Electronic Supplementary Information

Organoselenium-Catalyzed N\textsuperscript{1}- and N\textsuperscript{2}-selective aza-Wacker reaction of alkenes with benzotriazoles

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I. General remarks.

All reagents were purchased from commercial sources and used without further purification. $^1$H NMR and $^{13}$C NMR spectra were recorded on a Bruker Ascend™ 400 spectrometer in deuterated solvents containing TMS as an internal reference standard. High-resolution mass spectrometry (HRMS) analyses were conducted on a Waters LCT Premier/XE. Melting points were measured on a melting point apparatus equipped with a thermometer and were uncorrected. All the reactions were conducted in oil bath and monitored by thin-layer chromatography (TLC) using GF254 silica gel-coated TLC plates. Purification by flash column chromatography was performed over SiO$_2$ (silica gel 200–300 mesh).

II. GC-MS study

To a reaction tube equipped with a stir bar, styrene 1a (0.5 mmol, 52.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg) were added. The reaction mixture was stirred in DME (2.0 mL) at 120 °C for 1.5 h. And then take 2 μL reaction liquid for GC-MS analysis. After scanned for 8.202 min, the signal 260.1, which is more like a mass fragment from intermediate 6.
III. General procedure:

General procedure for compounds 3:
To a reaction tube equipped with a stir bar, alkenes 1 (0.5 mmol), benzotriazoles 2 (0.5 mmol), (PhSe)$_2$ (5% mol), and selectfluor (0.6 mmol) were added sequentially. Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3.

General procedure for compounds 4:
To a reaction tube equipped with a stir bar, alkenes 1 (0.5 mmol), benzotriazoles 2 (0.5 mmol), (PhSe)$_2$ (5% mol), Me$_3$SiH (0.5 mmol, 37.1 mg), and K$_2$S$_2$O$_8$ (0.6 mmol) were added sequentially. Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4.

General procedure for compounds 5, 6, 7 and 8, please see references 1-4.

IV. Analytical data of products obtained in this study
1-(1-phenylvinyl)-1H-benzo[d][1,2,3]triazole (3a).
styrene 1a (0.5 mmol, 52.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were...
dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3a as pale yellow liquid (79%, 87.4 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.79$ (d, $J = 0.8$, 1H), 5.81 (s, 1H), 7.07 (d, $J = 6.0$, 1H), 7.30 (d, $J = 7.2$, 2H), 7.37-7.44 (m, 5H), 8.12 (t, $J = 2.0$, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 111.1$, 111.2, 120.1, 124.2, 126.9, 127.8, 128.8, 129.8, 132.9, 134.6, 142.6, 146.1. HRMS (ESI-TOF) Calcd for C$_{14}$H$_{12}$N$_3$, [M+H]$^+$ 222.1031; Found 222.1038.

1-(1-(2-fluorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3b).

1-fluoro-2-vinylbenzene 1b (0.5 mmol, 61.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3b as pale yellow liquid (73%, 87.3 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.82$ (s, 1H), 6.01 (s, 1H), 7.12-7.20 (m, 3H), 7.25 (d, $J = 7.2$, 1H), 7.37-7.43 (m, 3H), 8.10 (s, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 110.6$, 113.6 (d, $J = 4.3$ Hz), 116.5 (d, $J = 21.6$ Hz), 120.2, 124.2, 124.5, 127.9, 130.1 (d, $J = 2.2$ Hz), 131.4, 132.5, 137.4, 146.1, 158.9, 161.4 (d, $J = 252.3$ Hz). HRMS (ESI-TOF) Calcd for C$_{14}$H$_{11}$FN$_3$, [M+H]$^+$ 240.0937; Found 240.0940.

1-(1-(4-fluorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3c).

1-fluoro-4-vinylbenzene 1c (0.5 mmol, 61.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and...
quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3c as pale yellow liquid (75%, 89.7 mg).

**1H NMR (400 MHz; CDCl₃):** δ = 5.76 (s, 2H), 7.07-7.13 (m, 3H), 7.30 (q, J = 5.2, 2H), 7.39-7.42 (m, 2H), 8.12 (d, J = 6.8, 1H). **13C NMR (100 MHz; CDCl₃):** δ = 110.8, 111.0, 115.8, 116.0, 120.4, 124.3, 127.9, 128.9 (d, J = 8.3 Hz), 130.8 (d, J = 3.3 Hz), 132.8, 141.7, 146.1, 162.3 (d, J = 250.3 Hz), 164.8. HRMS (ESI-TOF) Calcd for C₁₄H₁₁FN₃, [M+H]+ 240.0937; Found 240.0933.

**1-(1-(2-chlorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3d).**

1-chloro-2-vinylbenzene 1d (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3d as white solid (76%, 97.1 mg), melting point: 68-69 °C.

**1H NMR (400 MHz; CDCl₃):** δ = 5.59 (s, 1H), 6.08 (s, 1H), 7.08 (d, J = 6.8, 1H), 7.37-7.41 (m, 5H), 7.55 (dd, J₁ = 1.2, J₂ = 6.0, 1H), 8.09 (d, J = 2.0, 1H). **13C NMR (100 MHz; CDCl₃):** δ = 110.7, 111.7, 120.2, 124.2, 127.2, 128.0, 130.3, 130.9, 131.6, 132.2, 133.4, 134.1, 140.7, 146.2. HRMS (ESI-TOF) Calcd for C₁₄H₁₁ClN₃, [M+H]+ 256.0642; Found 256.0638.

**1-(1-(3-chlorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3e).**

1-chloro-3-vinylbenzene 1e (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3e as white solid (76%, 97.1 mg), melting point: 68-69 °C.

**1H NMR (400 MHz; CDCl₃):** δ = 5.59 (s, 1H), 6.08 (s, 1H), 7.08 (d, J = 6.8, 1H), 7.37-7.41 (m, 5H), 7.55 (dd, J₁ = 1.2, J₂ = 6.0, 1H), 8.09 (d, J = 2.0, 1H). **13C NMR (100 MHz; CDCl₃):** δ = 110.7, 111.7, 120.2, 124.2, 127.2, 128.0, 130.3, 130.9, 131.6, 132.2, 133.4, 134.1, 140.7, 146.2. HRMS (ESI-TOF) Calcd for C₁₄H₁₁ClN₃, [M+H]+ 256.0642; Found 256.0638.
reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3e as pale yellow liquid (74%, 94.6 mg).

