

## Supporting Information

### Synthesis and antimitotic activity of 2-phenyl-6-pyridinyl-2*H*-pyrazolo[4,3-*c*]pyridines

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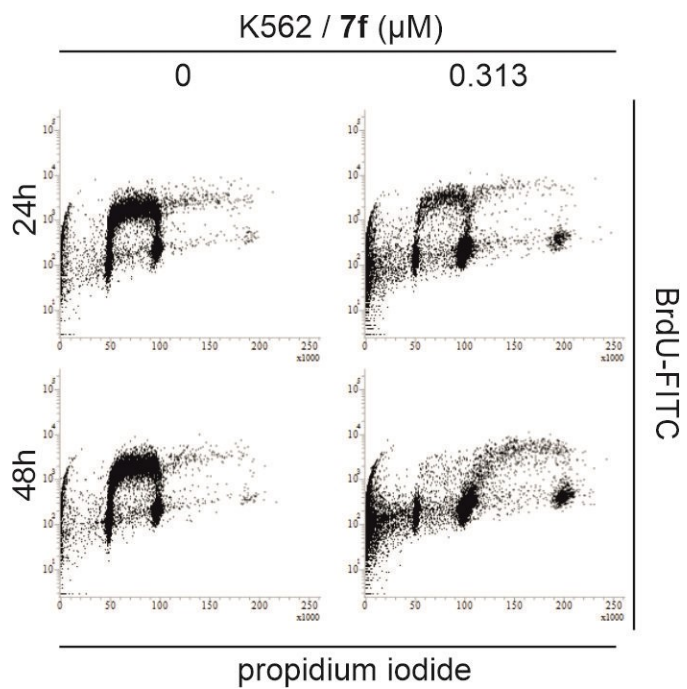
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† Vaida Aleksienė and Eva Řezníčková contributed equally to this work

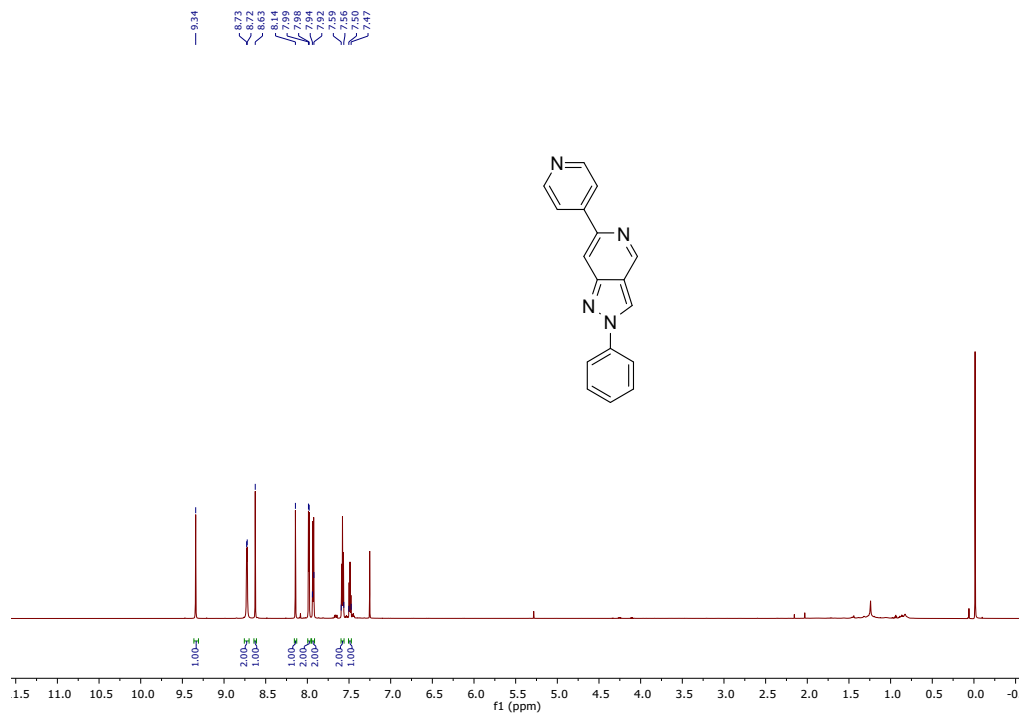
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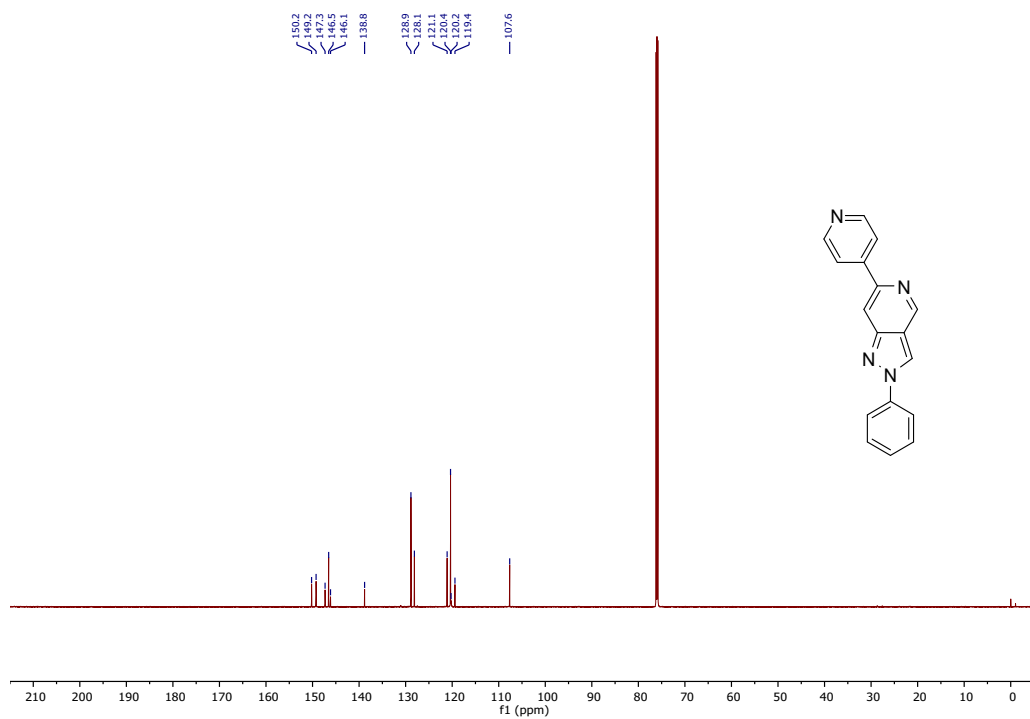
Vladimír Kryštof  
vladimir.krystof@upol.cz



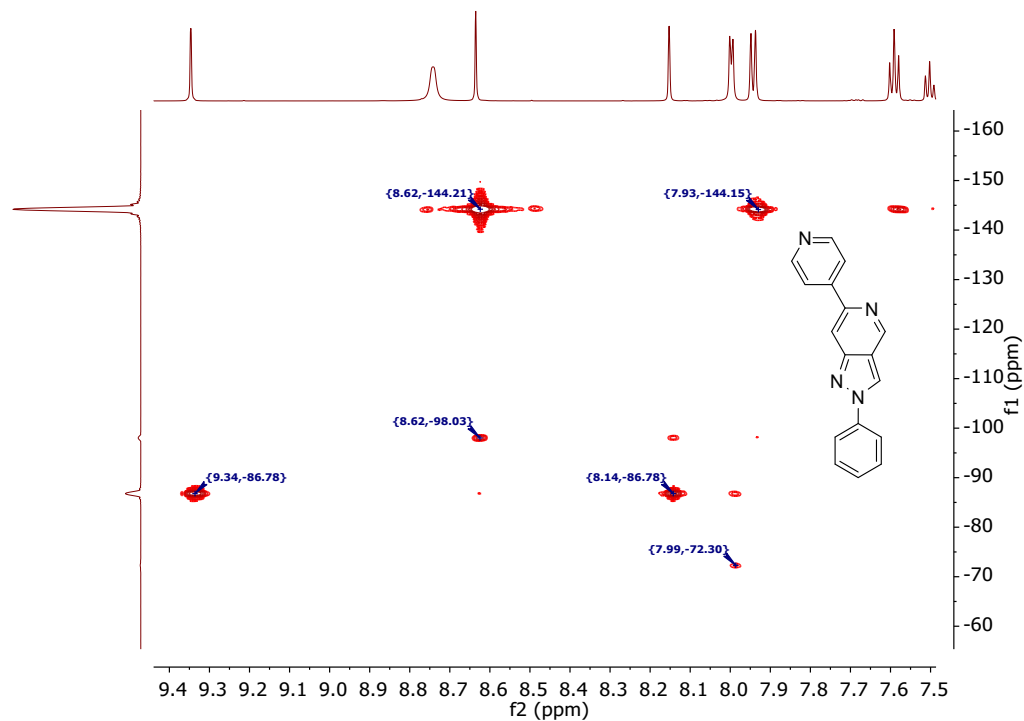
**Figure S1.** Analysis of cellular proliferation using BrdU incorporation in K562 cells treated with **7f** for 24 and 48 h



**Figure S2.** <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-4-yl)-2H-pyrazolo[4,3-c]pyridine (7a)

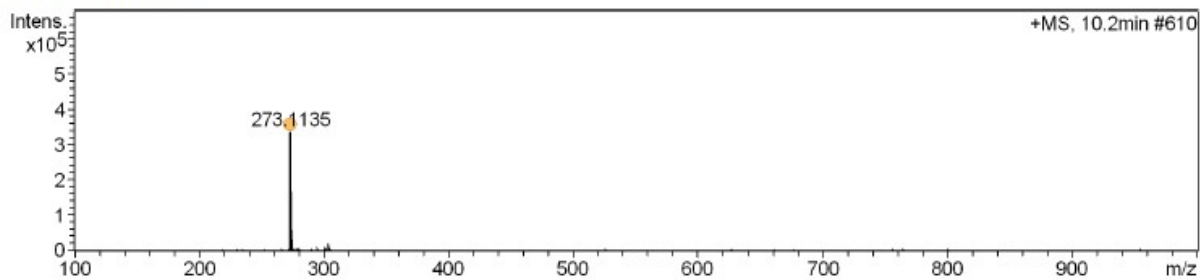


**Figure S3.** <sup>13</sup>C NMR spectrum (176 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-4-yl)-2H-pyrazolo[4,3-c]pyridine (7a)



