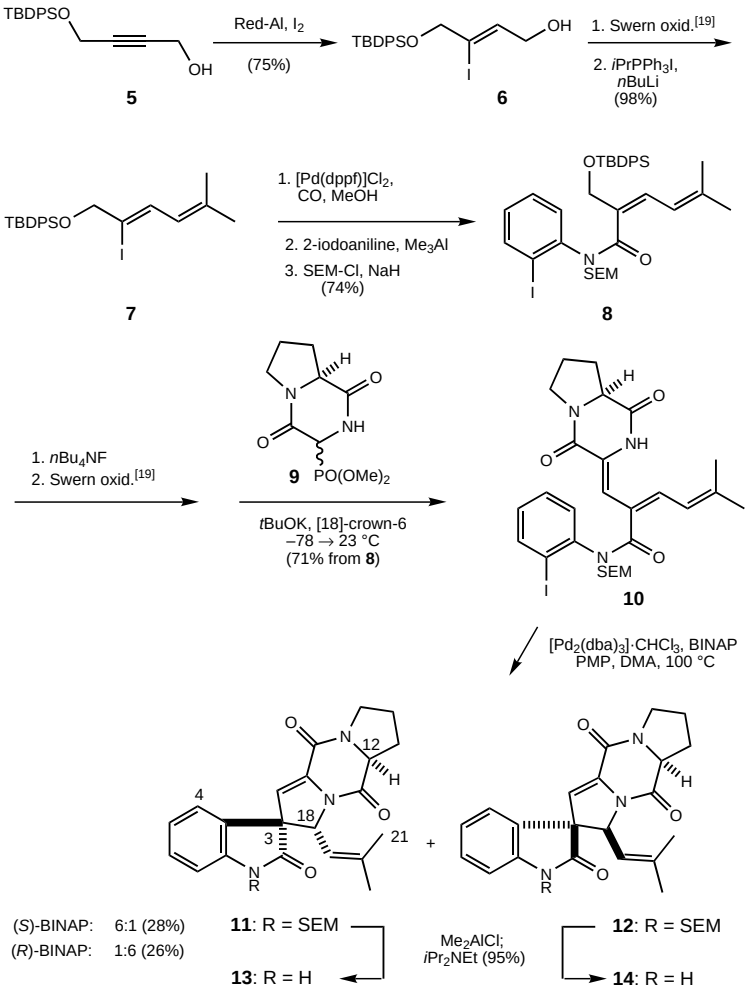
Scheme 1. Retrosynthesis of spirotryprostatin B (**2**). L = ligand.

reactions: Heck insertions[9] and trapping of η^3-allylpalladium intermediates by nitrogen nucleophiles.[10] Under control of an appropriate chiral ligand,[11] a suprafacial intramolecular Heck reaction of (*E*)-**4** in a favored 5-exo sense could generate η^3-allylpalladium intermediate **3**, which would not be expected to undergo facile stereomutation.[12] If reaction of intermediate **3** with the proximal nitrogen of the tethered diketopiperazine occurred *anti* to the metal, spirotryprostatin B (**2**) would be produced; trapping *syn* to the metal would lead to 18-*epi*-spirotryprostatin B.[13] Our strategy would have the flexibility to deal with either stereochemical outcome of the second step by modulation of the stereochemistry of the internal double bond of triene **4**.[14–16] Herein we disclose an investigation of the strategy adumbrated in Scheme 1, which culminated in enantioselective total syntheses of (−)-spirotryprostatin B (**2**) and three stereoisomers.

