Supporting Information

A New Radical-Based Route to Calothrixin B

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General.

Reaction courses and product mixtures were routinely monitored by TLC on silica gel (precoated F₂₅₄ Merck plates). Drying of organic extracts during the workup of reactions was performed over anhydrous Na₂SO₄. The solvents were evaporated under reduced pressure with a rotatory evaporator. Flash chromatography was carried out on SiO₂ (silica gel 60, SDS, 0.04–0.06 mm). Melting points are uncorrected. Unless otherwise indicated, ¹H and ¹³C NMR spectra were recorded in CDCl₃ solution, using TMS as an internal reference.

Methyl 1-(*t*-Butoxycarbonyl)-3-formyl-2-indolecarboxylate (**2**).

A solution of 3-formyl-1*H*-2-indolecarboxylate¹ (1.20 g, 5.91 mmol), (Boc)₂O (1.55 g, 7.10 mmol), DMAP (0.14 g, 1.15 mmol) and Et₃N (0.82 mL, 5.91 mmol) in dry CH₂Cl₂ (60 mL) was stirred at rt for 5 h. The reaction mixture was poured into a saturated aqueous solution of NaHCO₃ (50 mL) and extracted with CH₂Cl₂ (2 x 40 mL). The organic extracts were dried and concentrated, and the crude product was purified by flash chromatography (8:2 hexanes-AcOEt) to give **2** as a yellow solid: 1.72 g (96%); mp 90–2°C; ¹H NMR (200 MHz) δ 1.67 (s, 9H), 4.04 (s, 3H), 7.45 (m, 2H), 8.09 (d, *J* = 7.8 Hz, 1H), 8.35 (d, *J* = 8 Hz, 1H), 10.20 (s, 1H); ¹³C NMR (50.3 MHz) δ 27.8 (CH₃), 53.2 (CH₃), 86.6 (C), 114.7 (CH), 120.9 (C), 122.8 (CH), 124.6 (C), 125.1 (CH), 127.3 (CH), 135.6 (C), 137.5 (C), 148.1 (C), 161.4 (C), 185.8 (CH). Anal. Calcd for C₁₆H₁₇NO₅: C, 63.36; H, 5.65; N, 4.62. Found: C, 63.71; H, 5.60; N, 4.48.

Methyl Esters **3,4**.

n-BuLi (1.6 M in hexane, 0.79 mL, 1.27 mmol) was added under Ar to a cooled (–78°C) solution of diisopropylamine (0.17 mL, 1.21 mmol) in dry THF (3 mL), and the resulting solution was stirred at –78°C for 0.5 h. Then, 2-bromoquinoline² (0.23 g, 1.10 mmol) in dry THF (3 mL) was added, and the resulting mixture was stirred at –78°C for 2 h. A solution of aldehydes **1**¹ or **2** (1.10 mmol) in dry THF (10 mL) was added, and the mixture was allowed to slowly warm to 0°C. The reaction mixture was poured into a saturated aqueous solution of NH₄Cl (20 mL) and extracted with CH₂Cl₂ (3 x 30 mL). The organic extracts were concentrated to give the crude carbinols.

Et₃SiH (0.87 mL, 5.28 mmol) was added to a cooled (0°C) solution of above carbinols in TFA (7 mL). After stirring at rt for 5 h, the solution was concentrated to dryness. The residue was dissolved with CH₂Cl₂ (25 mL), and the organic solution was washed with 2M Na₂CO₃ (3 x 20 mL), dried and concentrated. The crude product was chromatographed. Yields, elution and NMR data are given below.

Methyl 3-[(2-Bromo-3-quinolyl)methyl]-1-methyl-2-indolecarboxylate (3**):** 55%; elution with 8:2 hexanes-AcOEt; mp 194–6°C; ¹H NMR (200 MHz) δ 3.80 (s, 3H), 4.14 (s, 3H), 4.67 (s, 2H), 7.14 (m, 1H), 7.35–7.65 (m, 7H), 8.02 (d, *J* = 8.8 Hz, 1H); ¹³C NMR (100.6 MHz) δ 31.0 (CH₂), 32.3 (CH₃), 51.7 (CH₃), 110.4 (CH), 119.8 (C), 120.6 (CH), 120.7 (CH), 125.7 (CH), 125.8 (C), 126.7 (C), 126.8 (CH), 127.3 (CH), 127.6 (C), 128.1 (CH), 129.5 (CH), 135.1 (C), 136.0 (CH), 138.9 (C), 144.9 (C), 146.9 (C), 162.8 (C). Anal. Calcd for C₂₁H₁₇BrN₂O₂: C, 61.63; H, 4.19; N, 6.84. Found: C, 61.65; H, 4.36; N, 6.75.

