Supporting Information

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Reactions were generally performed under argon in flame-dried flasks, and the components were added by syringe. Products were purified by flash chromatography on silica gel (230–400 mesh, Merck or Macherey & Nagel). Unless otherwise stated, yields refer to analytically pure samples. Microwave-assisted reactions were done in a microwave oven “micro Chemist” from MLS GmbH. $^1$H NMR [CHCl$_3$ ($\delta$ = 7.26 ppm), TMS ($\delta$ = 0.00 ppm) as internal standard] and $^{13}$C NMR spectra [CDCl$_3$ ($\delta$ = 77.0 ppm) as internal standard] were recorded with Bruker AC 250, DRX 500, AV 700 or Jeol ECX 400 and Eclipse 500 instruments in CDCl$_3$ solutions. Integrals are in accordance with assignments; coupling constants are given in Hz. IR spectra were measured with an FTIR spectrometer Nicolet 5 SXC FTIR or a Nicolet Smart DuraSampIR ATR spectrometer. MS and HRMS analyses were performed with Finnigan MAT 711 (EI, 80 eV, 8 kV), MAT 95 (EI, 70 eV), MAT CH7A (EI, 80 eV, 3 kV) or Agilent ESI-TOF 6210 (4 μL/min, 1 bar, 4000 V) instruments. Optical rotations ([α]$_D$) were measured with a Perkin Elmer 241 polarimeter in a 1 mL microcuvette at the temperature given. The elemental analyses were recorded with “Elemental-Analyzers” (Perkin–Elmer or Carlo Erba).
(E)-4-Bromo-N-(1-cyclopropyl-2-methoxy-3-oxobut-1-en-1-yl)benzamide (3c)

To a solution of methoxyallene (0.830 g, 1.20 mL, 11.9 mmol) in dry Et₂O (50 mL) was added n-BuLi (4.8 mL, 11.9 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and cyclopropanecarbonitrile (0.399 g, 0.44 mL, 5.90 mmol) in dry Et₂O (10 mL) was added to the reaction mixture. After stirring for 3 h at the same temperature, a solution of 4-bromobenzoic acid (7.17 g, 35.0 mmol) in dry DMF (60 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (50 mL) solution and the product was extracted with CH₂Cl₂ (3 × 50 mL). The combined organic layers were washed with brine (50 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 10:1) to obtain enamide 3c as pale yellow solid (1.29 g, 64%).

M.p. 90–93 °C
IR (ATR): 3270 (N–H), 3040–2840 (=C–H, C–H), 1690 cm⁻¹ (C=O).
₁H NMR (CDCl₃, 400 MHz): δ = 0.85–0.93, 1.05–1.10 (2 m, 2 H each, CH₂), 2.28–2.33 (m, 4 H, CH, Me), 3.70 (s, 3 H, OMe), 7.58–7.63, 7.82–7.86 (2 m, 2 H each, Aryl), 12.5 (s, 1 H, NH).
¹³C NMR (CDCl₃, 125.8 MHz): δ = 10.1 (t, CH₂), 11.2 (d, CH), 26.8 (q, Me), 59.2 (q, OMe), 124.5, 129.9, 131.3, 131.7 (s, d, s, d, Aryl), 135.0, 149.5 (2 s, C=C), 168.9 (s, CON), 200.1 (s, C=O).
Anal. calcd. for C₁₅H₁₅BrNO₃ (338.2): C 53.27, H 4.14, N 4.77; found: C 53.32, H 4.12, N 4.70.