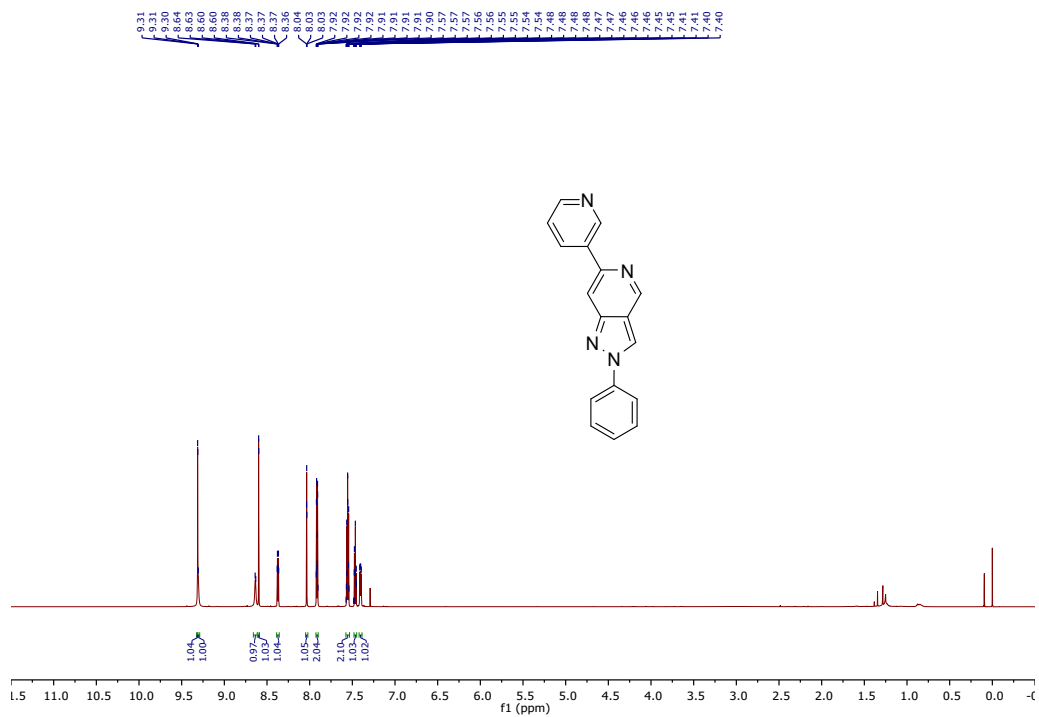
**Figure S4.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-phenyl-6-(pyridin-4-yl)-2H-pyrazolo[4,3-c]pyridine (**7a**)

+MS, 10.2min #610

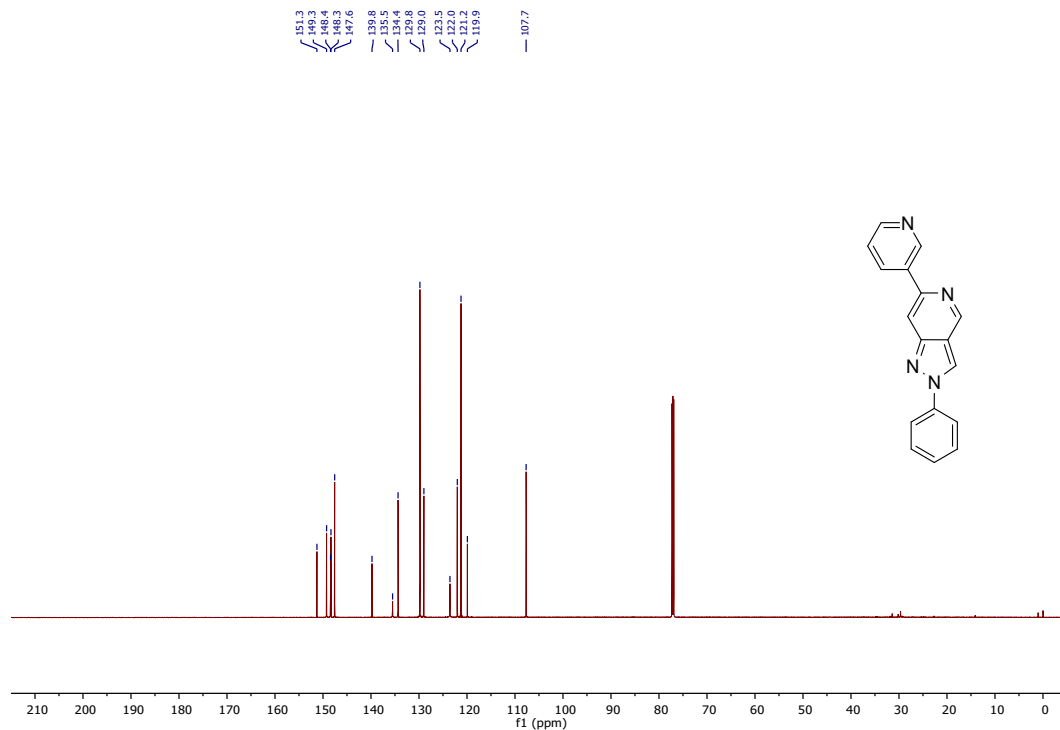


Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
273.1135	1	C <sub>17</sub> H <sub>13</sub> N <sub>4</sub>	273.1135	-0.1	8.7	1	100.00	13.5	even	ok

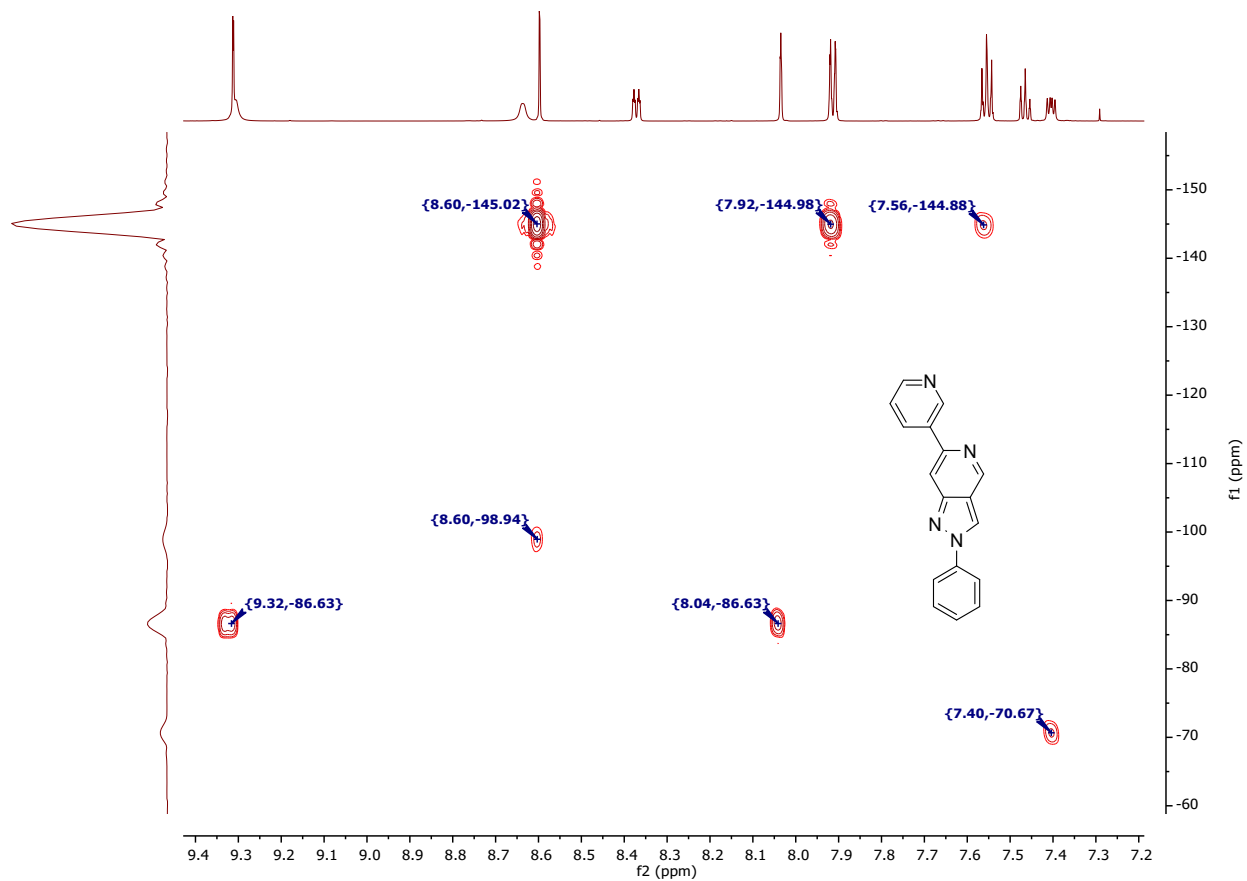
**Figure S5.** HRMS (ESI) report of **7a**



**Figure S6.** <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-3-yl)-2H-pyrazolo[4,3-c]pyridine (**7b**)

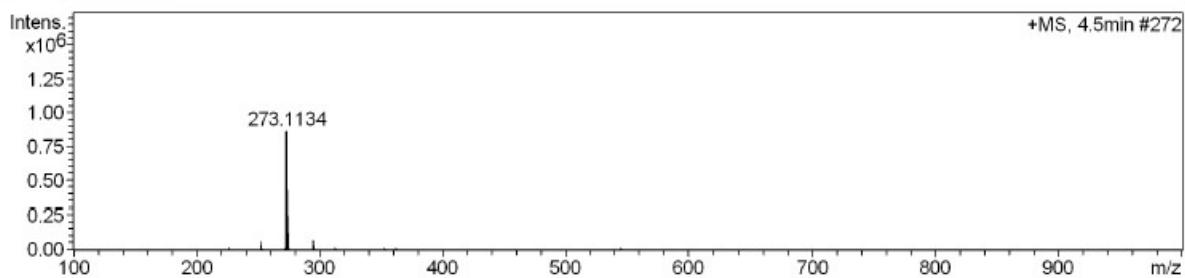


**Figure S7.** <sup>13</sup>C NMR spectrum (176 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-3-yl)-2H-pyrazolo[4,3-c]pyridine (**7b**)