Methyl 3-[(2-Bromo-3-quinolyl)methyl]-1*H*-2-indolecarboxylate (4**):** 65%; elution with 6:4 hexanes-AcOEt; ¹H NMR (DMSO-*d*₆, 400 MHz) δ 3.80 (s, 3H), 4.64 (s, 2H), 7.00 (t, *J* = 7.6 Hz, 1H), 7.28 (t, *J* = 7.6 Hz, 1H), 7.50 (m, 3H), 7.59 (s, 1H), 7.73 (ddd, *J* = 1.2, 6.8, 8.4 Hz,

1H), 7.77 (d, $J = 8$ Hz, 1H), 7.93 (d, $J = 8.4$ Hz, 1H), 11.95 (br s, 1H); ^{13}C NMR (100.6 MHz) δ 30.1 (CH_2), 51.9 (CH_3), 112.9 (CH), 118.3 (C), 120.2 (CH), 120.4 (CH), 124.3 (C), 125.3 (CH), 127.2 (C), 127.3 (C), 127.4 (CH), 127.6 (CH), 127.9 (CH), 130.2 (CH), 134.9 (C), 136.3 (CH), 136.7 (C), 144.7 (C), 146.5 (C), 162.0 (C). Anal. Calcd for $\text{C}_{22}\text{H}_{19}\text{BrN}_2\text{O}_3$: C, 60.15; H, 4.36; N, 6.38. Found: C, 60.32; H, 4.54; N, 6.20.

Methyl Esters 5,6.

A solution of the bromo derivative **3** or **4** (1.50 mmol), $n\text{-Bu}_3\text{SnH}$ (1 mL, 3.77 mmol) and AIBN (25 mg, 0.15 mmol) in C_6H_6 (15 mL) was stirred at reflux for 2 h. The reaction mixture was concentrated under reduced pressure. The resulting residue was partitioned between hexanes (20 mL) and acetonitrile (20 mL) and the polar layer was washed with hexanes (3 x 20 mL). The solvent was removed, and the crude product was purified by flash chromatography. Yields, elution and NMR data are given below.

Methyl 1-Methyl-3-[(3-quinolyl)methyl]-2-indolecarboxylate (5): 90%; elution with 7:3 hexanes-AcOEt; mp 93-5°C; ^1H NMR (200 MHz) δ 3.87 (s, 3H), 4.05 (s, 3H), 4.63 (s, 2H), 7.13 (m, 1H), 7.35-7.45 (m, 3H), 7.55-7.70 (m, 3H), 7.80 (s, 1H), 8.04 (d, $J = 8$ Hz, 1H), 8.92 (d, $J = 2.2$ Hz, 1H); ^{13}C NMR (50.3 MHz) δ 28.7 (CH_2), 32.3 (CH_3), 51.6 (CH_3), 110.3 (CH), 120.4 (CH), 120.6 (CH), 121.5 (C), 125.5 (CH), 126.4 (CH), 126.5 (C), 127.4 (CH), 128.1 (C), 128.5 (CH), 128.9 (CH), 133.9 (CH), 134.1 (C), 138.8 (C), 146.6 (C), 151.7 (CH), 162.8 (C). Anal. Calcd for $\text{C}_{21}\text{H}_{18}\text{N}_2\text{O}_2$: C, 76.34; H, 5.49; N, 8.48. Found: C, 76.31; H, 5.53; N, 8.27.

Methyl 3-[(3-Quinolyl)methyl]-1H-2-indolecarboxylate (6): 90%; elution with CH_2Cl_2 and then 98:2 CH_2Cl_2 -MeOH; ^1H NMR (200 MHz) δ 3.94 (s, 3H), 4.68 (s, 2H), 7.13 (ddd, $J = 1.6, 6.6, 8.2$ Hz, 1H), 7.30-7.50 (m, 3H), 7.55-7.70 (m, 3H), 7.88 (s, 1H), 8.04 (d, $J = 8$ Hz, 1H), 8.85 (br s, 1H), 8.95 (d, $J = 2.2$ Hz, 1H); ^{13}C NMR (50.3 MHz) δ 28.0 (CH_2), 51.8 (CH_3), 112.0 (CH), 120.5 (CH), 120.6 (CH), 120.9 (C), 125.7 (CH), 126.5 (CH), 126.6 (C), 127.4 (CH), 128.1 (C), 128.4 (CH), 128.8 (CH), 133.9 (C), 134.5 (CH), 136.1 (C), 146.2 (C), 151.4 (CH), 162.5 (C). Anal. Calcd for $\text{C}_{20}\text{H}_{16}\text{N}_2\text{O}_2 \cdot 1/2\text{H}_2\text{O}$: C, 73.83; H, 5.27; N, 8.61. Found: C, 73.64; H, 5.06; N, 8.41.