(E)-N-(4-Methoxy-2,2-dimethyl-5-oxohex-3-en-3-yl)-3-(trimethylsilyl)propanamide (3d)

To a solution of methoxyallene (0.315 g, 0.34 mL, 4.50 mmol) in dry Et₂O (5 mL) was added n-BuLi (1.5 mL, 3.75 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and trimethylacetonitrile (0.208 g, 0.27 mL, 2.50 mmol) in dry Et₂O (2 mL) was added to the reaction mixture. After stirring for 4 h at the same temperature, a solution of 3-(trimethylsilyl)propionic acid (1.16 g, 7.90 mmol) in dry Et₂O (3 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (20 mL) solution and the product was extracted with Et₂O (3 × 25 mL). The combined organic layers were washed with brine (20 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 4:1) to obtain enamide 3d as pale yellow oil (0.273 g, 40%).
IR (ATR): 3250 (N–H), 2990–2840 (=C–H, C–H), 1680 cm⁻¹ (C=O).
(E)-N-(4-Methoxy-2,2-dimethyl-5-oxohex-3-en-3-yl)pivalamide (3g)
To a solution of methoxyallene (1.20 mL, 11.9 mmol) in dry Et₂O (50 mL) was added n-BuLi (4.8 mL, 11.09 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and trimethylacetonitrile (0.500 g, 0.67 mL, 6.00 mmol) in dry Et₂O (20 mL) was added to the reaction mixture. After stirring for 3 h at the same temperature, a solution of pivalic acid (3.60 g, 35.2 mmol) in dry Et₂O (40 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (50 mL) solution and the product was extracted with Et₂O (3×50 mL). The combined organic layers were washed with brine (50 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 6:1) to obtain enamide 3g as pale yellow oil (1.05 g, 69%).

IR (ATR): 3230 (N–H), 2930–2860 (=C–H, C–H), 1675 cm⁻¹ (C=O).

¹H NMR (CDCl₃, 400 MHz): δ = 1.19, 1.22 (2 s, 9 H each, tBu), 2.25 (s, 3 H, Me), 3.51 (s, 3 H, OMe), 7.30 (br s, 1 H, NH).
¹³C NMR (CDCl₃, 100.5 MHz): δ = 27.0 (q, Me), 27.2, 28.4, 36.6, 39.1 (2 q, 2 s, tBu), 59.1 (q, OMe), 134.8, 149.9 (2 s, C=C), 178.1 (s, CON), 200.5 (s, C=O).
HRMS (ESI-ToF): m/z calcd for C₁₄H₂₅NNaO₃ [M + Na]⁺ 278.1727; found: 278.1747.

(E)-2-Chloro-N-(4-methoxy-2,2-dimethyl-5-oxohex-3-en-3-yl)acetamide (3h)
To a solution of methoxyallene (2.20 g, 31.4 mmol) in dry Et₂O (50 mL) was added n-BuLi (12.5 mL, 31.4 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and trimethylacetonitrile (3.55 g, 4.7 mL, 42.8 mmol) in dry Et₂O (7 mL) was added to the reaction mixture. After stirring for 4 h at the same temperature, a solution of chloroacetic acid (8.08 g, 85.5 mmol) in dry Et₂O (10 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (50 mL) solution and the product was extracted with Et₂O (3 × 50 mL). The combined organic layers were washed with brine (50 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 4:1 to 1:1) to obtain enamide 3h as pale yellow solid (4.60 g, 59%).
M.p. 97–100 °C
IR (ATR): 3240 (N–H), 2995–2835 (=C–H, C–H), 1685 cm$^{-1}$ (C=O).
$^1$H NMR (CDCl$_3$, 400 MHz): $\delta = 1.18$ (s, 9 H, tBu), 2.24 (s, 3 H, Me), 3.50 (s, 3 H, OMe), 3.99 (s, 2 H, CH$_2$Cl), 7.60 (br s, 1 H, NH).
$^{13}$C NMR (CDCl$_3$, 125.8 MHz): $\delta = 27.3$ (q, Me), $28.3$, $36.4$ (q, s, tBu), 43.0 (t, CH$_2$Cl), 59.0 (q, OMe), 130.7, 150.8 (2 s, C=C), 164.9 (s, CON), 200.2 (s, C=O).
HRMS (ESI-ToF): $m/z$ calcd for C$_{11}$H$_{18}$ClNNaO$_3$ [M + Na]$^+$ 270.0852; found: 270.0869.
Anal. calcd. for C$_{11}$H$_{18}$ClNO$_3$ (247.7): C 53.33, H 7.32, N 5.65; found: C 53.82, H 7.32, N 5.68.