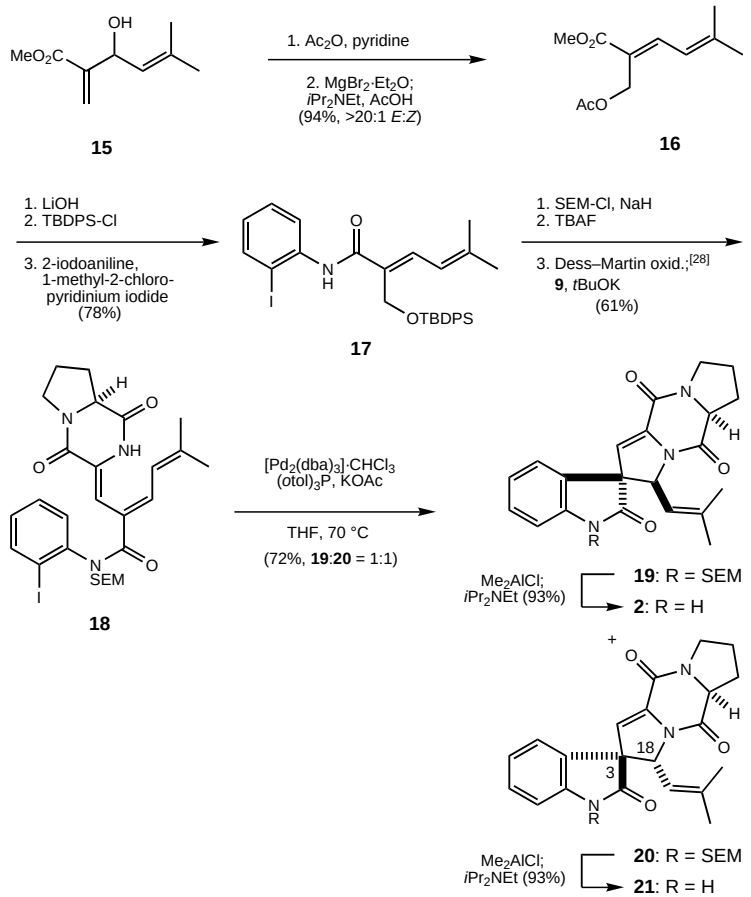
The preparation of triene cyclization substrate **10** began with alcohol **5**,[17] which was converted in high yield into dienyl iodide **7** as shown in Scheme 2.[18, 19] Palladium-catalyzed carbonylation of **7** in the presence of methanol,[20] aminolysis of the resulting ester with 2-iodoaniline,[21] and protection of the amide nitrogen with (2-trimethylsilyl)ethoxymethyl chloride (SEM-Cl) gave anilide **8** in 74% yield. Removal of the *tert*-butyldiphenylsilyl (TBDPS) group of **8**, followed by Swern oxidation[19] and reaction of the resulting aldehyde with the potassium salt of diketopiperazine phosphonate **9**[22] delivered isomerically pure **10** in 71% yield from **8**.

Cyclization of **10** with 20% Pd/(*S*)-BINAP and excess 1,2,2,6,6-pentamethylpiperidine (PMP) in *N*,*N*-dimethylacetamide (DMA) at 100°C[11] produced a 6:1 mixture of pentacycles **11** and **12** in 28% yield, while identical cyclization of **10** using Pd/(*R*)-BINAP proceeded with similar efficiency and selectivity to deliver **12** as the major pentacyclic product (**12**:**11** = 6:1). After some experimentation, we found that the SEM protecting group could be discharged in high yield from these delicate products by initial exposure to six equivalents of Me_2AlCl, followed by heating the resulting *N*-hydroxymethyl derivatives with diisopropylethylamine in methanol to remove the unit of formaldehyde. Analytically pure samples of 18-*epi*-spirotryprostatin B (**13**) and 3-*epi*-spirotryprostatin B (**14**) could be obtained from these mixtures by preparative HPLC. The *trans* relationship of the phenyl and 2-methylpropenyl groups of **13** and **14** was apparent from the large NOE enhancements observed in each case between H4 and H18, while the stereorelationship of the pyrrolidine and dihydropyrrole rings was established from long-range NOE enhancements observed between H12 and H21 of **13** by DPFGSE NOE experiments.[23, 24]

These Pd/BINAP-catalyzed double cyclizations of **10** demonstrate that the η^3-allylpalladium intermediate is generated and captured with high stereochemical fidelity, and that the nitrogen of the tethered diketopiperazine attacks the allylpalladium complex *anti* to the metal center. Consequently, we turned to the synthesis of the stereoisomeric cyclization



Scheme 2. Synthesis of 18-*epi*-spirotryprostatin B (**13**) and 3-*epi*-spirotryprostatin B (**14**). TBDPS = tBuPh$_2$Si, Red-Al = [(MeOCH$_2$CH$_2$O)$_2$AlH$_2$]Na, dppf = 1,1′-bis(diphenylphosphanyl)ferrocene, SEM = CH$_2$OCH$_2$CH$_2$SiMe$_3$, BINAP = 2,2′-bis(diphenylphosphino)-1,1′-binaphthyl, dba = (*E*,*E*)-dibenzylideneacetone, PMP = 1,2,2,6,6-tetramethylpiperidine, DMA = *N*,*N*-dimethylacetamide.