Methyl 1-(Methoxymethyl)-3-[(3-quinolyl)methyl]-2-indolecarboxylate (7).

A solution of **6** (0.31 g, 1 mmol) in dry THF (8 mL) was added dropwise under Ar to an ice-cooled suspension of NaH (1.30 mmol) in dry THF (2 mL). After stirring at 0°C for 1 h, chloromethyl methyl ether (0.12 mL, 1.53 mmol) was added and the mixture was allowed to warm to rt for 5 h. The reaction mixture was poured into H_2O (5 mL) and extracted with CH_2Cl_2 (3 x 10 mL). The organic extracts were dried and concentrated and the resulting residue was chromatographed (7:3 hexanes-AcOEt) to give **7** as an oil: 0.32 g (90%); ^1H NMR (200 MHz) δ 3.29 (s, 3H), 3.89 (s, 3H), 4.64 (s, 2H), 5.97 (s, 2H), 7.18 (t, $J = 8$ Hz, 1H), 7.40 (m, 2H), 7.55-7.70 (m, 4H), 7.81 (d, $J = 1.4$ Hz, 1H), 8.06 (d, $J = 8.4$ Hz, 1H), 8.93 (d, $J = 2.2$ Hz, 1H); ^{13}C NMR (50.3 MHz) δ 28.7 (CH_2), 51.8 (CH_3), 56.1 (CH_3), 75.1 (CH_2), 111.0 (CH), 120.7 (CH), 121.4 (CH), 123.4 (C), 124.8 (C), 126.2 (CH), 126.5 (CH), 127.0 (C), 127.4 (CH), 128.1 (C), 128.6 (CH), 128.7 (CH), 133.7 (C), 134.2 (CH), 139.1 (C), 146.3 (C), 151.4 (CH), 162.4 (C). Anal. Calcd for $\text{C}_{21}\text{H}_{20}\text{N}_2\text{O}_3$: C, 72.40; H, 5.79; N, 8.04. Found: C, 72.79; H, 5.73; N, 7.68.

Selenoesters 8,9.

A solution of methyl ester **5** or **7** (1.30 mmol) and LiOH·H₂O (65 mg, 1.56 mmol) in a 3:1 mixture of THF-H₂O (10 mL) was stirred at 65°C for 5 h. The reaction mixture was concentrated and acidified with aqueous 1 N HCl until pH= 6. The precipitated carboxylic acid was collected by filtration.

A suspension of the above carboxylic acid (1 mmol) in anhydrous CH₂Cl₂ (7 mL) was treated with Et₃N (2 mmol). After 15 min at rt, the mixture was concentrated under reduced pressure to give the respective triethylammonium salt.

In another flask, tributylphosphine (2.50 mmol) was added under Ar to a solution of PhSeCl (2.50 mmol) in anhydrous THF (7 mL), and the mixture was stirred at rt for 10 min (yellow solution). The above triethylammonium salt in THF (7 mL) was added to this solution and the resulting mixture was stirred overnight. The reaction mixture was partitioned between CH₂Cl₂ (25 mL) and H₂O (25 mL) and extracted with CH₂Cl₂ (3 x 15 mL). The solvent was removed and the crude product was purified. Yields, methods of purification and NMR data are given below.

Se-Phenyl 1-Methyl-3-[(3-quinolyl)methyl]-2-indolecarboselenoate (8): 85%; oil that crystallizes on standing, washed with cold hexanes; mp 158-60°C; ¹H NMR (200 MHz) δ 4.00 (s, 3H), 4.87 (s, 2H), 7.15 (m, 1H), 7.40-7.45 (m, 5H), 7.50-7.65 (m, 4H), 7.76 (m, 2H), 8.09 (s, 1H), 8.35 (d, *J* = 8.2 Hz, 1H), 8.95 (s, 1H); ¹³C NMR (75.4 MHz) δ 28.9 (CH₃), 32.5 (CH₃), 110.6 (CH), 118.3 (C), 120.8 (CH), 121.0 (CH), 125.8 (C), 126.3 (CH), 126.8 (C), 127.1 (CH), 127.5 (CH), 127.8 (CH), 128.1 (C), 129.3 (CH), 129.4 (CH), 129.6 (CH), 133.4 (C), 134.6 (C), 135.9 (CH), 136.0 (CH), 138.7 (C), 145.1 (C), 150.2 (CH), 185.6 (C). Anal. Calcd for C₂₆H₂₀N₂OSe: C, 68.57; H, 4.43; N, 6.15. Found: C, 68.53; H, 4.42; N, 6.05.