**(E)-N-(4-(Benzyloxy)-2,2-dimethyl-5-oxohex-3-en-3-yl)cyclopropanecarboxamide (3m)**
To a solution of methoxyallene (0.470 g, 0.55 mL, 6.70 mmol) in dry Et$_2$O (15 mL) was added n-BuLi (2.45 mL, 6.10 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and trimethylacetonitrile (0.835 g, 10.0 mmol) in dry Et$_2$O (5 mL) was added to the reaction mixture. After stirring for 4 h at the same temperature, a solution of cyclopropanecarboxylic acid (1.72 g, 20.0 mmol) in dry Et$_2$O (15 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO$_3$ (20 mL) solution and the product was extracted with Et$_2$O (3 × 50 mL). The combined organic layers were washed with brine (25 mL) and finally dried with Na$_2$SO$_4$. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO$_2$, hexanes/EtOAc = 1:1) to obtain enamide 3m as pale yellow oil (1.40 g, 66%).
IR (ATR): 3250 (N–H), 3080–2875 (=C–H, C–H), 1675 cm$^{-1}$ (C=O).
$^1$H NMR (CDCl$_3$, 400 MHz): $\delta = 0.72–0.79, 0.90–0.98$ (2 m, 2 H each, cPr), 1.24 (s, 9 H, tBu), 1.39–1.48 (m, 1 H, cPr), 2.24 (s, 3 H, Me), 4.65 (s, 2 H, OCH$_2$), 6.92 (br s, 1 H, NH), 7.30–7.45 (m, 5 H, Ph).
$^{13}$C NMR (CDCl$_3$, 100.5 MHz): $\delta = 7.7$ (t, CH$_2$), 14.3 (d, CH), 27.8 (q, Me), 28.4, 36.6 (q, s, tBu), 73.0 (t, OCH$_2$), 126.9, 128.2, 128.5, 136.1 (3 d, s, Ph), 133.6, 149.9 (2 s, C=C), 168.7 (s, CON), 199.9 (s, C=O).
HRMS (ESI-ToF): $m/z$ calcd for C$_{19}$H$_{25}$NNaO$_3$ [M + Na]$^+$ 338.1727; found: 338.1734.

**(E)-N-(2,2-Dimethyl-5-o xo-4-(2-(trimethylsilyl)ethoxy)hex-3-en-3-yl) benzamide (3p)**
To a solution of (2-trimethylsilyloxy)propadiene (4.45 g, 28.5 mmol) in dry Et$_2$O (57 mL) was added n-BuLi (12.5 mL, 31.4 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and trimethylacetonitrile (3.55 g, 4.7 mL, 42.8 mmol) in dry Et$_2$O (30 mL) was added to the reaction mixture. After stirring for 4 h at the same temperature, a solution of benzoic acid (10.4 g, 85.5 mmol) in dry Et$_2$O (30 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and
the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (50 mL) solution and the product was extracted with Et₂O (3×100 mL). The combined organic layers were washed with brine (50 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 6:1) to obtain enamide 3p as pale yellow solid (4.99 g, 30%).