**1H NMR (400 MHz; CDCl₃):** δ = 5.81 (s, 1H), 5.84 (s, 1H), 7.15 (d, J = 8.0, 2H), 7.32-7.43 (m, 5H), 8.13 (t, J = 1.2, 1H).

**13C NMR (100 MHz; CDCl₃):** δ = 110.9, 112.1, 120.2, 124.3, 125.1, 127.0, 128.1, 129.8, 130.1, 132.8, 134.9, 136.5, 141.4, 146.1. HRMS (ESI-TOF) Calcd for C₁₄H₁₁ClN₃, [M+H]+ 256.0642; Found 256.0647.

**1-(1-(4-chlorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3f).**

1-chloro-4-vinylbenzene 1f (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3f as white solid (78%, 99.7 mg), melting point: 57-58 °C.

**1H NMR (400 MHz; CDCl₃):** δ = 5.80 (s, 1H), 5.81 (s, 1H), 7.13 (d, J = 6.8, 1H), 7.24 (d, J = 8.4, 2H), 7.33-7.42 (m, 4H), 8.13 (d, J = 2.0, 1H).

**13C NMR (100 MHz; CDCl₃):** δ = 111.0, 111.4, 120.2, 124.3, 128.0, 128.2, 129.1, 132.7, 133.1, 135.8, 141.6, 146.1. HRMS (ESI-TOF) Calcd for C₁₄H₁₁ClN₃, [M+H]+ 256.0642; Found 256.0639.

**1-(1-(2-bromophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3g).**

1-bromo-2-vinylbenzene 1g (0.5 mmol, 91.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the
reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product **3g** as white solid (75%, 112.6 mg), melting point: 67-68 °C.

1H NMR (400 MHz; CDCl₃): δ = 5.55 (d, J = 0.8, 1H), 6.08 (d, J = 0.8, 1H), 7.05 (d, J = 6.8, 1H), 7.34-7.38 (m, 3H), 7.46 (q, J = 6.4, 1H), 7.57-7.62 (m, 2H), 8.09 (dd, J₁ = 2.8, J₂ = 6.8, 1H). 13C NMR (100 MHz; CDCl₃): δ = 110.8, 111.2, 120.2, 122.9, 124.2, 127.8, 128.0, 131.1, 131.9, 132.2, 133.5, 136.0, 142.0, 146.3. HRMS (ESI-TOF) Calcd for C₁₄H₁₁BrN₃, [M+H]⁺ 300.0137; Found 300.0142.

**1-(1-(3-bromophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3h).**

1-bromo-3-vinylbenzene **1h** (0.5 mmol, 91.5 mg), benzotriazole **2a** (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product **3h** as pale yellow liquid (72%, 108.1 mg).

1H NMR (400 MHz; CDCl₃): δ = 5.82 (s, 1H), 5.84 (s, 1H), 7.14 (d, J = 8.0, 2H), 7.19 (d, J = 8.4, 1H), 7.24-7.28 (m, 2H), 7.39-7.46 (m, 2H), 7.56 (d, J = 8.0, 1H). 13C NMR (100 MHz; CDCl₃): δ = 110.9, 112.1, 120.3, 124.4, 125.5, 128.1, 129.9, 130.3, 132.8, 136.7, 141.3, 146.1. HRMS (ESI-TOF) Calcd for C₁₄H₁₁BrN₃, [M+H]⁺ 300.0137; Found 300.0148.

**1-(1-(4-bromophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3i).**

1-bromo-4-vinylbenzene **1i** (0.5 mmol, 91.5 mg), benzotriazole **2a** (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the
reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3i as white solid (80%, 120.1 mg), melting point: 57-58 °C.

1H NMR (400 MHz; CDCl₃): δ = 5.80 (d, J = 1.2, 1H), 5.82 (d, J = 0.8, 1H), 7.11-7.13 (m, 1H), 7.17 (dd, J₁ = 1.6, J₂ = 6.8, 2H), 7.40 (dd, J₁ = 1.6, J₂ = 4.8, 2H), 7.43 (d, J = 1.6, 2H), 7.53 (t, J = 6.4, 1H) ¹³C NMR (100 MHz; CDCl₃): δ = 110.9, 111.4, 120.2, 124.1, 124.3, 128.0, 128.4, 132.0, 132.8, 133.6, 141.7, 146.1. HRMS (ESI-TOF) Calcd for C₁₄H₁₁BrN₃, [M+H]⁺ 300.0137; Found 300.0141.

1-(1-(4-(trifluoromethyl)phenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3j).
1-(trifluoromethyl)-4-vinylbenzene 1j (0.5 mmol, 86.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3j as white solid (77%, 111.4 mg), melting point: 83-84 °C.

1H NMR (400 MHz; CDCl₃): δ = 5.89 (s, 1H), 5.92 (s, 1H), 7.13 (d, J = 7.6, 1H), 7.42-7.44 (m, 4H), 7.64 (d, J = 8.4, 2H), 8.13 (d, J = 7.2, 1H). ¹³C NMR (100 MHz; CDCl₃): δ = 110.8, 112.9 (Jₐ,F = 209 Hz), 120.3, 123.8 (d, J = 272.9 Hz), 124.4, 125.8 (q, J = 3.7 Hz), 126.7, 128.2, 131.6 (q, J = 32.7 Hz), 132.7, 138.1, 141.4, 146.1. HRMS (ESI-TOF) Calcd for C₁₅H₁₁F₃N₃, [M+H]⁺ 290.0905; Found 290.0909.

1-(1-(2,6-dichlorophenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3k).
1,3-dichloro-2-vinylbenzene 1k (0.5 mmol, 86.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), \((\text{PhSe})_2\) (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na\(_2\)SO\(_4\) and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3k as white solid (73%, 105.9 mg), melting point: 91-92 °C.