Scheme 3. Synthesis of spirotryprostatin B (**2**) and 3,18-bis-*epi*-spirotryprostatin B (**21**). TBAF = tetrabutylammonium fluoride, *o*tol = *ortho*-tolyl, see Scheme 2 for other abbreviations.

substrate **18** that should lead to spirotryprostatin B (**2**; Scheme 3).

The preparation of **18** began with allylic alcohol **15**.[25] The acetate derivative of **15** reacted cleanly with $MgBr_2 \cdot Et_2O$ to give the primary allylic bromide,[26] which was displaced with acetate to provide (*E*)-dienoate **16**. Conversion of **16** into the siloxycarboxylic acid and coupling[27] of this intermediate with 2-iodoaniline provided **17** in excellent overall yield. Following a sequence similar to that employed in the stereoisomeric series (**8** → **10**), **17** was elaborated to form isomerically pure **18** in 61% overall yield.[28, 29]

Cyclization of **18** with Pd/(*S*)-BINAP under conditions identical to those employed with stereoisomer **10** unexpectedly led to the formation of pentacycle **11**. Control experiments conducted in the absence of Pd/(*S*)-BINAP indicated that **18** underwent rapid isomerization of the internal double bond of the triene to give **10** when heated above 80°C in DMA with excess PMP. As a result, a wide variety of reaction conditions, including many with scavengers of HI less basic than PMP, were surveyed in an attempt to accomplish the asymmetric double cyclization under conditions that did not isomerize the triene unit of **18**. While these attempts met with failure, we did discover that cyclization of **18** with 10% $[Pd_2(dba)_3] \cdot CHCl_3$, 40 mol% tri-*o*-tolylphosphane, and excess KOAc in THF at 70°C cleanly led to the formation of a 1:1 mixture of pentacycles **19** and **20**. Removal of the SEM group from these products and chromatographic purification provided pure (−)-spirotryprostatin B (**2**; $[\alpha]_D^{23} = -159$ ($c = 0.40$, $CHCl_3$)) in 21% overall yield from **18**, as well as 3,18-bis-*epi*-spirotryprostatin B (**21**).[30]

In summary, (−)-spirotryprostatin B (**2**) was synthesized in 9% yield from methyl acrylate and 3-methyl-2-butenal (the commercially available precursors of **15**) by way of ten isolated intermediates. This synthesis and the related syntheses of stereoisomers **13**, **14**, and **21**, introduce a new strategy for stereocontrolled construction of quaternary spiro and adjacent stereocenters. Moreover, this investigation shows for the first time that a) intramolecular Heck insertions of conjugated trienes can proceed with high regioselectivity, b) η^3-allylpalladium intermediates can be trapped by the nitrogen of a tethered diketopiperazines, and c) the latter reactions proceed with *anti* stereochemistry. These methodological advances further expand the potential applications of organopalladium chemistry in the construction of complex heterocyclic ring systems.

Received: August 21, 2000 [Z15668]

[1] a) D. T. Hung, T. F. Jamison, S. L. Schreiber, *Chem. Biol.* **1996**, *3*, 623 – 639; H. Osada, *J. Antibiot.* **1998**, *51*, 973 – 982.

[2] a) C. B. Cui, H. Kakeya, H. Osada, *J. Antibiot.* **1996**, *49*, 832 – 835; b) C. B. Cui, H. Kakeya, H. Osada, *Tetrahedron* **1996**, *52*, 12651 – 12666.

[3] a) C. B. Cui, H. Kakeya, H. Osada, *Tetrahedron* **1997**, *53*, 59 – 72; b) C. B. Cui, H. Kakeya, G. Okada, R. Onose, I. Ubukata, K. Takahashi, K. Isono, H. Osada, *J. Antiobiot.* **1995**, *48*, 1382 – 1384; c) C. B. Cui, H. Kakeya, G. Okada, R. Onose, H. Osada, *J. Antiobiot.* **1996**, *49*, 527 – 533; d) C. B. Cui, H. Kakeya, H. Osada, *J. Antiobiot.* **1996**, *49*, 534 – 540.

[4] a) S. Edmondson, S. J. Danishefsky, *Angew. Chem.* **1998**, *110*, 1190 – 1193; *Angew. Chem. Int. Ed.* **1998**, *37*, 1138 – 1140; b) S. Edmondson, S. J. Danishefsky, L. Sepp-Lorenzino, N. Rosen, *J. Am. Chem. Soc.* **1999**, *121*, 2147 – 2155.

[5] P. R. Sebahar, R. M. Williams, *J. Am. Chem. Soc.* **2000**, *122*, 5666 – 5667.