M.p. 117–119 °C
IR (ATR): 3290 (N–H), 3040–2898 (=C–H, C–H), 1645 cm⁻¹ (C=O).
¹H NMR (CDCl₃, 400 MHz): δ = 0.02 (s, 9 H, SiMe₃), 1.09–1.14 (m, 2 H, CH₂Si), 1.28 (s, 9 H, tBu), 2.25 (s, 3 H, Me), 3.60–3.68 (m, 2 H, OCH₂), 7.38–7.49, 7.74–7.76 (2 m, 3 H, 2 H, Ph), 7.67 (br s, 1 H, NH).
¹³C NMR (CDCl₃, 100.5 MHz): δ = -1.5 (q, SiMe₃), 18.7 (t, CH₂Si), 27.6 (q, Me), 28.6, 36.6 (q, s, tBu), 69.6 (t, OCH₂), 127.0, 128.6, 131.7, 133.8 (3 d, s, Ph), 134.4, 149.8 (2 s, C=C), 167.4 (s, CON), 201.3 (s, C=O).
Anal. calcd. for C₂₀H₃₁NO₂Si (361.6): C 66.44, H 8.64, N 3.87; found: C 66.67, H 8.52, N 4.20.

(S)-N,N-Dibenzyl-1-(propa-1,2-dienyloxy)propane-2-amine (6)
To a solution of (S)-alaninol 5 (5.48 g, 21.5 mmol) dissolved in THF (35 mL) was added NaH (0.950 g, 23.7 mmol; 60% in mineral oil) at 0 °C. The resulting suspension was heated to reflux for 1.5 h. After cooling to 0 °C, n-Bu₄NI (0.153 g, 0.415 mmol) and propargyl bromide (2.60 mL, 22.9 mmol) dissolved in THF (35 mL) were slowly added and the mixture was stirred for 3.5 h at rt. Then, 1 M HCl solution (30 mL) was added and washed with EtOAc (1 × 40 mL). The aqueous solution was adjusted to pH >10 using 1M NaOH solution and extracted with EtOAc (3 × 40 mL). The combined organic layers were dried with Na₂SO₄, filtered and concentrated. Column chromatography (alumina neutral, hexanes/EtOAc, 4:1) provided (S)-N,N-dibenzyl-1-(prop-2-ynyloxy)propane-2-amine (4.07 g, 64%) as yellow oil.

[α]D²² –37.6 (c 0.75, CHCl₃).
IR (ATR): 3290 (C=CH), 3090–2795 (=CH, C–H), 2115 cm⁻¹ (C≡C).
¹H NMR (CDCl₃, 250 MHz): δ = 1.08 (d, J = 7 Hz, 3 H, Me), 2.39 (t, J = 2.5 Hz, 1 H, ≡CH), 3.04 (sext, J = 6.4 Hz, 1 H, NCH), 3.45–3.76 (m, 6 H, OCH₂, NCH₂), 4.09 (d, J = 2.5 Hz, 2 H, CH₂), 7.07–7.20 (m,10 H, Ph).
¹³C NMR (CDCl₃, 100.5 MHz): δ = 12.2 (q, Me), 52.0 (d, NCH), 54.13, 54.21 (2 t, NCH₂), 58.1, 72.6 (2 t, OCH₂), 74.2 (s, ≡C), 80.0 (d, ≡CH), 126.6, 128.1, 128.5, 140.6 (3 d, s, Ph).
Anal. calcd. for C₂₀H₂₃NO (293.4): C 81.87, H 8.64, N 3.87; found: C 81.65, H 8.29, N 5.27.

(S)-N,N-Dibenzyl-1-(prop-2-ynyloxy)propane-2-amine (3.98 g, 13.6 mmol) was dissolved in tert-butanol (35 mL) and KOtBu (1.53 g, 13.6 mmol) was slowly added and the mixture was
heated to reflux for 2 h. After cooling to rt, water (30 mL) and Et₂O (30 mL) were added to the mixture. The aqueous solution was extracted with EtOAc (3 × 30 mL). The combined organic layers were dried with Na₂SO₄, filtered and concentrated to provide allene 6 (3.73 g, 94%) as brownish oil.

\[ \alpha_d \] -45.1 (c 0.75, CHCl₃).

IR (ATR): 3090–2800 (=CH, C–H), 1950 cm⁻¹ (C=C=C).