\(^1\)H NMR (400 MHz; CDCl\(_3\)): \(\delta = 5.50\) (s, 1H), 6.26 (s, 1H), 7.24 (d, \(J = 8.4\), 1H), 7.30-7.42 (m, 5H), 8.06 (dd, \(J_1 = 0.8\), \(J_2 = 8.4\), 1H). \(^{13}\)C NMR (100 MHz; CDCl\(_3\)): \(\delta = 110.7, 111.9, 120.3, 124.3, 128.4, 131.0, 131.7, 133.2, 135.8, 136.9, 146.2\). HRMS (ESI-TOF) Calcd for C\(_{14}\)H\(_{10}\)Cl\(_2\)N\(_3\), [M+H]\(^+\) 290.0252; Found 290.0258.

1-(1-([m]-tolyl)vinyl)-1\(^H\)-benzo[\(d\)][1,2,3]triazole (3l).

1-methyl-3-vinylbenzene 1l (0.5 mmol, 59.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), \((\text{PhSe})_2\) (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na\(_2\)SO\(_4\) and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3l as pale yellow liquid (85%, 100.0 mg).

\(^1\)H NMR (400 MHz; CDCl\(_3\)): \(\delta = 2.33\) (s, 3H), 5.75 (s, 1H), 5.78 (s, 1H), 7.07-7.11 (m, 3H), 7.25 (d, \(J = 3.6\), 2H), 7.37 (dd, \(J_1 = 3.2\), \(J_2 = 6.4\), 2H), 8.11 (dd, \(J_1 = 1.2\), \(J_2 = 4.0\), 1H). \(^{13}\)C NMR (100 MHz; CDCl\(_3\)): \(\delta = 21.4, 110.9, 111.3, 120.0, 124.1, 127.5, 127.7, 128.7, 130.6, 132.9, 134.6, 138.6, 142.7, 146.1\). HRMS (ESI-TOF) Calcd for C\(_{15}\)H\(_{14}\)N\(_3\), [M+H]\(^+\) 236.1188; Found 236.1184.

1-(1-([p]-tolyl)vinyl)-1\(^H\)-benzo[\(d\)][1,2,3]triazole (3m).
1-methyl-4-vinylbenzene 1m (0.5 mmol, 59.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)_2 (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3m as pale yellow liquid (83%, 97.6 mg).

_1^H NMR (400 MHz; CDCl_3): δ = 2.40 (s, 3H), 5.73 (s, 1H), 5.76 (s, 1H), 7.08 (d, J = 6.4, 1H), 7.20 (s, 4H), 7.37 (dd, J₁ = 3.2, J₂ = 6.4, 2H), 8.11-8.14 (m, 1H)._1^3C NMR (100 MHz; CDCl_3): δ = 21.3, 110.2, 111.3, 120.1, 124.1, 126.8, 127.6, 129.5, 131.8, 132.9, 139.9, 142.6, 146.1. HRMS (ESI-TOF) Calcd for C_{15}H_{14}N_{3}, [M+H]^+ 236.1188; Found 236.1191.

1-(1-(4-(tert-butyl)phenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3n).

1-(tert-butyl)-4-vinylbenzene 1n (0.5 mmol, 80.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)_2 (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3n as pale yellow liquid (79%, 109.6 mg).

_1^H NMR (400 MHz; CDCl_3): δ = 1.34 (s, 9H), 5.71 (s, 1H), 5.80 (s, 1H), 7.14 (d, J = 6.4, 1H), 7.22 (d, J = 8.4, 2H), 7.37-7.41 (m, 4H), 8.12 (d, J = 2.0, 1H)._1^3C NMR (100 MHz; CDCl_3): δ = 31.2, 34.8, 110.4, 111.2, 120.0, 124.1, 125.7, 126.5, 127.7, 131.7, 133.0, 142.5, 146.0, 153.1. HRMS (ESI-TOF) Calcd for C_{18}H_{20}N_{3}, [M+H]^+ 278.1657; Found 278.1652.

1-(1-(4-(chloromethyl)phenyl)vinyl)-1H-benzo[d][1,2,3]triazole (3o).
1-(chloromethyl)-4-vinylbenzene 1o (0.5 mmol, 76.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3o as pale yellow liquid (76%, 102.5 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta$ = 4.60 (s, 2H), 5.78 (s, 1H), 5.83 (d, $J$ = 0.8, 1H), 7.11-7.13 (m, 1H), 7.28 (d, $J$ = 8.0, 2H), 7.38-7.41 (m, 4H), 8.11 (t, $J$ = 2.0, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta$ = 31.2, 34.8, 110.4, 111.2, 120.0, 124.1, 125.7, 126.5, 127.7, 131.7, 133.0, 142.5, 146.0, 153.1. HRMS (ESI-TOF) Calcd for C$_{15}$H$_{13}$ClN$_3$, [M+H]$^+$ 270.0798; Found 270.0792.

4-(1-(1H-benzo[d][1,2,3]triazol-1-yl)vinyl)phenyl acetate (3p).

4-vinylphenyl acetate 1p (0.5 mmol, 81.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3p as white solid (69%, 96.4 mg), melting point: 95-96 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta$ = 2.30 (s, 3H), 5.75 (s, 1H), 5.79 (s, 1H), 7.11 (d, $J$ = 6.8, 3H), 7.30 (d, $J$ = 8.4, 2H), 7.37-7.39 (m, 2H), 8.09 (t, $J$ = 2.4, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta$ = 21.1, 111.1, 111.3, 120.1, 122.1, 124.3, 128.0, 132.2, 132.8, 141.7, 146.0, 151.7, 169.1. HRMS (ESI-TOF) Calcd for C$_{16}$H$_{14}$N$_3$O$_2$, [M+H]$^+$ 280.1086; Found 280.1082.