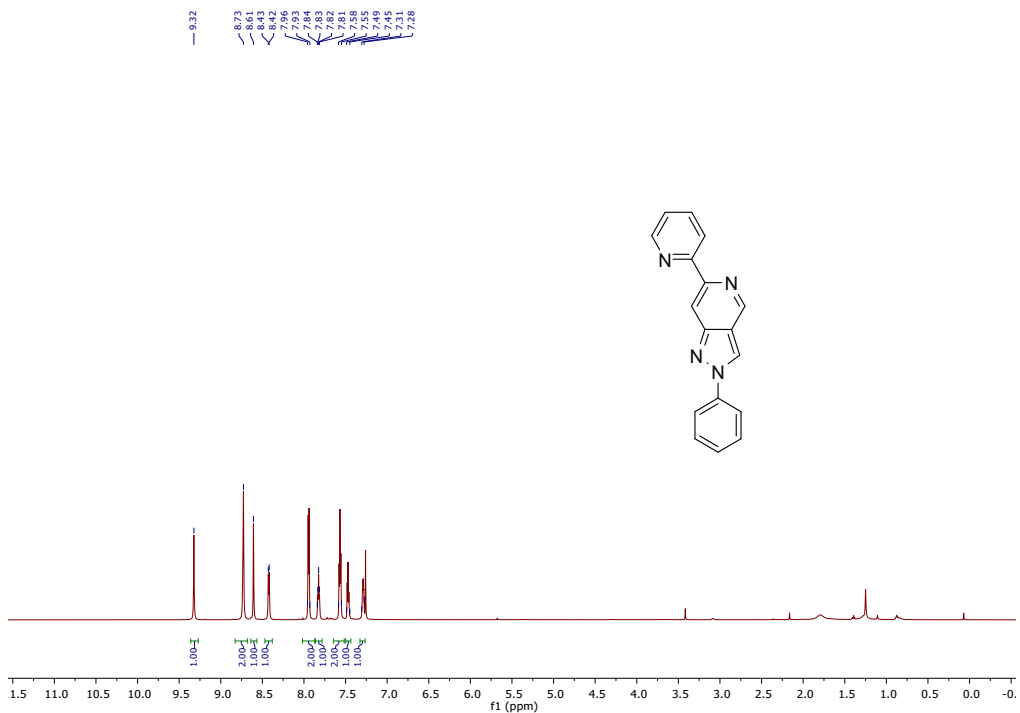
**Figure S8.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-phenyl-6-(pyridin-3-yl)-2H-pyrazolo[4,3-c]pyridine (**7b**)

+MS, 4.5min #272

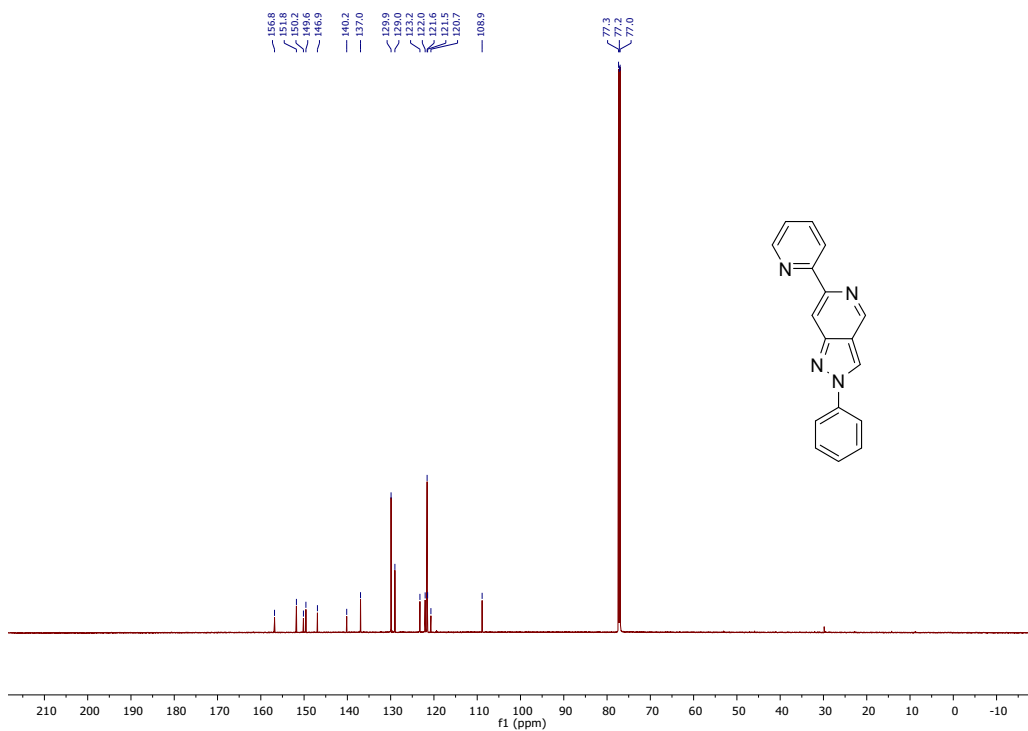


Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
273.1134	1	C <sub>17</sub> H <sub>13</sub> N <sub>4</sub>	273.1135	0.4	52.7	1	100.00	13.5	even	ok

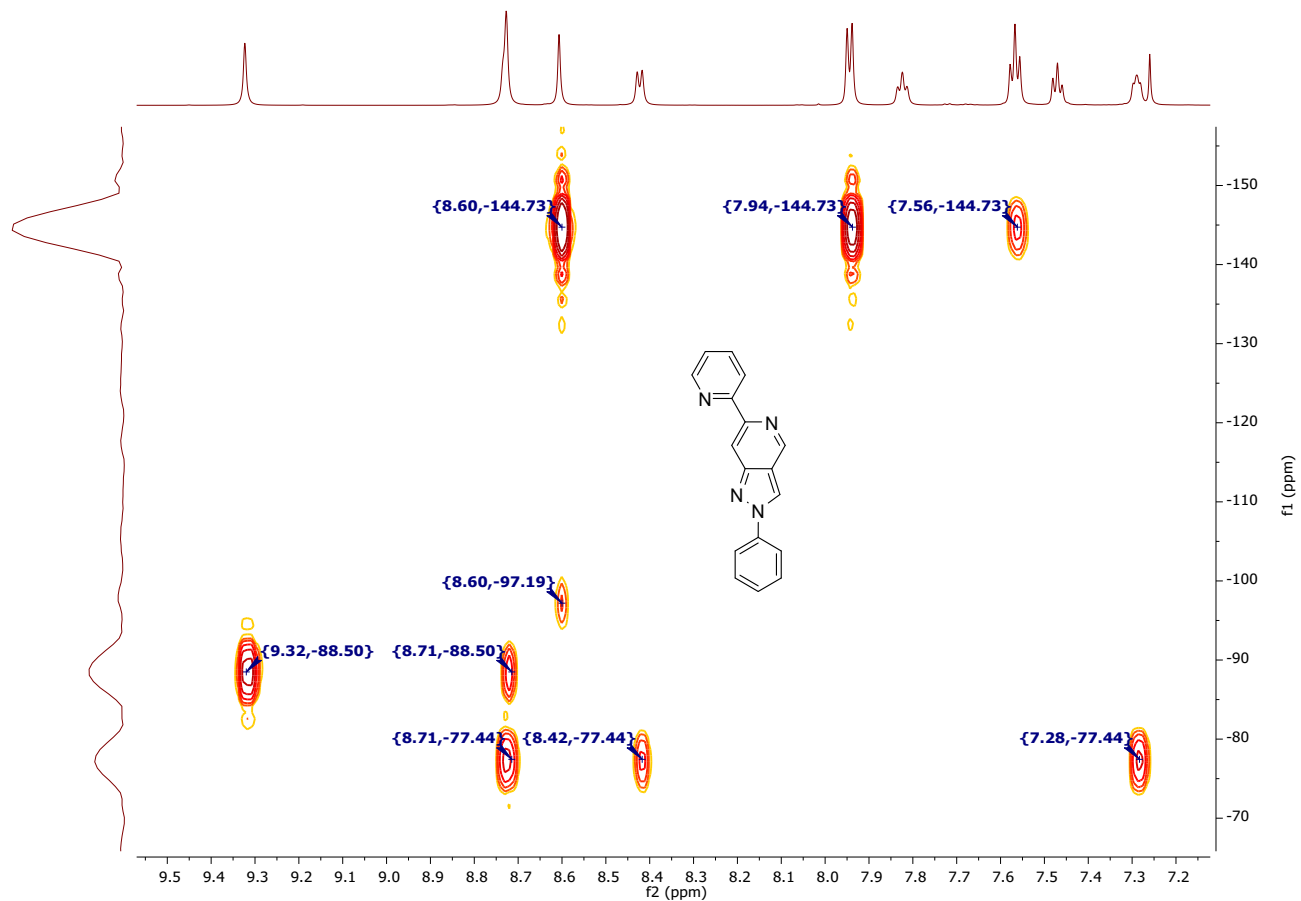
**Figure S9.** HRMS (ESI) report of **7b**



**Figure S10.** <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (7c)

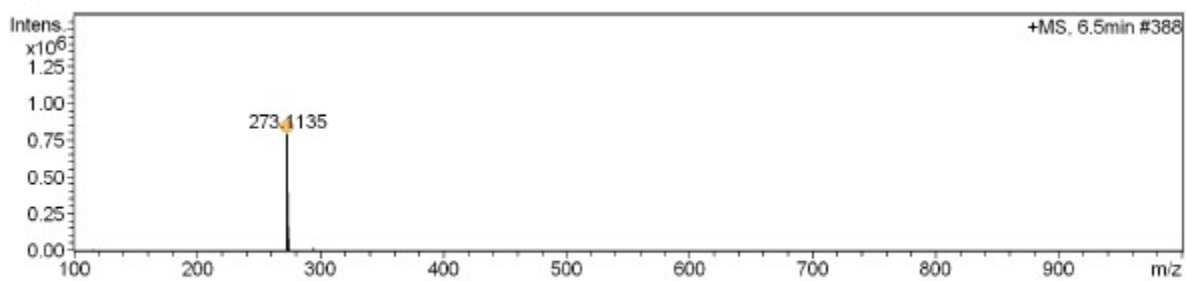


**Figure S11.** <sup>13</sup>C NMR spectrum (176 MHz, CDCl<sub>3</sub>) of 2-phenyl-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (7c)