[6] F. von Nussbaum, S. J. Danishefsky, *Angew. Chem.* **2000**, *112*, 2259 – 2262; *Angew. Chem. Int. Ed.* **2000**, *39*, 2175 – 2178.

[7] H. Wang, A. Ganesan, *J. Org. Chem.* **2000**, *65*, 4685 – 4693.

[8] The absolute configuration and relative stereochemistry of spirotryprostatin B (**2**) at C12 were not defined in the original reports.[2] Consequently, we chose to develop a synthetic approach that would allow access to all possible stereochemical perturbations. These stereochemical issues were first resolved by the total syntheses of **2** by the groups of Williams and Danishefsky.[5, 6]

[9] For recent reviews, see: a) A. de Meijere, F. E. Meyer in *Metal-Catalyzed Cross-Coupling Reactions* (Eds.: P. J. Stang, F. Diederich), Wiley-VCH, Weinheim, **1998**, Chap. 3; b) J. T. Link, L. E. Overman in *Metal-Catalyzed Cross-Coupling Reactions* (Eds.: P. J. Stang, F. Diederich), Wiley-VCH, Weinheim, **1998**, Chap. 6. For reviews of asymmetric Heck reactions, see: c) Y. Donde, L. E. Overman in *Catalytic Asymmetric Synthesis* (Ed.: I. Ojima), 2nd ed., Wiley, New York, **2000**, Chap. 8G; d) M. Shibasaki in *Advances in Metal-Organic Chemistry* (Ed.: L. S. Liebeskind), JAI, Greenwich, **1996**, pp. 119 – 151.

[10] For a review of palladium-catalyzed allylation of nitrogen, see: P. Metz, *Methoden Org. Chem. (Houben-Weyl) 4th ed. 1952 –*, *Vol. E21/2*, pp. 5643 – 5669.

[11] a) A. Ashimori, B. Bachand, L. E. Overman, D. Poon, *J. Am. Chem. Soc.* **1998**, *120*, 6477 – 6487; b) A. Ashimori, B. Bachand, M. Calter,

 © WILEY-VCH Verlag GmbH, D-69451 Weinheim, 2000 1433-7851/00/3924-4598 $ 17.50+.50/0

S. P. Govek, L. E. Overman, D. J. Poon, *J. Am. Chem. Soc.* **1998**, *120*, 6488 – 6499.
[12] Epimerization of this intermediate by a $\pi-\sigma-\pi$ mechanism would be unfavorable, since the termini of **3** are disubstituted and neopentylic.
[13] Although *anti* attack on η^3-allylpalladium intermediates is observed with most soft nucleophiles, there are no close precedents for capture by neutral amides. See: A. Heumann, M. Réglier, *Tetrahedron* **1995**, *51*, 975 – 1015, and ref. [10].
[14] The synthesis of annulated indoles by bimolecular coupling of 2-haloanilines with dienes has been extensively developed by Larock and co-workers.[15] The coupling of an asymmetric intramolecular Heck reaction with bimolecular trapping of an π^3-allylpalladium intermediate was first described by Shibasaki and co-workers.[16] The stereochemical issues that are at the heart of the present investigation were not probed in these earlier studies.
[15] For a review, see: R. C. Larock, *J. Organomet. Chem.* **1999**, *576*, 111 – 124.
[16] a) K. Kagechika, M. Shibasaki, *J. Org. Chem.* **1991**, *56*, 4093 – 4094. For earlier examples with achiral palladium catalysts, see: b) B. Burns, R. Grigg, P. Ratananukul, V. Sridharan, P. Stevenson, T. Worakun, *Tetrahedron Lett.* **1988**, *29*, 4329 – 4332; c) R. Grigg, V. Sridharan, S. Sukirthalingam, T. Worakun, *Tetrahedron Lett.* **1989**, *30*, 1139 – 1142.
[17] C. K. Hwang, W. S. Li, K. C. Nicolaou, *Tetrahedron Lett.* **1984**, *25*, 2295 – 2298.
[18] a) E. J. Corey, J. A. Katzenellenbogen, G. H. Posner, *J. Am. Chem. Soc.* **1967**, *89*, 4245 – 4247; b) M. A. Blanchette, M. S. Malamas, M. H. Nantz, J. C. Roberts, P. Somjai, D. C. Whritenour, S. Masamune, M. Kageyama, T. Tamura, *J. Org. Chem.* **1989**, *54*, 2817 – 2825.
[19] A. J. Mancuso, D. Swern, *Synthesis* **1981**, 165 – 185.
[20] Review: J. Tsuji, *Palladium Reagents and Catalysts: Innovations in Organic Synthesis*, Wiley, Chichester, **1997**, pp. 188 – 209.
[21] M. F. Lipton, A. Basha, S. M. Weinreb, *Org. Synth. Coll. Vol.* **1988**, *6*, 492 – 495.
[22] A. Lieberknecht, H. Griesser, *Tetrahedron Lett.* **1987**, *28*, 4275 – 4278.
[23] a) K. Stott, J. Stonehouse, J. Keeler, T. L. Hwang, A. J. Shaka, *J. Am. Chem. Soc.* **1995**, *117*, 4199 – 4200; b) K. Stott, J. Keeler, Q. N. Van, A. J. Shaka, *J. Magn. Reson.* **1997**, *125*, 302 – 324.
[24] These experiments are in full accord with the assignments of von Nussbaum and Danishefsky.[6] Other spectroscopic and analytical data for these products were also in accord to those reported.
[25] T. Janecki, *Synth. Commun.* **1993**, *23*, 641 – 650.
[26] D. Basavaiah, A. K. D. Bhavani, S. Pandiaraju, P. K. S. Sarma, *Synlett* **1995**, 243 – 244.
[27] E. Bald, K. Saigo, T. Mukaiyama, *Chem. Lett.* **1975**, 1159 – 1162.
[28] D. B. Dess, J. C. Martin, *J. Org. Chem.* **1983**, *48*, 4155 – 4156.
[29] The (*E*)-dienyl aldehyde intermediate in this sequence underwent facile stereomutation; its generation and successful condensation with **9** required strict attention to experimental detail (see Supporting Information).
[30] Spectroscopic and analytical data for these products were in accord with those reported.[2, 5]