1-(1-(cyclohex-1-en-1-yl)vinyl)-1H-benzo[d][1,2,3]triazole (3q).
cyclohexene 1q (0.5 mmol, 41.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3q as pale yellow liquid (72%, 81.1 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta$ = 1.79-1.82 (m, 2H), 1.94-1.97 (m, 2H), 2.36-2.38 (m, 2H), 2.78-2.80 (m, 2H), 6.19-6.21 (m, 1H), 7.40 (m, 1H), 7.47 (t, $J$ = 7.6, 1H), 7.66 (d, $J$ = 8.4, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta$ = 21.6, 22.4, 24.4, 27.6, 111.0, 120.0, 121.3, 124.0, 127.5, 131.9, 135.2, 146.0. HRMS (ESI-TOF) Calcd for C$_{14}$H$_{16}$N$_3$, [M+H]$^+$ 226.1344; Found 226.1347.

(E)-1-(1-(cyclooct-1-en-1-yl)viny1)-1H-benzo[d][1,2,3]triazole (3r).

(Z)-cyclooctene 1r (0.5 mmol, 55.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3r as pale yellow liquid (70%, 88.7 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta$ = 1.68-1.75 (m, 2H), 2.41-2.46 (m, 2H), 2.93-2.93 (m, 2H), 6.11 (t, $J$ = 8.4, 1H), 7.38 (t, $J$ = 7.2, 1H), 7.47-7.51 (m, 1H), 7.65 (d, $J$ = 8.4, 1H), 8.07 (d, $J$ = 8.4, 1H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta$ = 26.0, 26.1, 26.5, 28.5, 29.1, 29.9, 111.0, 120.0, 123.9, 124.2, 127.5, 132.4, 137.4, 145.9. HRMS (ESI-TOF) Calcd for C$_{16}$H$_{20}$N$_3$, [M+H]$^+$ 254.1657; Found 254.1656.

5,6-dimethyl-1-(1-phenylvinyl)-1H-benzo[d][1,2,3]triazole (3s).
styrene 1a (0.5 mmol, 54.0 mg), 5,6-dimethyl-2H-benzo[d][1,2,3]triazole (0.5 mmol, 73.6 mg), (PhSe)_2 (5% mol, 7.8 mg) and selectfluor (0.6 mmol, 212.4 mg). Then the reaction mixture was stirred in DME (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 3s as white solid (79%, 98.5 mg), melting point: 81-82 °C.

^1^H NMR (400 MHz; CDCl_3): δ = 2.30 (s, 3H), 2.40 (s, 3H), 5.73 (s, 1H), 5.78 (s, 1H), 6.86 (s, 1H), 7.29 (d, J = 7.6, 2H), 7.36-7.42 (m, 3H), 7.85 (s, 1H). ^1^C NMR (100 MHz; CDCl_3): δ = 20.3, 20.9, 110.5, 110.7, 114.9, 119.1, 126.8, 128.7, 129.6, 132.0, 134.0, 138.2, 142.7, 145.3. HRMS (ESI-TOF) Calcd for C_16H_16N_3, [M+H]^+ 250.1344; Found 250.1340.

2-(1-phenylvinyl)-2H-benzo[d][1,2,3]triazole (4a).

styrene 1a (0.5 mmol, 52.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)_2 (5% mol, 7.8 mg), Me_3SiH (0.5 mmol, 37.1 mg) and K_2S_2O_8 (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_2SO_4 and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4a as pale yellow liquid (79%, 87.3 mg).

^1^H NMR (400 MHz; CDCl_3): δ = 5.67 (s, 1H), 6.21 (s, 1H), 7.42-7.45 (m, 7H), 7.92 (dd, J_1 = 2.8, J_2 = 6.8, 2H). ^1^C NMR (100 MHz; CDCl_3): δ = 111.0, 118.5, 127.2, 128.4, 129.6, 134.6, 144.7, 147.1. HRMS (ESI-TOF) Calcd for C_14H_12N_3, [M+H]^+ 222.1031; Found 222.1037.

2-(1-(2-fluorophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4b).
1-fluoro-2-vinylbenzene 1b (0.5 mmol, 61.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4b as white solid (74%, 88.5 mg), melting point: 67-68 °C.

$^{1}$H NMR (400 MHz; CDCl$_3$): δ = 5.63 (s, 1H), 6.50 (s, 1H), 7.14 (t, $J = 8.4$, 1H), 7.27 (d, $J = 7.2$, 1H), 7.40 (dd, $J_1 = 3.2$, $J_2 = 6.8$, 2H), 7.47 (t, $J = 7.2$, 2H), 7.88 (d, $J = 6.4$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): δ = 112.6, 115.8, 116.1, 118.5, 124.2, 127.2, 131.1, 131.2 (d, $J = 2.5$ Hz), 131.4 (d, $J = 8.3$ Hz), 131.5, 141.9, 144.7, 159.0, 160.2 (d, $J = 251.4$ Hz), 161.5. HRMS (ESI-TOF) Calcd for C$_{14}$H$_{11}$FN$_3$, [M+H]$^+$ 240.0937; Found 240.0942.

2-(1-(4-fluorophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4c).

1-fluoro-4-vinylbenzene 1c (0.5 mmol, 61.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4c as pale yellow liquid (70%, 83.7 mg).

$^{1}$H NMR (400 MHz; CDCl$_3$): δ = 5.61 (s, 1H), 6.22 (s, 1H), 7.15 (t, $J = 8.4$, 2H), 7.41-7.45 (m, 4H), 7.91 (dd, $J_1 = 2.8$, $J_2 = 6.8$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): δ = 110.8, 115.4 (d, $J = 21.9$ Hz), 115.6, 118.4, 127.4, 130.3 (d, $J = 8.5$ Hz), 130.7 (d, $J = 3.4$ Hz), 144.7, 146.1, 162.2, 163.4 (d, $J = 249.8$ Hz), 164.7. HRMS (ESI-TOF) Calcd
for $\text{C}_{14}\text{H}_{11}\text{FN}_3\text{, [M+H]}^+ \ 240.0937$; Found 240.0941.