\(^1\)H NMR (CDCl₃, 250 MHz): \( \delta = 1.08 \) (d, \( J = 7 \) Hz, 3 H, Me), 3.10 (sept, \( J = 7 \) Hz, 1 H, CHN), 3.48 (dd, \( J = 6.4, 10.2 \) Hz, 1 H, CH₂O), 3.57, 3.72 (AB system, \( J_{AB} = 14 \) Hz, 2 H each, CH₂N), 3.71 (dd, \( J = 6.4, 10.2 \) Hz, 1 H, CH₂O), 5.26–5.43 (m, 2 H, =CH₂), 6.72 (t, \( J = 6.4 \) Hz, 1 H, =CH), 7.15–7.45 (m, 10 H, Ph).

\(^13\)C NMR (CDCl₃, 100.5 MHz): \( \delta = 12.2 \) (q, Me), 51.9 (d, CHN), 54.3 (t, CH₂N), 71.3 (t, OCH₂), 91.0 (t, =CH₂), 122.0 (d, =CH), 126.9, 128.3, 128.8, 140.7 (3 d, s, Ph), 201.4 (s, =C=).

Anal. calcd. for C₂₀H₂₃NO (293.4): C 81.87, H 7.90, N 4.77; found: C 81.70, H 7.34, N 5.28.

(S,E)-N-(4-(2-(Dibenzylamino)propoxy)-2,2-dimethyl-5-oxohex-3-en-3-yl)acetamide (3r)

Allene 6 (2.69 g, 9.04 mmol) was dissolved in diethyl ether (50 mL) was added at –40 °C followed by the addition of n-butyllithium (3.32 g, 8.29 mmol, 2.5 M in hexanes). After 25 min at –50 °C to –40 °C pivalonitrile (0.626 g, 7.54 mmol) was added. The solution was stirred at –40 °C for 30 min and then cooled to –78 °C. After stirring for 4 h at this temperature acetic acid (1.63 g, 27.1 mmol) was added and the mixture was warmed up overnight to rt. The mixture was quenched with satd. aq. NaHCO₃ solution (20 mL) and extracted with CH₂Cl₂ (3 × 20 mL). The combined organic layers were dried with Na₂SO₄, filtered and concentrated. Column chromatography (silica gel, hexanes/EtOAc, 4:1) provided the recovered starting material 6 (1.29 g, 49%) and the β-ketoenamide 3r (0.861 g, 26%) as yellow resin.

\[ \alpha_d \] -15.8 (c 0.83, CHCl₃).

IR (ATR): 3265 (N–H), 3090–2795 (=C–H, C–H), 1685, 1660 cm⁻¹ (C=O).

\(^1\)H NMR (CDCl₃, 400 MHz): \( \delta = 1.14 \) (s, 9 H, tBu), 1.17 (d, \( J = 6.7 \) Hz, 3 H, Me), 1.97, 2.14 (2 s, 3 H each, Me), 3.12-3.21 (m, 1 H, CHN), 3.43 (dd, \( J = 8.1, 9 \) Hz, 1 H, OCH₂), 3.57 (d, \( J = 13.9 \) Hz, 2 H, CH₂Ph), 3.65 (dd, \( J = 5.6, 9 \) Hz, 1 H, OCH₂), 3.71 (d, \( J = 13.9 \) Hz, 2 H, CH₂Ph), 6.66 (br s, 1 H, NH), 7.18-7.30, 7.33-7.39 (2 m, 6 H, 4 H, Ph).

\(^13\)C NMR (CDCl₃, 100.5 MHz): \( \delta = 11.6 \) (q, Me), 23.3, 27.4 (2 q, Me), 28.4, 36.1 (q, s, tBu), 52.4 (t, CHN), 54.0 (t, CH₂Ph), 73.9 (t, OCH₂), 126.8, 128.2, 128.3, 139.8 (3 d, s, Ph), 131.7, 150.3 (2 s, C=C), 169.9 (s, CONH), 201.3 (s, C=O).