Se-Phenyl 1-(Methoxymethyl)-3-[(3-quinolyl)methyl]-2-indolecarboselenoate (9): 80%; flash chromatography, elution with 6:4 hexanes-AcOEt; yellow oil; ¹H NMR (300 MHz) δ 3.29 (s, 3H), 4.85 (s, 2H), 5.77 (s, 2H), 7.16 (ddd, *J* = 0.9, 6.9, 7.8 Hz, 1H), 7.40-7.44 (m, 5H), 7.45-7.60 (m, 4H), 7.66 (d, *J* = 7.5 Hz, 2H), 7.82 (s, 1H), 8.09 (d, *J* = 8.1 Hz, 1H), 8.99 (d, *J* = 2.4 Hz, 1H); ¹³C NMR (75.4 MHz) δ 29.0 (CH₃), 56.1 (CH₃), 75.3 (CH₂), 111.4 (CH), 120.3 (C), 121.1 (CH), 121.7 (CH), 125.9 (C), 126.7 (CH), 127.4 (C), 127.5 (CH), 128.1 (C), 128.9 (CH), 129.0 (CH), 129.3 (CH), 129.5 (2 CH), 132.8 (C), 134.5 (CH), 136.0 (CH), 138.7 (C), 146.7 (C), 151.5 (CH), 186.3 (C); HRMS (ESI) calcd for C₂₇H₂₃N₂O₂Se 487.0919 (M+1), found 487.0922.

Radical Cyclization of Selenoester 8 under TTMSS-AIBN Conditions.

A solution of selenoester **8** (74 mg, 0.16 mmol), TTMSS (0.10 mL, 0.33 mmol) and AIBN (54 mg, 0.33 mmol) in C₆H₆ (6 mL) was added over a period of 5 h to heated (reflux) C₆H₆ (10 mL). After an additional 1 h at reflux, TTMSS (24 μL, 0.080 mmol) and AIBN (14 mg, 0.080 mmol) were added, and the reaction mixture was stirred at reflux for 2 h more. The solution was concentrated and the resulting residue was partitioned between acetonitrile (10 mL) and hexanes (10 mL) and the polar layer was washed with hexanes (3 x 10 mL). The solvent was removed and the crude product was chromatographed (hexanes and 7:3 hexanes-AcOEt) to give pentacycle **10** as a yellow solid: 38 mg (65%); mp 222-4 °C; ¹H NMR (500 MHz, assignment aided by HSQC and HMBC) δ 1.26 (s, 3H, Me), 1.47 (s, 3H, Me), 4.22 (s, 3H, NMe), 4.80 (s, 1H, 7-H), 7.25 (m, 1H, 9-H), 7.43 (ad, 2H, 10-H, 11-H), 7.73 (ddd, *J* = 1.5, 7, 8.5 Hz, 1H, 2-H),

7.78 (ddd, $J = 1.5, 7, 8.5$ Hz, 1H, 3-H), 7.84 (d, $J = 8.5$ Hz, 1H, 8-H), 8.18 (dd, $J = 1, 8.5$ Hz, 1H, 4-H), 9.30 (s, 1H, 6-H), 9.68 (dd, $J = 1, 8.5$ Hz, 1H, 1-H); ^{13}C NMR (100.6 MHz, assignment aided by HSQC and HMBC) δ 24.6 (Me), 26.7 (Me), 31.5 (NMe), 40.7 (C-CN), 44.9 (C-7), 110.8 (C-11), 121.3 (C-9), 121.6 (C-7a), 122.5 (C-8), 123.5 (CN), 124.5 (C-13b), 124.8 (C-7a), 126.5 (C-1), 126.8 (C-10), 129.0 (C-2), 129.8 (C-3), 130.0 (C-4), 133.7 (C-6a), 133.8 (C-12a), 136.3 (C-13a), 139.5 (C-11a), 148.8 (C-4a), 151.2 (C-6), 180.7 (C-13); CI-MS m/z 366 (MH^+), 299. Anal. Calcd for $\text{C}_{24}\text{H}_{19}\text{N}_3\text{O}$: C, 78.88; H, 5.24; N, 11.50: Found: C, 78.52; H, 5.22; N, 11.23.