2-(1-(2-chlorophenyl)vinyl)-2$^H$-benzo[d][1,2,3]triazole (4d).
1-chloro-2-vinylbenzene 1d (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4d as pale yellow liquid (71%, 90.8 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.52$ (s, 1H), 6.56 (s, 1H), 7.38-7.46 (m, 5H), 7.56 (dd, $J_1 = 2.0$, $J_2 = 6.8$, 1H), 7.87 (d, $J = 3.2$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 111.9, 118.5, 126.9, 127.2, 129.8, 130.8, 131.8, 134.0, 134.1, 144.6, 144.8$. HRMS (ESI-TOF) Calcd for $\text{C}_{14}\text{H}_{11}\text{ClN}_3$, [M+H]$^+$ 256.0642; Found 256.0640.

2-(1-(3-chlorophenyl)vinyl)-2$^H$-benzo[d][1,2,3]triazole (4e).
1-chloro-3-vinylbenzene 1e (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4e as pale yellow liquid (73%, 93.3 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.67$ (s, 1H), 6.26 (s, 1H), 7.34 (q, $J = 7.6$, 2H), 7.43-7.47 (m, 4H), 7.91 (dd, $J_1 = 2.8$, $J_2 = 6.4$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 111.8, 118.5, 124.6, 126.5, 127.4, 128.4, 129.7, 134.4, 136.3, 144.7, 145.8$. HRMS
(ESI-TOF) Calcd for C_{14}H_{11}ClN_{3}, [M+H]^+ 256.0642; Found 256.0649.

2-(1-(4-chlorophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4f).

1-chloro-4-vinylbenzene 1f (0.5 mmol, 69.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4f as white solid (75%, 95.9 mg), melting point: 156-157 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.65$ (s, 1H), 6.24 (s, 1H), 7.39-7.44 (m, 6H), 7.90 (dd, $J_1 = 3.2$, $J_2 = 6.8$, 2H). $^1^3$C NMR (100 MHz; CDCl$_3$): $\delta = 111.2$, 118.4, 127.4, 128.7, 129.6, 133.0, 135.6, 144.7, 146.0. HRMS (ESI-TOF) Calcd for C$_{14}$H$_{11}$ClN$_3$, [M+H]^+ 256.0642; Found 256.0648.

2-(1-(2-bromophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4g).

1-bromo-2-vinylbenzene 1g (0.5 mmol, 91.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4g as pale yellow liquid (68%, 102.1 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.50$ (s, 1H), 5.67 (s, 1H), 7.36-7.44 (m, 6H), 7.90 (dd, $J_1 = 3.2$, $J_2 = 6.8$, 2H). $^1^3$C NMR (100 MHz; CDCl$_3$): $\delta = 111.7$, 118.5, 123.8, 127.3, 127.6, 130.9, 132.1, 133.0, 136.0, 144.8, 145.8.
HRMS (ESI-TOF) Calcd for C_{14}H_{11}BrN_{3}, [M+H]^+ 300.0136; Found 300.0144.

2-(1-(3-bromophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4h).

1-bromo-3-vinylbenzene 1h (0.5 mmol, 91.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)_{2} (5% mol, 7.8 mg), Me_{3}SiH (0.5 mmol, 37.1 mg) and K_{2}S_{2}O_{8} (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_{2}SO_{4} and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4h as white solid (62%, 93.0 mg), melting point: 125-126 °C.

^{1}H NMR (400 MHz; CDCl_{3}): δ = 5.66 (s, 1H), 6.26 (s, 1H), 7.29-7.44 (m, 4H), 7.60 (d, J = 7.6, 2H), 7.90 (s, 2H). ^{13}C NMR (100 MHz; CDCl_{3}): δ = 111.8, 118.5, 122.5, 127.0, 127.4, 129.9, 131.3, 132.5, 136.7, 144.7, 145.7. HRMS (ESI-TOF) Calcd for C_{14}H_{11}BrN_{3}, [M+H]^+ 300.0136; Found 300.0141.

2-(1-(4-bromophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4i).

1-bromo-4-vinylbenzene 1i (0.5 mmol, 91.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)_{2} (5% mol, 7.8 mg), Me_{3}SiH (0.5 mmol, 37.1 mg) and K_{2}S_{2}O_{8} (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na_{2}SO_{4} and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4i as pale yellow liquid (70%, 105.1 mg).

^{1}H NMR (400 MHz; CDCl_{3}): δ = 5.65 (s, 1H), 6.24 (d, J = 0.8, 1H), 7.33 (d, J = 8.4, 2H), 7.43 (dd, J_{1} = 2.8, J_{2} = 6.4, 2H), 7.57 (d, J = 8.8, 2H), 7.89 (dd, J_{1} = 3.2, J_{2} = 6.8, 2H). ^{13}C NMR (100 MHz; CDCl_{3}): δ = 111.2, 118.4, 123.9, 127.4, 129.9, 131.6,
133.5, 144.7, 146.1. HRMS (ESI-TOF) Calcd for C_{14}H_{11}BrN_{3}, [M+H]^+ 300.0136; Found 300.0139.

2-(1-(4-(trifluoromethyl)phenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4j).
1-(trifluoromethyl)-4-vinylbenzene 1j (0.5 mmol, 86.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4j as white solid (72%, 104.1 mg), melting point: 89-90 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.72$ (s, 1H), 6.35 (s, 1H), 7.44 (dd, $J_1 = 3.2, J_2 = 6.8$, 2H), 7.59 (d, $J = 4.4$, 2H), 7.70 (d, $J = 8.0$, 2H), 7.91 (dd, $J_1 = 3.2, J_2 = 6.8$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 111.2, 118.1, 118.4, 123.8$ (d, $J = 272.9$ Hz), 125.4 (q, $J = 3.7$ Hz), 127.5, 127.6, 128.8, 131.4 (q, $J = 32.5$ Hz), 138.0, 144.8, 145.8. HRMS (ESI-TOF) Calcd for C$_{15}$H$_{11}$F$_3$N$_3$, [M+H]$^+$ 290.0905; Found 290.0911.