HRMS (ESI-ToF): \( m/z \) calcd for C₂₇H₂₇N₂O₃[M + H]⁺: 437.2804; found 437.2807.
(S,E)-N-(3-Methoxy-5-methyl-2-oxohept-3-en-4-yl)cyclopropanecarboxamide (3t)

To a solution of methoxyallene (0.885 g, 1.05 mL, 12.6 mmol) in dry Et₂O (15 mL) was added n-BuLi (4.5 mL, 11.3 mmol, 2.5 M in hexanes) at –50 °C. After 30 min stirring at –50 °C, the reaction mixture was cooled to –78 °C and (S)-2-methylbutyronitrile (0.350 g, 4.20 mmol) in dry Et₂O (5 mL) was added to the reaction mixture. After stirring for 4 h at the same temperature, a solution of cyclopropanecarboxylic acid (1.08 g, 12.6 mmol) in dry Et₂O (10 mL) was added to the reaction mixture. The temperature was allowed to increase up to room temperature and the reaction mixture was stirred overnight. The reaction was quenched with sat. aq. NaHCO₃ (10 mL) solution and the product was extracted with Et₂O (2×50 mL). The combined organic layers were washed with brine (20 mL) and finally dried with Na₂SO₄. Solvent was removed in a rotary evaporator and the crude product was purified by column chromatography (SiO₂, hexanes/EtOAc = 1:1) to obtain enamide 3t as pale yellow resin (0.211 g, 21%).

[α]D²² +2.9 (c 1.00, CHCl₃).

IR (ATR): 3280 (N–H), 2980–2780 (=C–H, C–H), 1690 cm⁻¹ (C=O).

¹H NMR (CDCl₃, 400 MHz): δ = 0.81–0.88 (m, 2 H, CH₂), 0.91 (t, J = 7 Hz, 3 H, Me), 0.95–1.06 (m, 2 H, CH₂), 1.28 (d, J = 6.9 Hz, 3 H, Me), 1.56–1.76 (m, 4 H, CH, CH₂, CHMe), 2.31 (s, 3 H, Me), 3.57 (s, 3 H, OMe), 6.65 (br s, 1 H, NH).

¹³C NMR (CDCl₃, 125.8 MHz): δ = 8.6, 12.8, 13.6 (3 t, CH₂), 17.0, 17.3 (2 d, CH), 26.7 (q, Me), 27.2 (q, Me), 34.8 (q, MeCH), 61.9 (q, OMe), 139.5, 152.1 (2 s, C=C), 172.6 (s, CONH), 201.3 (s, C=O).

HRMS (ESI-ToF): m/z calcd for C₁₃H₂₂N₂O₂ [M + H]⁺ 237.1598; found: 237.1591.
Compound 3h
Compound 3p

Chemical structure diagram
Compound 8b
Compound 4d
Compound 4g
Compound 4h
Compound 4i
Compound 4j
Compound 4n
Compound 4ο
Compound 4t
Compound 4u

![Compound Structure]

- Compound 4u is depicted with a specific chemical structure.
- The spectrum shows various peaks and chemical shifts.
- The spectrum ranges from 0 to 160 ppm on the x-axis and from 0 to 10 on the y-axis.

- Key chemical shifts are noted:
  - 29.05 ppm
  - 30.82 ppm
  - 38.32 ppm
  - 63.46 ppm
  - 117.52 ppm
  - 119.73 ppm
  - 127.12 ppm
  - 128.70 ppm
  - 128.88 ppm
  - 135.05 ppm
  - 153.93 ppm
  - 155.19 ppm
  - 156.90 ppm

These values correspond to specific chemical groups and functional groups within the compound.
Compound 10c
Compound 10d
Compound 11d
Compound 10e
Compound 10g
Compound 11g

[Chemical structure image]

[Graphical representation of NMR spectrum]
Compound 10n
Compound 12a
Compound 12b
Compound 12c
Compound 12d