12-Methyl-12*H*-indolo[3,2-*j*]phenanthridine-7,13-dione (*N*-methylcalothrixin, **11**).

Tetracycle **10** (36 mg, 0.10 mmol) was treated with a 0.5 M solution of KOH in MeOH (3 mL) at rt for 8 h. The solvent was removed and the resulting residue was partitioned between CH_2Cl_2 and H_2O , and extracted with CH_2Cl_2 . The organic extracts were dried and concentrated to give pure **11** as an orange solid: 29 mg (95%); mp 260–2°C; ^1H NMR ($\text{DMSO}-d_6$, 300 MHz, assignment aided by HSQC and HMBC) δ 4.24 (s, 3H, NMe), 7.45 (t, $J = 7.8$ Hz, 1H, 9-H), 7.55 (ddd, $J = 1.2, 6.9, 8.1$ Hz, 1H, 10-H), 7.82 (d, $J = 9$ Hz, 1H, 11-H), 7.88 (t, $J = 8.4$ Hz, 1H, 2-H), 7.95 (t, $J = 6.9$ Hz, 1H, 3-H), 8.17 (d, $J = 7.8$ Hz, 1H, 4-H), 8.25 (d, $J = 7.8$ Hz, 1H, 8-H), 9.51 (d, $J = 8.7$ Hz, 1H, 1-H), 9.61 (s, 1H, 6-H); ^1H NMR (CDCl_3 , 200 MHz) δ 4.29 (s, 3H), 7.40–7.50 (m, 3H), 7.80 (m, 2H), 8.20 (d, $J = 8$ Hz, 1H), 8.43 (d, $J = 7.8$ Hz, 1H), 9.59 (d, $J = 8$ Hz, 1H), 9.80 (s, 1H); ^{13}C NMR ($\text{DMSO}-d_6$, 100.6 MHz, assignment aided by HSQC and HMBC) δ 32.2 (NMe), 112.3 (C-11), 122.2 (C-7b), 122.3 (C-8), 122.4 (C-13b), 124.2 (C-6a), 124.9 (C-9), 127.1 (C-10), 127.4 (C-1), 129.9 (C-4), 130.1 (C-2), 131.5 (C-3), 133.6 (C-13a), 136.2 (C-12a), 139.7 (C-11a), 147.1 (C-6), 151.2 (C-4a), 180.3 (C-7); C-7a and C-13, not observed. Anal. Calcd for $\text{C}_{20}\text{H}_{12}\text{N}_2\text{O}_2 \cdot 2\text{H}_2\text{O}$: C, 68.96; H, 4.63; N, 8.04. Found: C, 68.53; H, 4.83; N, 8.47.

Radical Cyclization of Selenoester 8 under AIBN-Sun Lamp Conditions. AIBN (66 mg, 0.40 mmol) was added in eight portions (0.05 mmol every 1.5 h) to a refluxed solution of selenoester **8** (45 mg, 0.10 mmol) in C_6H_6 (5 mL) under 300 W sun lamp irradiation. The solvent was removed and the resulting residue was treated with a 0.5 M solution of KOH in MeOH (3 mL) at rt for 8 h. The solvent was removed and the resulting residue was partitioned between CH_2Cl_2 and H_2O , and extracted with CH_2Cl_2 . The organic extracts were dried and concentrated, and the resulting residue was chromatographed (6:4 hexanes-AcOEt) to give **11**: 23 mg (75%).

Radical Cyclization of Selenoester 9 under TTMSS-AIBN Conditions.