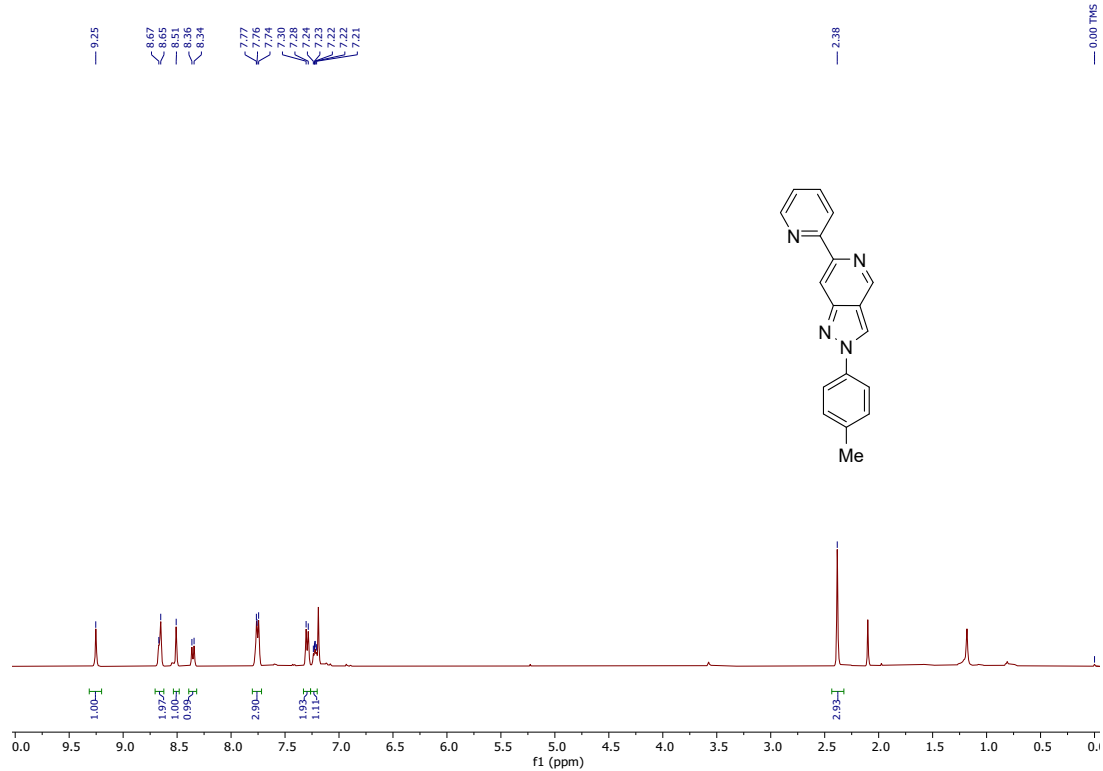
**Figure S12.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-phenyl-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7c**)

+MS, 6.5min #388

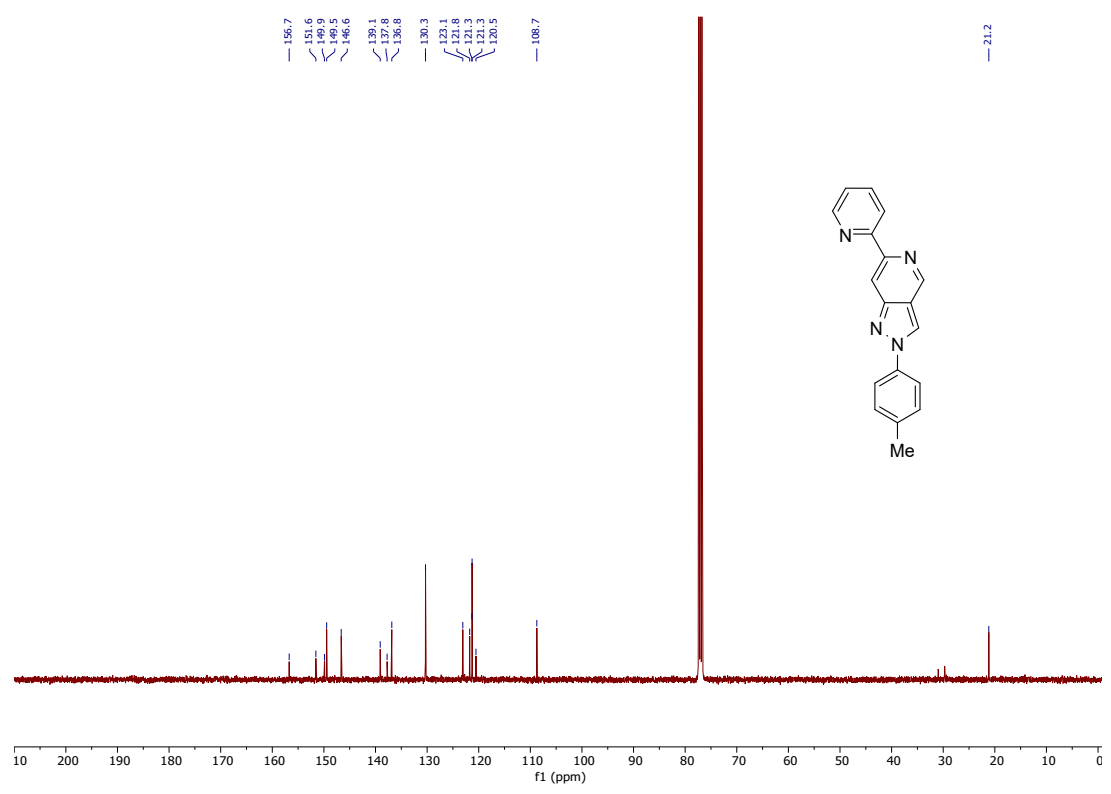


Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
273.1135	1	C <sub>17</sub> H <sub>13</sub> N <sub>4</sub>	273.1135	-0.1	8.0	1	100.00	13.5	even	ok

**Figure S13.** HRMS (ESI) report of **7c**

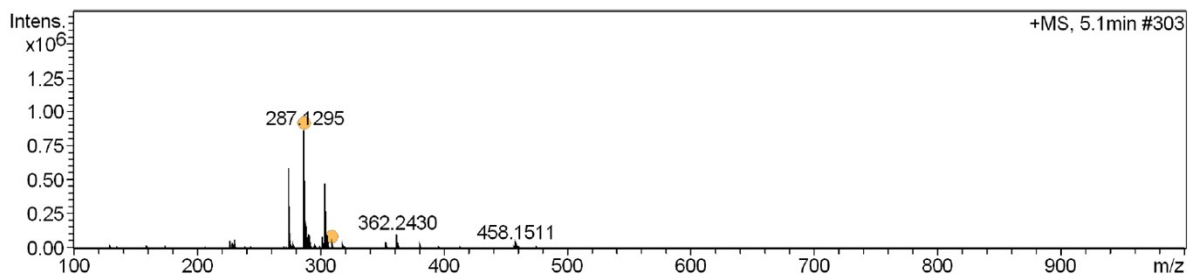


**Figure S14.** <sup>1</sup>H NMR spectrum (400 MHz, CDCl<sub>3</sub>) of 2-(4-methylphenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7d**)



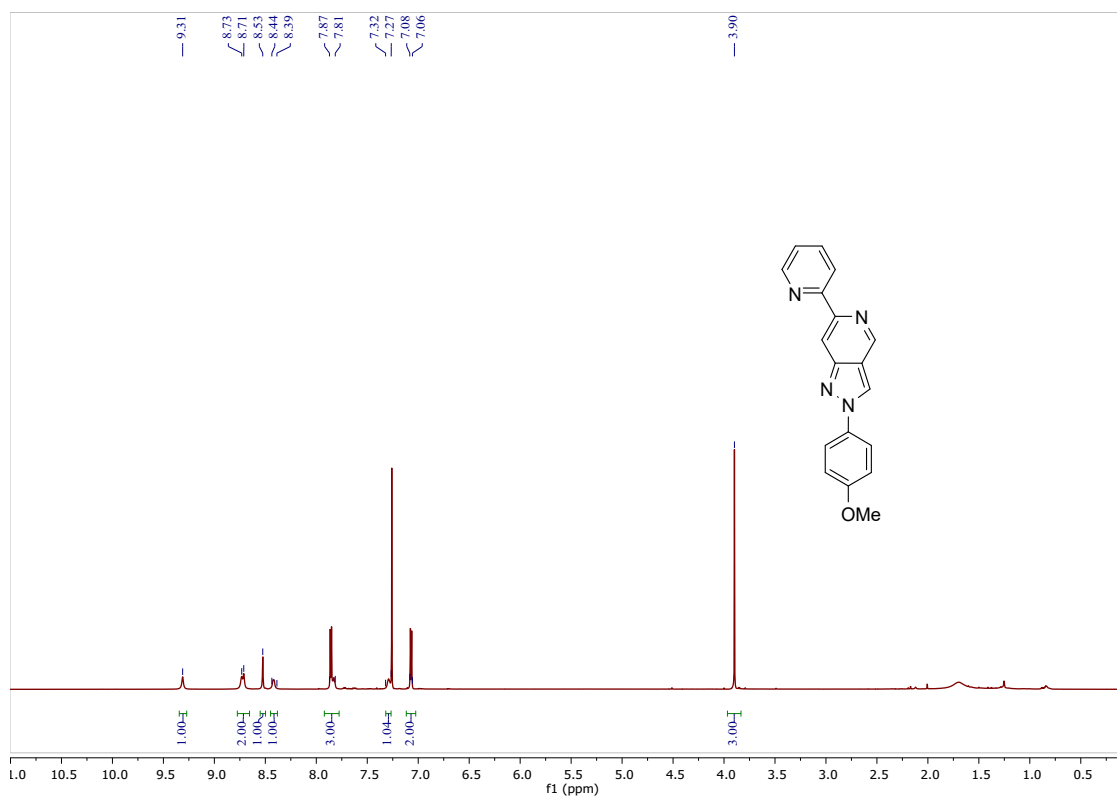
**Figure S15.**  $^{13}\text{C}$  NMR spectrum (101 MHz,  $\text{CDCl}_3$ ) of 2-(4-methylphenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7d**)