2-(1-(4-nitrophenyl)vinyl)-2H-benzo[d][1,2,3]triazole (4k).
1-nitro-4-vinylbenzene 1k (0.5 mmol, 74.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4k as white solid (65%, 86.5 mg), melting point: 110-111 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 5.78$ (s, 1H), 6.43 (s, 1H), 7.45 (dd, $J_1 = 3.2, J_2 = 6.8$, 2H), 7.72 (s, 1H), 7.79 (td, $J = 8.4, 2H$), 7.83 (d, $J = 8.4$, 2H), 7.90 (d, $J = 8.4$, 2H), 8.10 (d, $J = 8.4$, 1H), 8.33 (d, $J = 8.4$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 111.3, 118.2, 118.4, 123.7$ (d, $J = 272.9$ Hz), 125.3 (q, $J = 3.7$ Hz), 127.6, 127.7, 128.8, 131.3 (q, $J = 32.5$ Hz), 138.3, 144.9, 145.9. HRMS (ESI-TOF) Calcd for C$_{15}$H$_{11}$F$_3$N$_3$, [M+H]$^+$ 294.0909; Found 294.0913.
2H), 7.65 (d, \( J = 8.8, 2H \)), 7.89 (dd, \( J_1 = 3.2, J_2 = 6.8, 2H \)), 8.30 (d, \( J = 8.8, 2H \)). \(^{13}\)C NMR (100 MHz; CDCl\(_3\)): \( \delta = 113.2, 118.4, 123.7, 127.7, 129.4, 140.6, 144.8, 145.1, 148.3 \). HRMS (ESI-TOF) Calcd for C\(_{14}\)H\(_{11}\)O\(_2\)N\(_4\), [M+H]\(^+\) 267.0882; Found 267.0887.

2-(1-(2,6-dichlorophenyl)vinyl)-2\(H\)-benzo[\(d\)][1,2,3]triazole (4l).

1,3-dichloro-2-vinylbenzene 1l (0.5 mmol, 86.5 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)\(_2\) (5% mol, 7.8 mg), NIS (0.5 mmol, 112.5 mg), Me\(_3\)SiH (0.5 mmol, 37.1 mg) and K\(_2\)S\(_2\)O\(_8\) (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 \( \times \) 3 mL). The combined organic layers were dried over anhydrous Na\(_2\)SO\(_4\) and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4l as white solid (80%, 116.1 mg), melting point: 150-151 °C.

\(^1\)H NMR (400 MHz; CDCl\(_3\)): \( \delta = 5.51 (d, \( J = 0.8, 1H \)), 6.85 (s, 1H), 7.36-7.40 (m, 3H), 7.47 (d, \( J = 7.6, 2H \)), 7.85-7.88 (m, 2H). \(^{13}\)C NMR (100 MHz; CDCl\(_3\)): \( \delta = 112.5, 118.5, 127.3, 128.1, 130.8, 133.0, 136.0, 140.6, 144.8 \). HRMS (ESI-TOF) Calcd for C\(_{14}\)H\(_{10}\)Cl\(_2\)N\(_3\), [M+H]\(^+\) 290.0252; Found 290.0257.

2-(1-(naphthalen-2-yl)vinyl)-2\(H\)-benzo[\(d\)][1,2,3]triazole (4m).

2-vinylnaphthalene 1m (0.5 mmol, 72.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)\(_2\) (5% mol, 7.8 mg), Me\(_3\)SiH (0.5 mmol, 37.1 mg) and K\(_2\)S\(_2\)O\(_8\) (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 \( \times \) 3 mL). The combined organic layers were dried over anhydrous Na\(_2\)SO\(_4\) and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4m as pale yellow liquid (76%, 102.7 mg).

\(^1\)H NMR (400 MHz; CDCl\(_3\)): \( \delta = 5.80 (s, 1H), 6.31 (s, 1H), 7.44 (dd, \( J_1 = 3.2, J_2 = 6.4, \))
2-(1-(m-tolyl)vinyl)-2H-benzo[d][1,2,3]triazole (4n).

1-methyl-3-vinylbenzene 1n (0.5 mmol, 59.7 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg), Me₃SiH (0.5 mmol, 37.1 mg) and K₂S₂O₈ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4n as pale yellow liquid (75%, 88.2 mg).

1H NMR (400 MHz; CDCl₃): δ = 2.39 (s, 3H), 5.65 (s, 1H), 6.18 (s, 1H), 7.24 (t, J = 8.0, 3H), 7.32 (d, J = 7.6, 1H), 7.42 (dd, J₁ = 3.2, J₂ = 6.4, 2H), 7.92 (dd, J₁ = 3.2, J₂ = 6.8, 2H). ¹³C NMR (100 MHz; CDCl₃): δ = 21.4, 110.9, 118.5, 125.4, 127.2, 128.3, 128.8, 130.4, 134.6, 138.1, 144.7, 147.3. HRMS (ESI-TOF) Calcd for C₁₅H₁₄N₃, [M+H]⁺ 236.1188; Found 236.1192.

2-(1-(p-tolyl)vinyl)-2H-benzo[d][1,2,3]triazole (4o).

1-methyl-4-vinylbenzene 1o (0.5 mmol, 59.7 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)₂ (5% mol, 7.8 mg), Me₃SiH (0.5 mmol, 37.1 mg) and K₂S₂O₈ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4o as pale yellow liquid (79%, 88.2 mg).
92.9 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 2.42$ (s, 3H), 5.63 (s, 1H), 6.16 (s, 1H), 7.24 (d, $J = 8.0$, 2H), 7.34 (d, $J = 8.4$, 2H), 7.42 (dd, $J_1 = 2.8$, $J_2 = 6.8$, 2H), 7.92 (dd, $J_1 = 3.2$, $J_2 = 6.8$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 21.3$, 110.3, 118.5, 127.1, 128.2, 129.1, 131.8, 139.7, 144.6, 147.1. HRMS (ESI-TOF) Calcd for C$_{15}$H$_{14}$N$_3$, [M+H]$^+$ 236.1188; Found 236.1195.

2-(1-(4-(tert-butyl)phenyl)vinyl)-2$H$-benzo[d][1,2,3]triazole (4p).