A solution of selenoester **9** (40 mg, 0.082 mmol), TTMSS (50 μL , 0.164 mmol) and AIBN (27 mg, 0.164 mmol) in C_6H_6 (3 mL) was added over a period of 4 h to heated (reflux) C_6H_6 (5 mL). After an additional 1 h at reflux, the solution was concentrated and the resulting residue was partitioned between acetonitrile (5 mL) and hexanes (5 mL) and the polar layer was washed with hexanes (3 x 5 mL). The solvent was removed and the crude product was chromatographed (1:1 hexanes-AcOEt) to give phenol **12** as an orange oil: 24 mg (90%); ^1H NMR (200 MHz) δ 3.65 (s, 3H), 5.86 (s, 2H), 7.37 (t, $J = 7.2$ Hz, 1H), 7.53 (t, $J = 7.4$ Hz, 1H), 7.61 (d, $J = 7.4$ Hz,

1H), 7.70 (m, 2H), 8.20 (m 2H), 8.31 (s, 1H), 9.33 (s, 1H), 9.77 (d, $J = 7.4$ Hz, 1H); ^{13}C NMR (75.4 MHz) δ 56.0 (CH_3), 76.2 (CH_2), 108.6 (CH), 112.8 (CH), 119.8 (C), 121.0 (CH), 121.3 (CH), 123.6 (C), 123.9 (C), 125.1 (C), 126.4 (CH), 127.5 (CH), 127.7 (CH), 128.1 (CH), 129.3 (CH), 131.3 (C), 140.7 (C), 142.4 (C), 144.1 (C), 154.3 (CH), indole C-3, not observed; HRMS (ESI) calcd for $\text{C}_{21}\text{H}_{17}\text{N}_2\text{O}_2$ 329.1285 ($\text{M}+1$), found 329.1282.

12-(Methoxymethyl)-12H-indolo[3,2-*j*]phenanthridine-7,13-dione (N-MOM calothrixin 13).

Phenol **12** (20 mg, 0.060 mmol) in a 5:1 mixture of acetone-5% NaOH (5 mL) was stirred at rt under O_2 for 24 h. The mixture was concentrated, H_2O (5 mL) was added and the orange precipitate was collected by filtration to give **13**: 20 mg (98%); mp 231-3°C (Lit³: 234-5°C); ^1H NMR (300 MHz, assignment aided by HSQC and HMBC) δ 3.45 (s, 3H, OMe), 6.18 (s, 2H, NCH_2), 7.47 (ddd, $J = 1.2, 6.9, 7.8$ Hz, 1H, 9-H), 7.55 (ddd, $J = 1.2, 7.2, 8.4$ Hz, 1H, 10-H), 7.67 (dt, $J = 0.9, 0.9, 8.4$ Hz, 1H, 11-H), 7.79 (ddd, $J = 1.5, 6.9, 8.4$ Hz, 1H, 2-H), 7.87 (ddd, $J = 1.5, 6.6, 8.1$ Hz, 1H, 3-H), 8.22 (d, $J = 8.4$ Hz, 1H, 4-H), 8.47 (d, $J = 7.5$ Hz, 1H, 8-H), 9.61 (d, $J = 8.4$ Hz, 1H, 1-H), 9.81 (s, 1H, 6-H); ^{13}C NMR (100.6 MHz, assignment aided by HSQC and HMBC) δ 56.7 (OMe), 75.5 (NCH_2), 111.9 (C-11), 123.2 (C-13b), 123.3 (C-7b), 123.9 (C-8), 124.4 (C-6a), 125.4 (C-9), 127.7 (C-1), 128.3 (C-10), 130.2 (C-2), 130.4 (C-4), 131.5 (C-3), 133.4 (C-13a), 135.6 (C-12a), 140.4 (C-11a), 147.8 (C-6), 152.3 (C-4a), 181.4 (C-13), 182.2 (C-7), C-7a, not observed; HRMS (ESI) calcd for $\text{C}_{21}\text{H}_{15}\text{N}_2\text{O}_3$ 343.1077 ($\text{M}+1$), found 343.1080. Anal. Calcd for $\text{C}_{21}\text{H}_{14}\text{N}_2\text{O}_3 \cdot \text{H}_2\text{O}$: C, 69.99; H, 4.47; N, 7.77. Found: C, 69.92; H, 4.09; N, 7.82.

Radical Cyclization of Selenoester 9 under AIBN-Sun Lamp Conditions. AIBN (66 mg, 0.40 mmol) was added in eight portions (0.05 mmol every 1.5 h) to a heated (reflux) solution of selenoester **9** (48 mg, 0.10 mmol) in C_6H_6 (5 mL) under sun-lamp irradiation (300 W). After 12 h, the solvent was removed and the resulting residue was treated with a 0.5 M solution of KOH in MeOH (3 mL) at rt for 8h. The solvent was removed and the resulting residue was partitioned between CH_2Cl_2 and H_2O , and extracted with CH_2Cl_2 . The organic extracts were dried and concentrated, and the resulting residue was chromatographed (8:2 hexanes-AcOEt) to give **12**: 17 mg (50%).

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