+MS, 5.1min #303

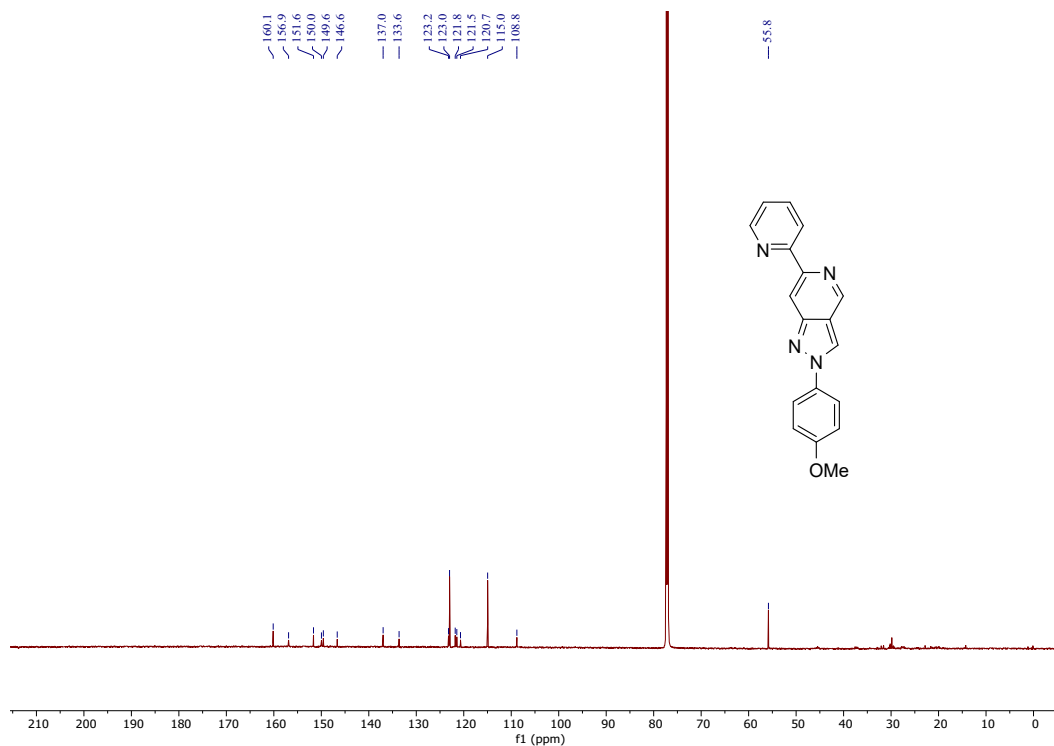


Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
287.1295	1	C <sub>18</sub> H <sub>15</sub> N <sub>4</sub>	287.1291	1.3	12.7	1	100.00	13.5	even	ok
309.1102	1	C <sub>18</sub> H <sub>14</sub> N <sub>4</sub> Na	309.1111	-2.9	30.1	1	100.00	13.5	even	ok

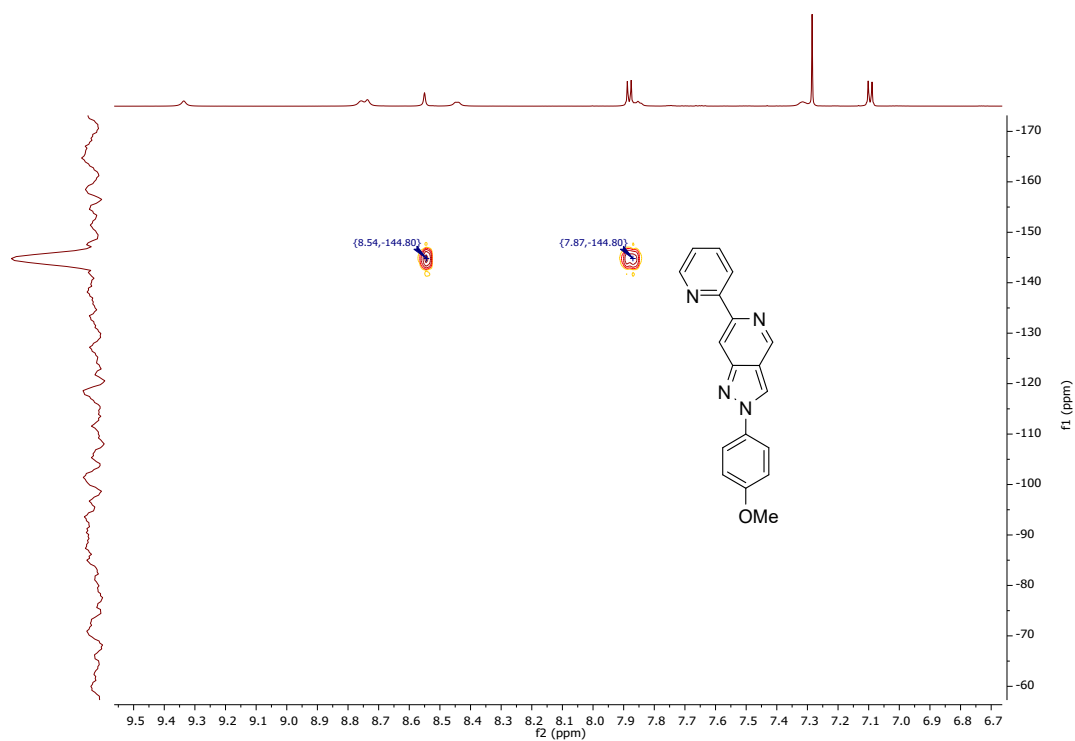
**Figure S16.** HRMS (ESI) report of **7d**



**Figure S17.**  $^1\text{H}$  NMR spectrum (700 MHz,  $\text{CDCl}_3$ ) of 2-(4-methoxyphenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7e**)

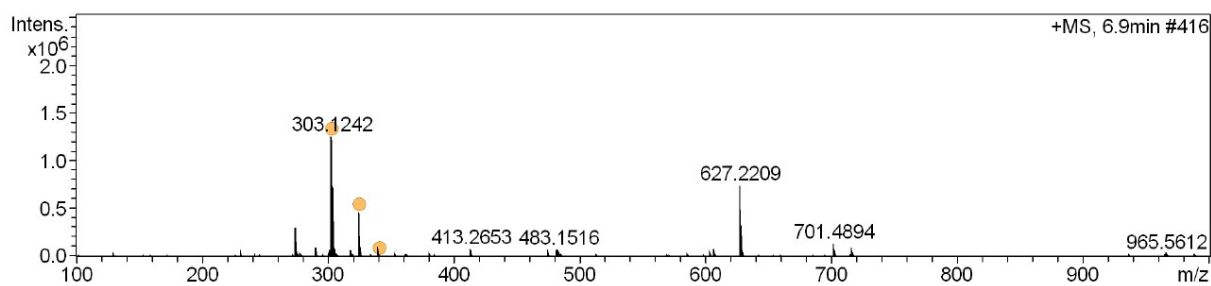


**Figure S18.**  $^{13}\text{C}$  NMR spectrum (176 MHz,  $\text{CDCl}_3$ ) of 2-(4-methoxyphenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7e**)



**Figure S19.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-(4-methoxyphenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7e**)

+MS, 6.9min #416



Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
303.1242	1	C18H15N4O	303.1240	0.4	217.5	1	100.00	13.5	even	ok
325.1057	1	C18H14N4NaO	325.1060	0.8	2.1	1	100.00	13.5	even	ok
341.0822	1	C18H14KN4O	341.0799	-6.7	26.4	1	100.00	13.5	even	ok

Figure S20. HRMS (ESI) report of 7e

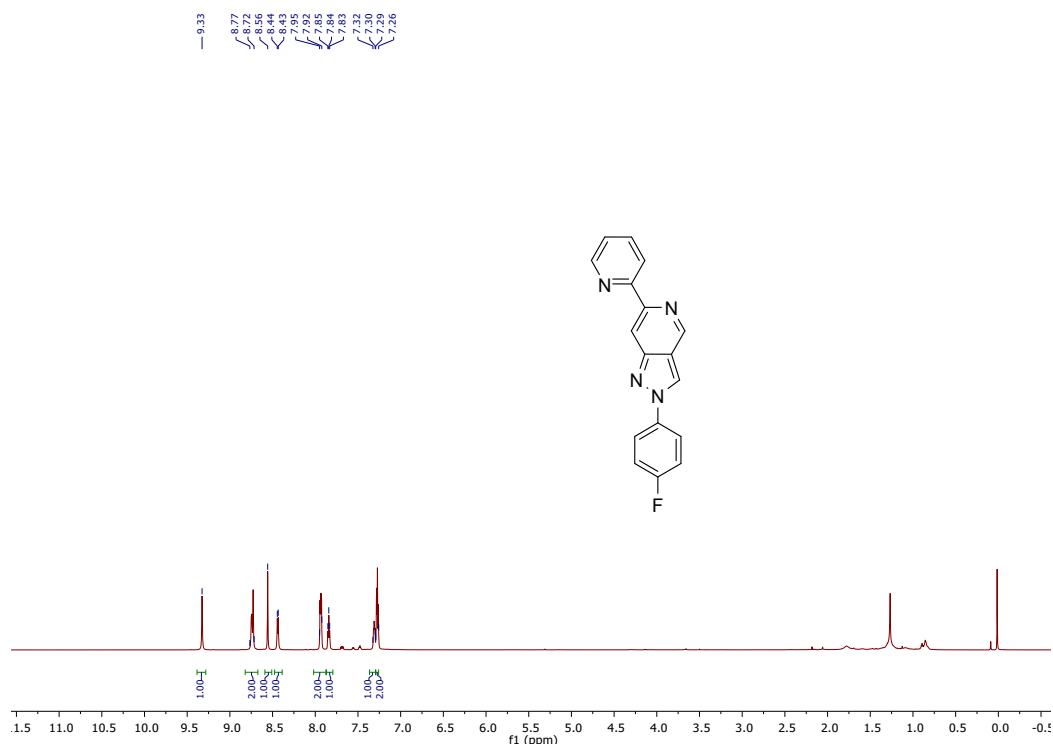
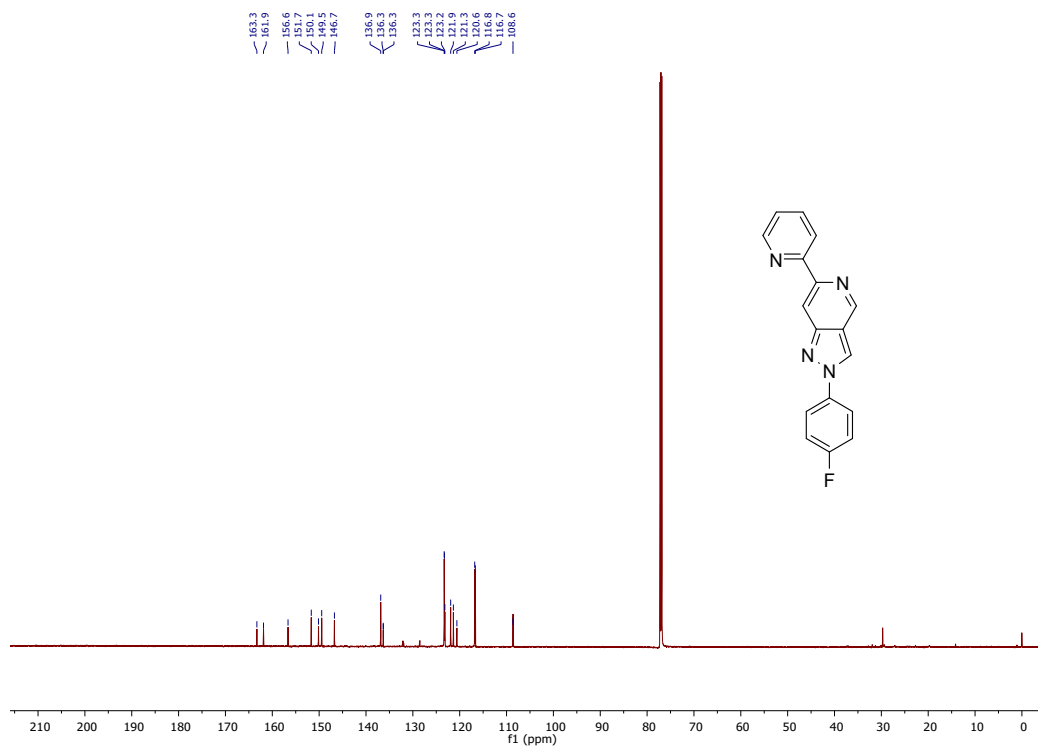
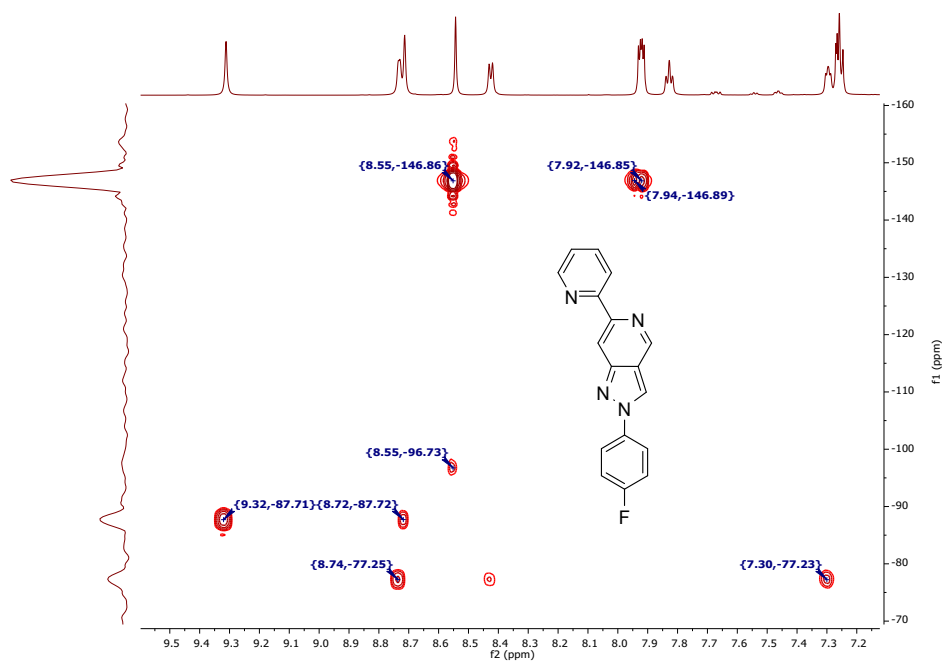