1-(tert-butyl)-4-vinylbenzene 1p (0.5 mmol, 80.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4p as pale yellow liquid (74%, 102.6 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 1.36$ (s, 9H), 5.65 (s, 1H), 6.15 (s, 1H), 7.38-7.47 (m, 6H), 7.91 (dd, $J_1 = 3.2$, $J_2 = 6.4$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 31.2$, 34.7, 110.5, 118.5, 125.4, 127.1, 127.9, 131.6, 144.6, 147.1, 152.7. HRMS (ESI-TOF) Calcd for C$_{18}$H$_{20}$N$_3$, [M+H]$^+$ 278.1657; Found 278.1651.

2-(1-(4-(chloromethyl)phenyl)vinyl)-2$H$-benzo[d][1,2,3]triazole (4q).

1-(chloromethyl)-4-vinylbenzene 1q (0.5 mmol, 76.3 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was
purified by flash column chromatography to give the desired product 4q as pale yellow liquid (70%, 94.4 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 4.64$ (s, 2H), 5.67 (s, 1H), 6.24 (s, 1H), 7.42-7.46 (m, 6H), 7.90 (dd, $J_1 = 3.2$, $J_2 = 6.4$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 45.6$, 111.3, 118.4, 127.3, 128.6, 128.7, 134.6, 138.7, 144.7, 146.5. HRMS (ESI-TOF) Calcd for C$_{15}$H$_{13}$ClN$_3$ [M+H]$^+$ 270.0798; Found 270.0793.

4-(1-(2H-benzo[d][1,2,3]triazol-2-yl)vinyl)phenyl acetate (4r).

4-vinylphenyl acetate 1r (0.5 mmol, 81.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4r as white solid (67%, 93.6 mg), melting point: 90-91 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 2.33$ (s, 3H), 6.56 (s, 1H), 6.22 (s, 1H), 7.17 (d, $J = 8.4$, 2H), 7.42-7.49 (m, 4H), 7.90 (dd, $J_1 = 3.2$, $J_2 = 6.8$, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 21.2$, 111.2, 18.4, 121.7, 127.3, 129.5, 132.2, 144.7, 146.2, 151.1, 169.2. HRMS (ESI-TOF) Calcd for C$_{16}$H$_{14}$N$_3$O$_2$ [M+H]$^+$ 280.1086; Found 280.1092.

2-(cyclopent-1-en-1-yl)-2H-benzo[d][1,2,3]triazole (4s).

cyclopentene 1s (0.5 mmol, 34.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash
column chromatography to give the desired product 4s as white solid (78%, 72.2 mg), melting point: 91-92 °C.

\[ ^1H \text{ NMR (400 MHz; CDCl}_3\text{): } \delta = 2.16-2.23 \text{ (m, 2H), 2.65-2.69 (m, 2H), 3.16-3.20 (m, 2H), 6.63 (s, 1H), 7.37 (dd, } J_1 = 3.2, J_2 = 6.8, 2H), 7.86 (dd, } J_1 = 2.8, J_2 = 6.4, 2H). \]

\[ ^{13}C \text{ NMR (100 MHz; CDCl}_3\text{): } \delta = 22.1, 31.2, 31.4, 118.0, 121.2, 126.9, 141.8, 144.5. \]

HRMS (ESI-TOF) Calcd for C\textsubscript{11}H\textsubscript{12}N\textsubscript{3}, [M+H]\textsuperscript{+} 186.1031; Found 186.1037.

\( ^{(E)}-2-(\text{cyclohex-1-en-1-yl})-2H\text{-benzo}[d][1,2,3]\text{triazole (4t)}. \)

\( ^{(Z)}-\text{cyclohexene 1t (0.5 mmol, 41.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)}_2 \text{ (5% mol, 7.8 mg), Me}_3\text{SiH (0.5 mmol, 37.1 mg) and K}_2\text{S}_2\text{O}_8 \text{ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 \times 3 mL). The combined organic layers were dried over anhydrous Na}_2\text{SO}_4 \text{ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4t as white solid (73%, 72.7 mg), melting point: 65-66 °C.} \]

\[ ^1H \text{ NMR (400 MHz; CDCl}_3\text{): } \delta = 1.72-1.76 \text{ (m, 2H), 1.90-1.93 (m, 2H), 2.35-2.37 (m, 2H), 2.90-2.92 (m, 2H), 6.98 (s, 1H), 7.35 (dd, } J_1 = 2.8, J_2 = 6.4, 2H), 7.86 (dd, } J_1 = 3.2, J_2 = 6.4, 2H). \]

\[ ^{13}C \text{ NMR (100 MHz; CDCl}_3\text{): } \delta = 21.6, 22.3, 24.4, 25.6, 118.0, 120.7, 126.5, 138.2, 144.1. \text{ HRMS (ESI-TOF) Calcd for C}\textsubscript{12}H\textsubscript{14}N\textsubscript{3}, [M+H]\textsuperscript{+} 200.1188; \text{Found 200.1195.} \]

\( ^{(E)}-2-(\text{cyclooct-1-en-1-yl})-2H\text{-benzo}[d][1,2,3]\text{triazole (4u)}. \)

\( ^{(Z)}-\text{cyclooctene 1u (0.5 mmol, 55.1 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)}_2 \text{ (5% mol, 7.8 mg), Me}_3\text{SiH (0.5 mmol, 37.1 mg) and K}_2\text{S}_2\text{O}_8 \text{ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 \times 3 mL). The combined organic layers were dried over anhydrous Na}_2\text{SO}_4 \text{ and
concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4u as white solid (82%, 93.2 mg), melting point: 64-65 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 1.59-1.84$ (m, 8H), 2.38-2.43 (m, 2H), 3.11-3.14 (m, 2H), 6.96 (s, 1H), 7.35 (dd, $J_1 = 2.8$, $J_2 = 6.4, 2$H), 7.86 (dd, $J_1 = 3.2, J_2 = 6.4, 2$H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 25.9, 26.3, 26.4, 26.7, 28.5, 29.9, 118.0, 123.1, 126.5, 140.5, 144.2$. HRMS (ESI-TOF) Calcd for C$_{14}$H$_{18}$N$_3$, [M+H]$^+$ 228.1501; Found 228.1509.