Reconstitution of Channel Proteins in (Polymerized) ABA Triblock Copolymer Membranes**

Wolfgang Meier,* Corinne Nardin, and Mathias Winterhalter

Lipid bilayers are the basic constituent of biological membranes. The lipids serve as a fluid matrix for membrane or membrane-associated proteins, which are responsible for various key functions such as signaling or transport. Many of these membrane proteins are pharmacologically important or have biotechnological potential. For such applications one has to immobilize them in an artificial membrane system. This creates a biosensor which can be used, for example, for rapid drug screening. The great advantage of planar freestanding films is the direct access to both sides of the membrane. Thus, these can be applied to carry out, for example, conductance measurements to monitor transport processes across membranes or to detect minor changes on reconstituted channel-forming membrane proteins. An early model system for freestanding films was the so-called "black lipid membranes", named as such because during the thinning out of the membrane the intensity of the reflected light vanishes and the membrane appears black in the reflected light. In addition to their biological functions, lipid membranes have unique material properties; for instance, they are extremely flexible but at the same time mechanically very stable. In contrast, artificial, freestanding membranes were always fragile and thus of little technological interest. Above a certain size, supported lipid membranes contain defects, which rules out conductance measurements as a recording technique. Herein we present a new type of matrix for membrane proteins. This material is stable and defect-free and allows the formation of giant dense planar membranes.

Similar to conventional lipids, amphiphilic block copolymers may also form membrane-like superstructures in aqueous solution.[1–6] Hence they can be regarded as higher molecular weight analogues of lipids. Moreover, the high diversity of block copolymer chemistry may lead to a plethora of new artificial membrane structures inaccessible with conventional lipids. For example, it is possible to vary the molecular weight, the block – length ratio, the chemical constitution, or even the molecular architecture of these molecules. Owing to their larger size and their slower dynamics, amphiphilic block copolymers may lead to signifi-

[*] Priv.-Doz. Dr. W. Meier, Dipl.-Phys. C. Nardin
Institut für Physikalische Chemie
Universität Basel
Klingelbergstrasse 80, 4056 Basel (Switzerland)
Fax: (+41) 61-2673855
E-mail: wolfgang.meier@unibas.ch
Prof. Dr. M. Winterhalter
IPBS-CNRS UPR 9062, Université Paul Sabatier
31077 Toulouse (France)

[**] This work was supported by the Swiss National Science Foundation. We thank Dr. T. Hirt and Dr. J. Leukel for the synthesis of the triblock copolymer, Dr. P. Van Gelder and Dr. F. Dumas for bright and helpful discussions, and T. Haefele for his contribution to the experimental part.

 © WILEY-VCH Verlag GmbH, D-69451 Weinheim, 2000 1433-7851/00/3924-4599 $ 17.50+.50/0