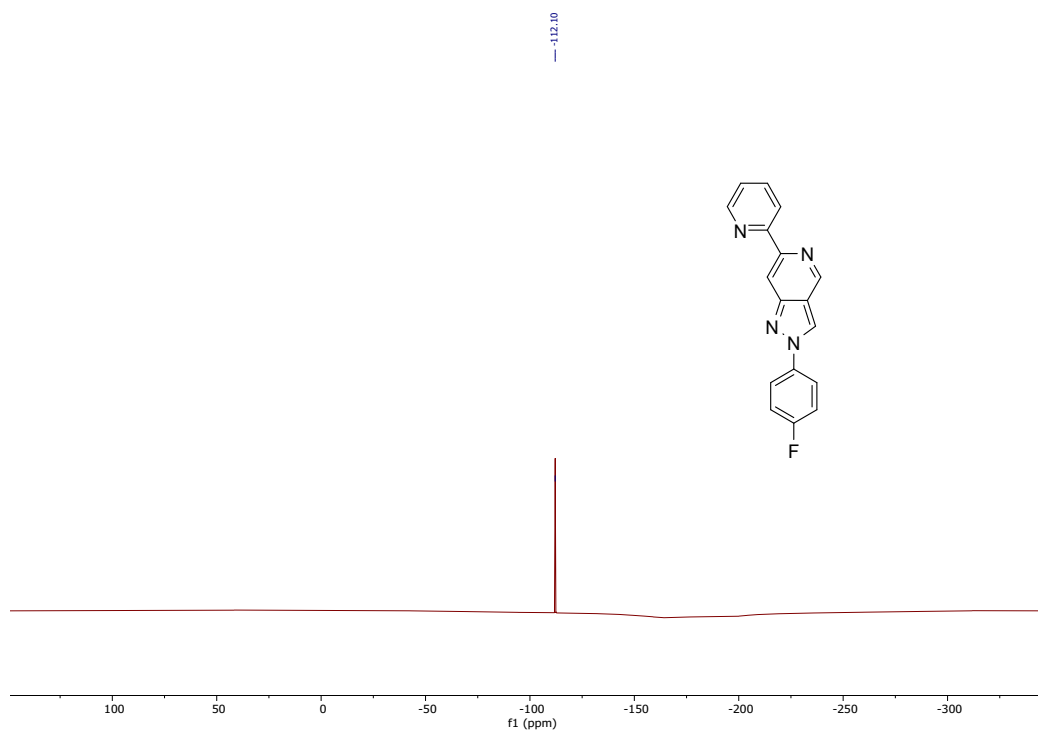
Figure S21. <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-(4-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (7f)



**Figure S22.**  $^{13}\text{C}$  NMR spectrum (176 MHz,  $\text{CDCl}_3$ ) of 2-(4-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7f**)

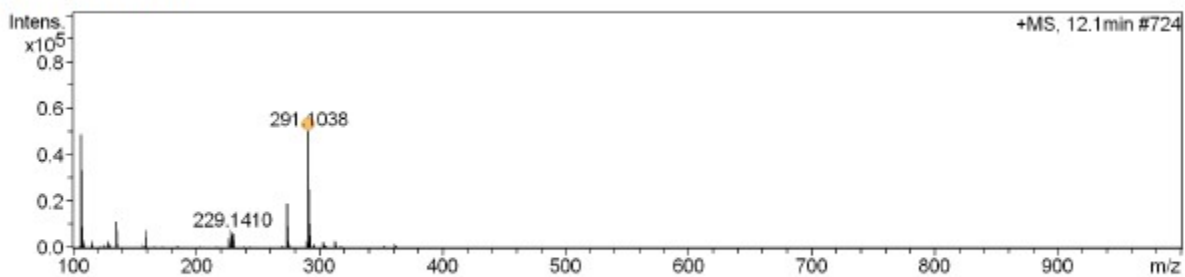


**Figure S23.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-(4-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7f**)



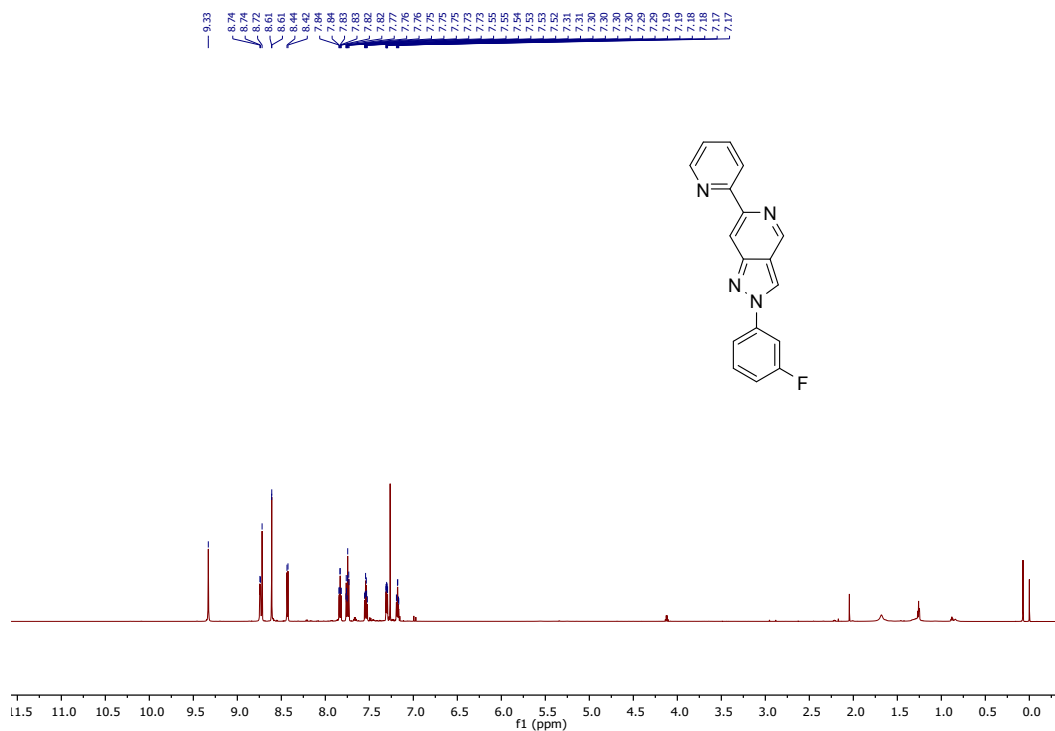
**Figure S24.**  $^{19}\text{F}$  NMR spectrum (376 MHz,  $\text{CDCl}_3$ ) of 2-(4-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7f**)