2-(2,5-dihydrofuran-3-yl)-2H-benzo[d][1,2,3]triazole (4v).

2,5-dihydrofuran 1v (0.5 mmol, 35.0 mg), benzotriazole 2a (0.5 mmol, 59.6 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4v as white solid (69%, 64.6 mg), melting point: 116-117 °C.

$^1$H NMR (400 MHz; CDCl$_3$): $\delta = 4.99-5.02$ (m, 2H), 5.30-5.33 (m, 2H), 6.69 (t, $J = 2.0, 1$H), 7.42 (dd, $J_1 = 3.2, J_2 = 7.2, 2$H), 7.86 (d, $J = 2.8, 2$H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta = 72.2, 75.5, 115.2, 118.1, 127.6, 144.7$. HRMS (ESI-TOF) Calcd for C$_{10}$H$_{10}$ON$_3$, [M+H]$^+$ 188.0824; Found 188.0827.

5-methyl-2-(1-phenylvinyl)-2H-benzo[d][1,2,3]triazole (4w).

styrene 1a (0.5 mmol, 54.0 mg), 5-methyl-2H-benzo[d][1,2,3]triazole (0.5 mmol, 66.5 mg), (PhSe)$_2$ (5% mol, 7.8 mg), Me$_3$SiH (0.5 mmol, 37.1 mg) and K$_2$S$_2$O$_8$ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5
× 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4w as pale yellow liquid (70%, 82.4 mg).

¹H NMR (400 MHz; CDCl₃): δ = 2.51 (s, 3H), 5.64 (d, J = 0.8, 1H), 6.18 (d, J = 0.8, 1H), 7.25 (d, J = 1.2, 1H), 7.44-7.46 (m, 5H), 7.66 (d, J = 1.2, 1H), 7.79 (d, J = 8.8, 1H). ¹³C NMR (100 MHz; CDCl₃): δ = 22.2, 110.5, 116.5, 117.9, 128.2, 128.4, 129.5, 130.2, 134.7, 143.4, 145.2, 147.1. HRMS (ESI-TOF) Calcd for C₁₅H₁₄N₃, [M+H]⁺ 236.1188; Found 236.1194.

5-chloro-2-(1-phenylvinyl)-2H-benzo[d][1,2,3]triazole (4x).

styrene 1a (0.5 mmol, 54.0 mg), 5-chloro-2H-benzo[d][1,2,3]triazole (0.5 mmol, 76.7 mg), (PhSe)₂ (5% mol, 7.8 mg), Me₃SiH (0.5 mmol, 37.1 mg) and K₂S₂O₈ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na₂SO₄ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4x as white solid (74%, 94.6 mg), melting point: 65-66 °C.

¹H NMR (400 MHz; CDCl₃): δ = 5.68 (s, 1H), 6.24 (s, 1H), 7.35-7.46 (m, 6H), 7.84-7.92 (m, 2H). ¹³C NMR (100 MHz; CDCl₃): δ = 111.4, 117.4, 119.7, 128.3, 128.5, 128.8, 129.6, 133.1, 134.3, 143.2, 145.0, 147.0. HRMS (ESI-TOF) Calcd for C₁₄H₁₁ClN₃, [M+H]⁺ 256.0642; Found 256.0647.

5,6-dimethyl-2-(1-phenylvinyl)-2H-benzo[d][1,2,3]triazole (4y).

styrene 1a (0.5 mmol, 54.0 mg), 5,6-dimethyl-2H-benzo[d][1,2,3]triazole (0.5 mmol, 73.6 mg), (PhSe)₂ (5% mol, 7.8 mg), Me₃SiH (0.5 mmol, 37.1 mg) and K₂S₂O₈ (0.6 mmol, 162.0 mg). Then the reaction mixture was stirred in dioxane (2.0 mL) at 120 °C. Upon completion of the reaction (as monitored by TLC), the mixture was cooled
to room temperature and quenched with water before being extracted with dichloromethane (5 × 3 mL). The combined organic layers were dried over anhydrous Na$_2$SO$_4$ and concentrated under reduced pressure to give a residue, which was purified by flash column chromatography to give the desired product 4y as pale yellow liquid (75%, 93.5 mg).

$^1$H NMR (400 MHz; CDCl$_3$): $\delta$ = 2.42 (s, 6H), 5.61 (s, 1H), 6.16 (s, 1H), 7.44-7.45 (m, 5H), 7.65 (s, 2H). $^{13}$C NMR (100 MHz; CDCl$_3$): $\delta$ = 20.9, 110.2, 116.7, 128.2, 128.4, 129.4, 134.8, 137.9, 144.2, 147.1. HRMS (ESI-TOF) Calcd for C$_{16}$H$_{16}$N$_3$, [M+H]$^+$ 250.1344; Found 250.1339.

References:

4. 1-(Trimethylsilyl)-1H-benzotriazole 8 (CAS: 43183-36-4) is purchased directly from Sigma-Aldrich or TCI.
V. $^1$H NMR, and $^{13}$C NMR Spectra of Compounds 3 and 4

Compound 3a
Compound 3b
Compound 3c
Compound 3d
Compound 3e
Compound 3f
Compound 3g
Compound 3h
Compound 3j
Compound 3k
Compound 3l
Compound 3m
Compound 3n
Compound 3o

Chemical structures and spectra are shown for Compound 3o.
Compound 3p
Compound 3q
Compound 3s
Compound 4a
Compound 4b
Compound 4c
Compound 4d

[Chemical structure image]

[1H NMR spectrum image]

[13C NMR spectrum image]
Compound 4e
Compound 4f
Compound 4g
Compound 4i
Compound 4j
Compound 4l

[Chemical structure images]
Compound 4m

Compound 4n
Compound 4o
Compound 4q
Compound 4r
Compound 4s
Compound 4t
Compound 4u
Compound 4v
Compound 4w
Compound 4x
Compound 4y