+MS, 12.1min #724

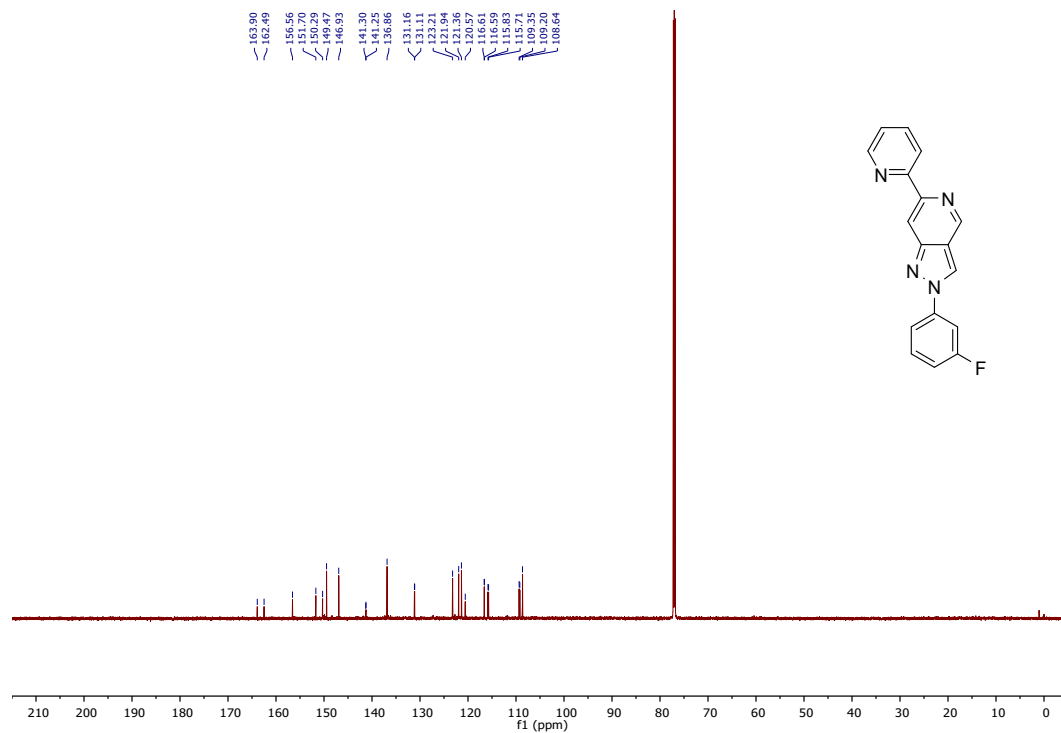


Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
291.1038	1	C <sub>17</sub> H <sub>12</sub> FN <sub>4</sub>	291.1041	1.0	6.5	2	100.00	13.5	even	ok

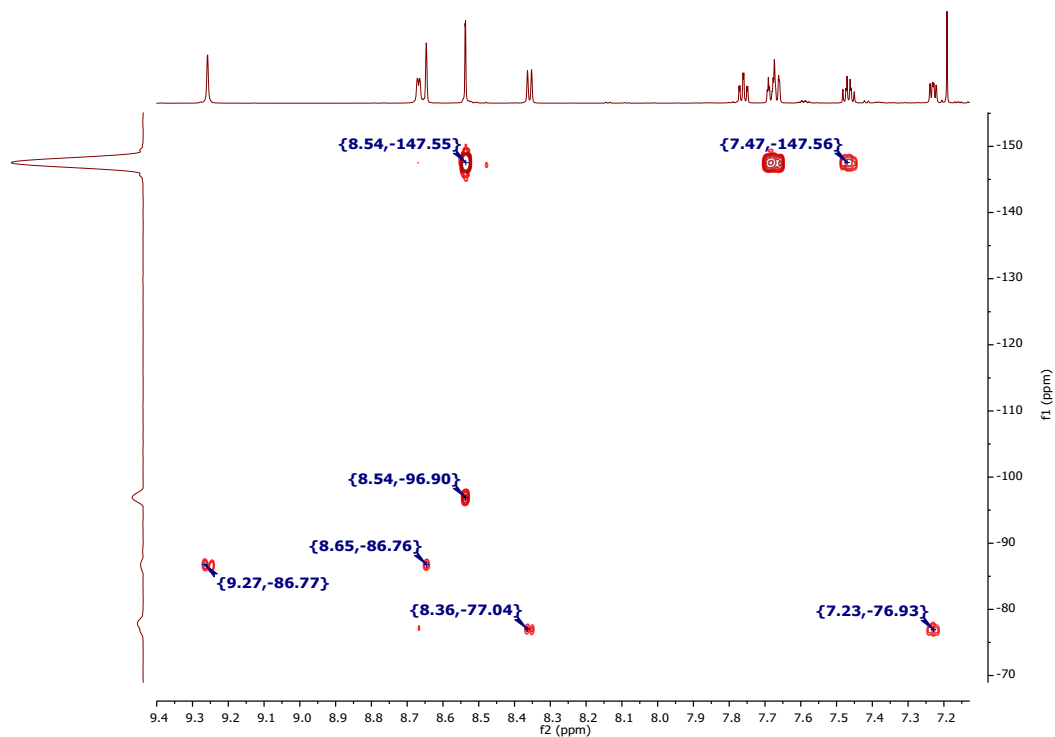
**Figure S25.** HRMS (ESI) report of **7f**



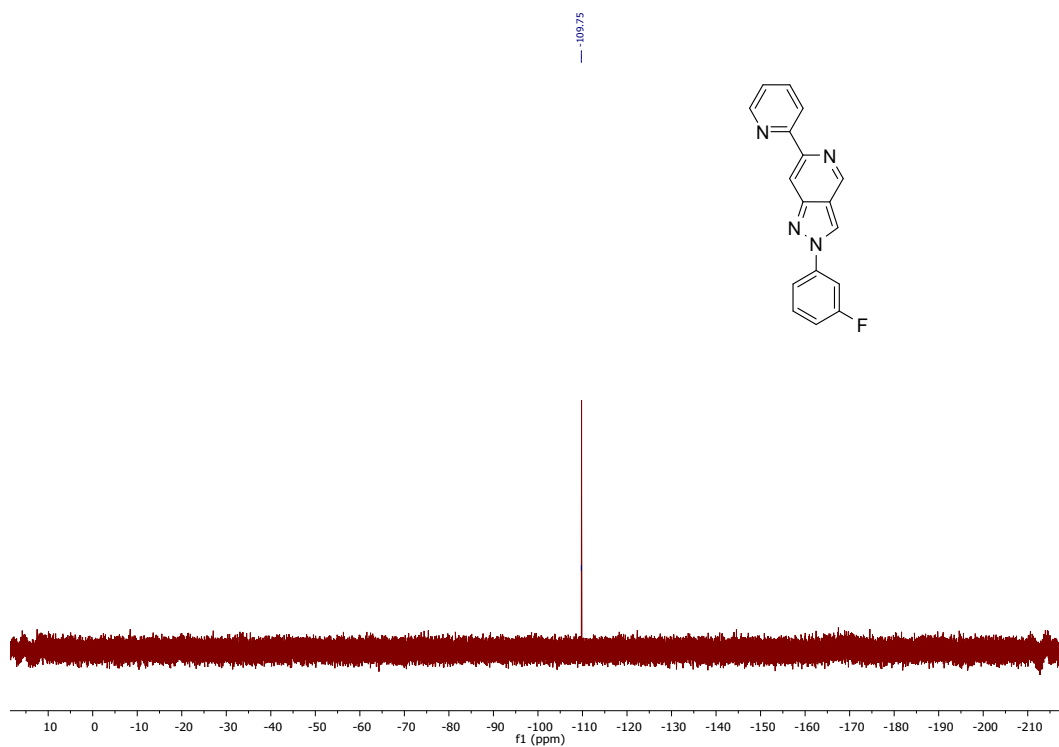
**Figure S26.** <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-(3-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7g**)



**Figure S27.** <sup>13</sup>C NMR spectrum (176 MHz, CDCl<sub>3</sub>) of 2-(3-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7g**)

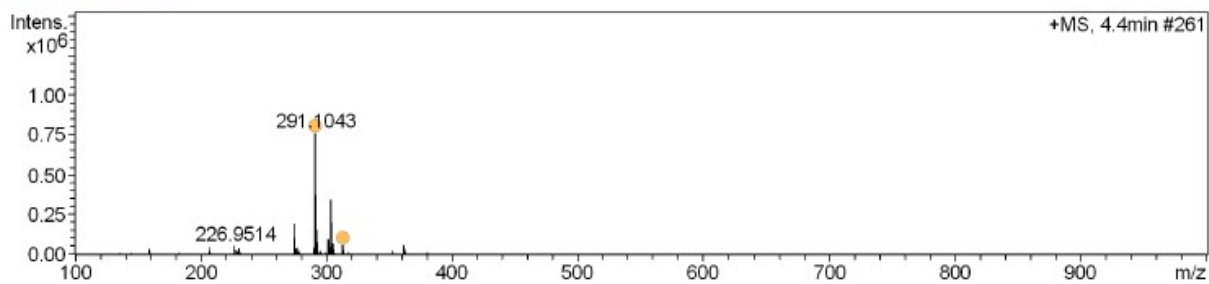


**Figure S28.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-(3-fluorophenyl)-6-(pyridin-2-yl)-2*H*-pyrazolo[4,3-*c*]pyridine (**7g**)



**Figure S29.**  $^{19}\text{F}$  NMR spectrum (376 MHz,  $\text{CDCl}_3$ ) of 2-(3-fluorophenyl)-6-(pyridin-2-yl)-2*H*-pyrazolo[4,3-*c*]pyridine (**7g**)

+MS, 4.4min #261



Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
291.1043	1	C17H12FN4	291.1041	-0.8	9.0	1	100.00	13.5	even	ok
313.0857	1	C17H11FN4Na	313.0860	0.8	3.0	1	100.00	13.5	even	ok

Figure S30. HRMS (ESI) report of **7g**

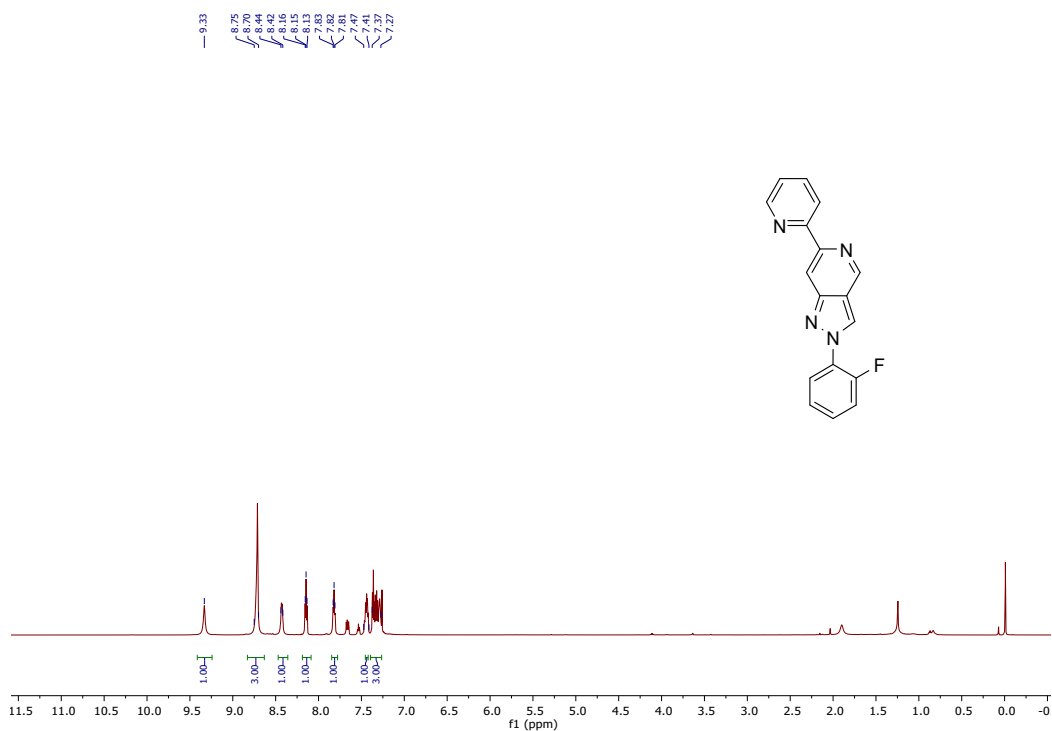
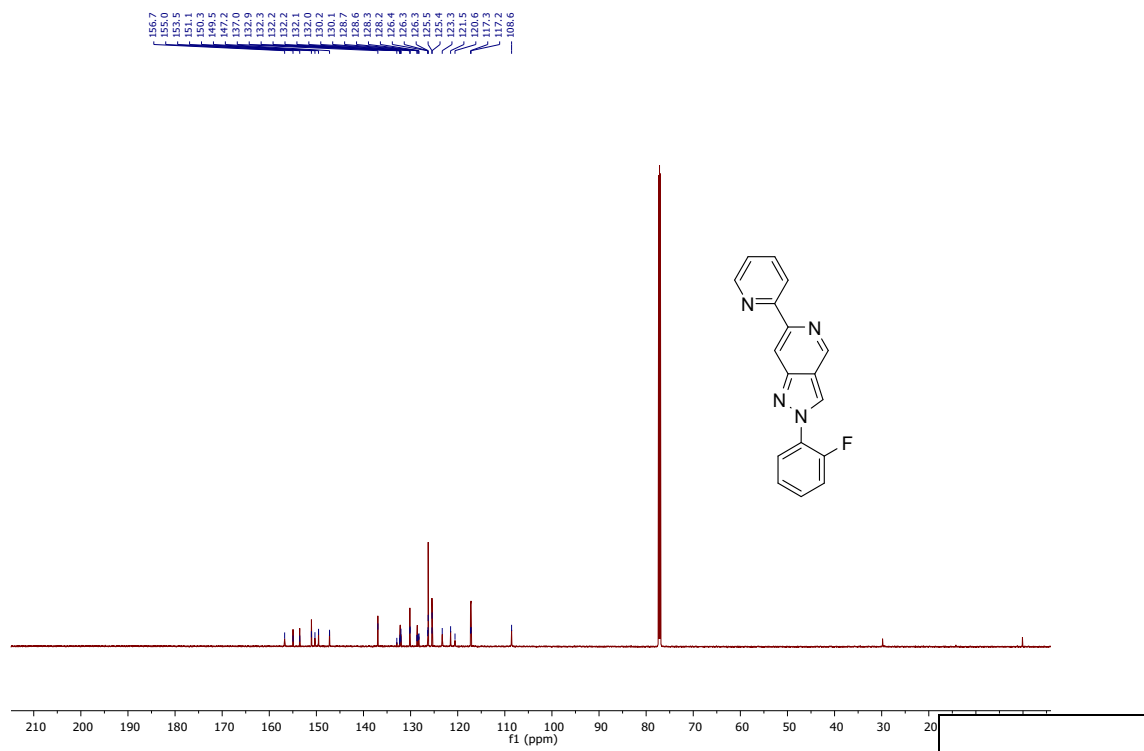
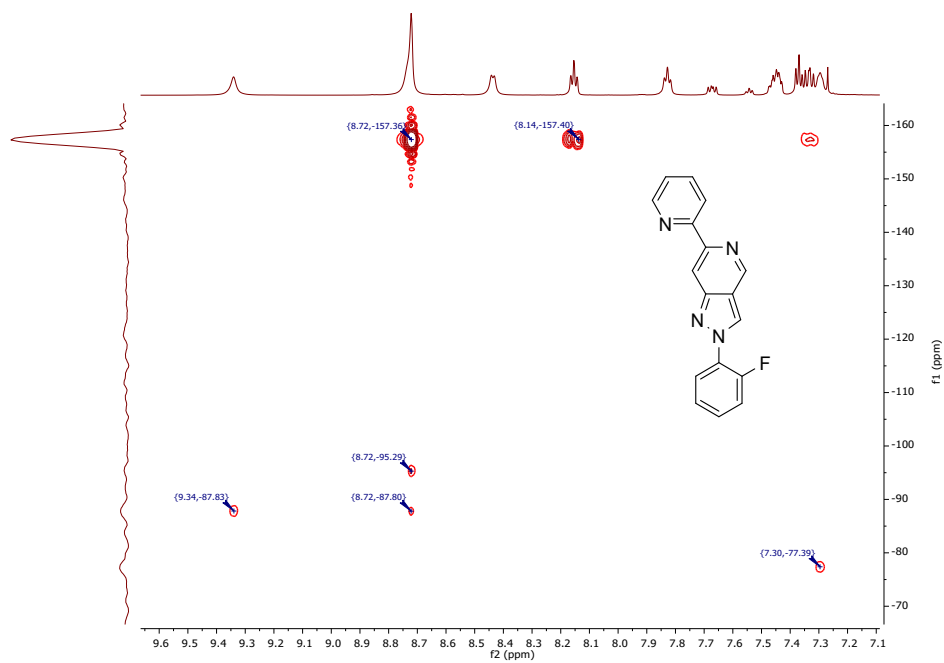


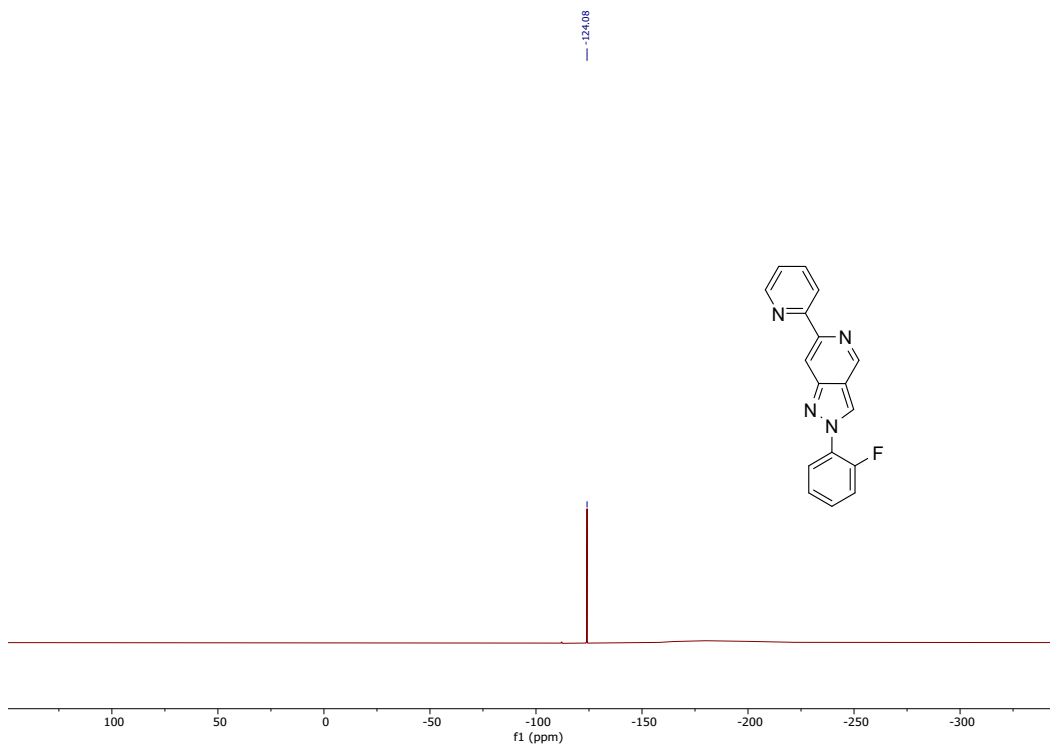
Figure S31. <sup>1</sup>H NMR spectrum (700 MHz, CDCl<sub>3</sub>) of 2-(2-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7h**)



**Figure S32.**  $^{13}\text{C}$  NMR spectrum (176 MHz,  $\text{CDCl}_3$ ) of 2-(2-fluorophenyl)-6-(pyridin-2-yl)-2*H*-pyrazolo[4,3-*c*]pyridine (**7h**)

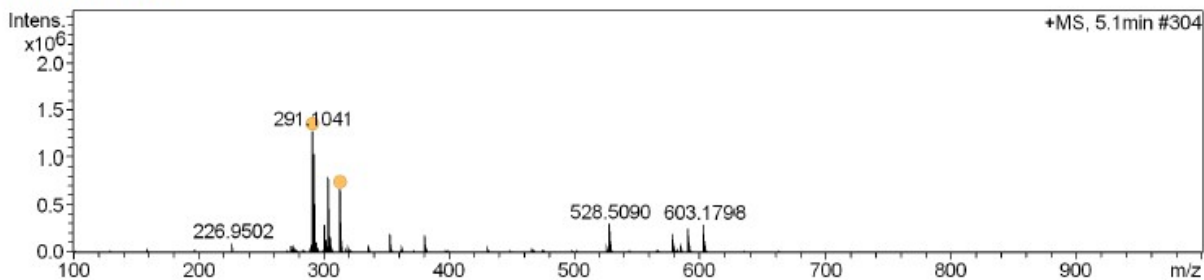


**Figure S33.**  $^1\text{H}$ - $^{15}\text{N}$  HMBC NMR spectrum (71 MHz,  $\text{CDCl}_3$ ) of 2-(2-fluorophenyl)-6-(pyridin-2-yl)-2*H*-pyrazolo[4,3-*c*]pyridine (**7h**)



**Figure S34.**  $^{19}\text{F}$  NMR spectrum (376 MHz,  $\text{CDCl}_3$ ) of 2-(2-fluorophenyl)-6-(pyridin-2-yl)-2H-pyrazolo[4,3-c]pyridine (**7h**)

**+MS, 5.1min #304**



Meas. m/z	#	Ion Formula	m/z	err [ppm]	mSigma	# Sigma	Score	rdb	e <sup>-</sup> Conf	N-Rule
291.1041	1	C <sub>17</sub> H <sub>12</sub> FN <sub>4</sub>	291.1041	0.2	351.4	1	100.00	13.5	even	ok
313.0855	1	C <sub>17</sub> H <sub>11</sub> FN <sub>4</sub> Na	313.0860	-1.7	1.1	1	100.00	13.5	even	ok
	1	C <sub>17</sub> H <sub>11</sub> FN <sub>4</sub> Na	313.0860	-1.7	1.1	1	100.00	13.5	even	ok

**Figure S35.** HRMS (ESI) report of **7h**