

## Supporting Information

# Synthesis, and Anticancer Evaluation of 4-[(Indol-3-yl)-arylmethyl]-1-phenyl-3-methyl-5-pyrazolone Derivatives via a Magnetic Aminated Starch Biocatalyst

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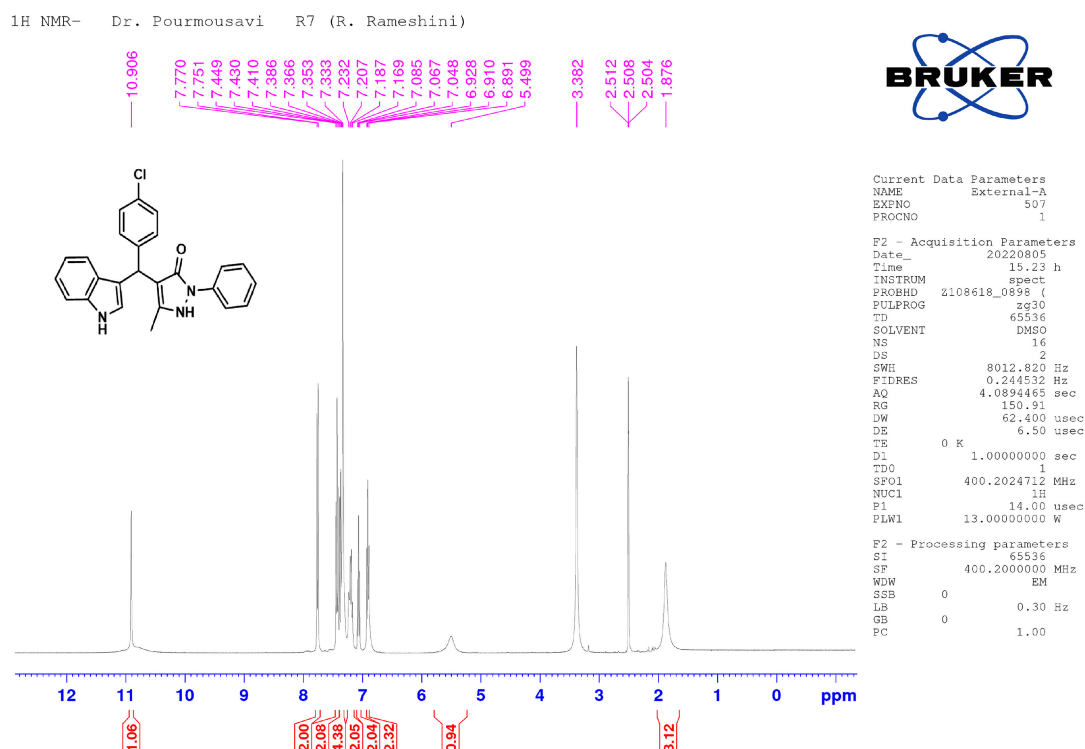
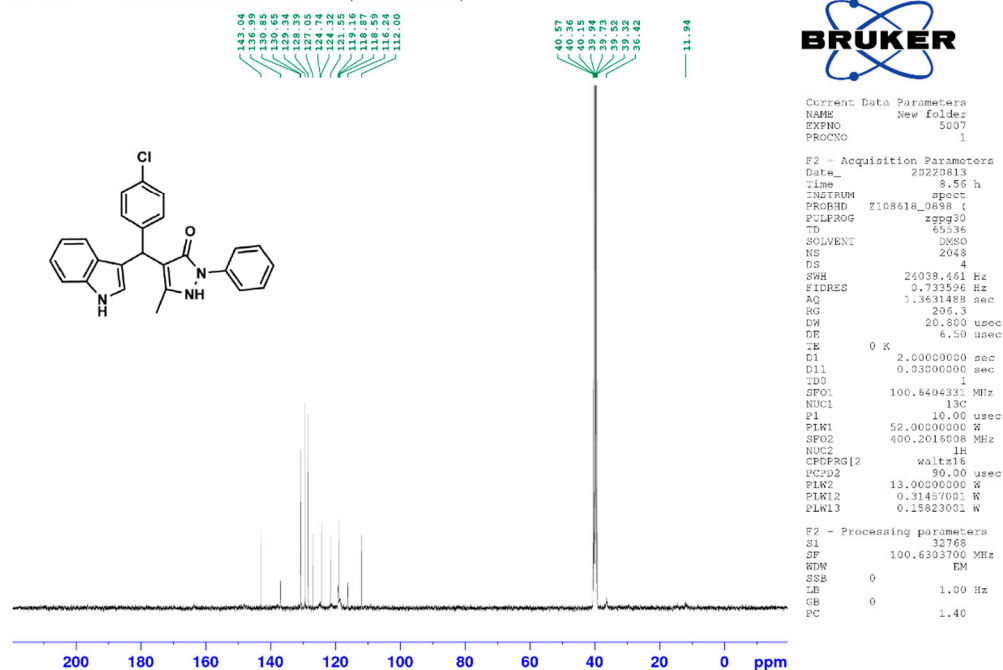


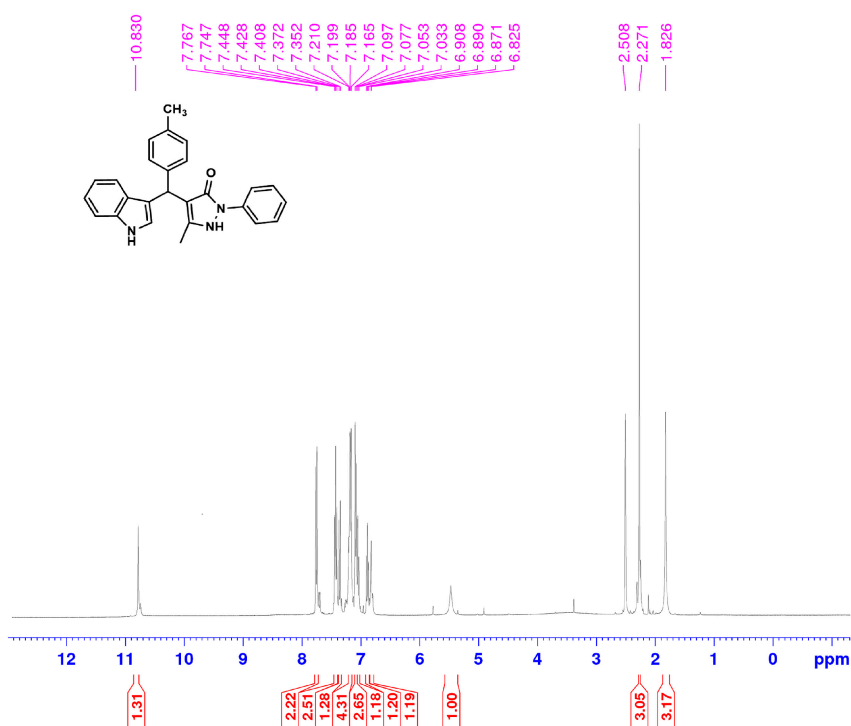
Figure S1: <sup>1</sup>H-NMR spectrum of 4-((4-chlorophenyl)(1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6b)

<sup>13</sup>C NMR- Dr. Pourmousavi R 7 (A. Ramshini)



**Figure S2:** <sup>13</sup>C-NMR spectrum of 4-((4-chlorophenyl)(1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6b)

<sup>1</sup>H NMR- Dr. Pourmousavi R20 (R. Rameshini)

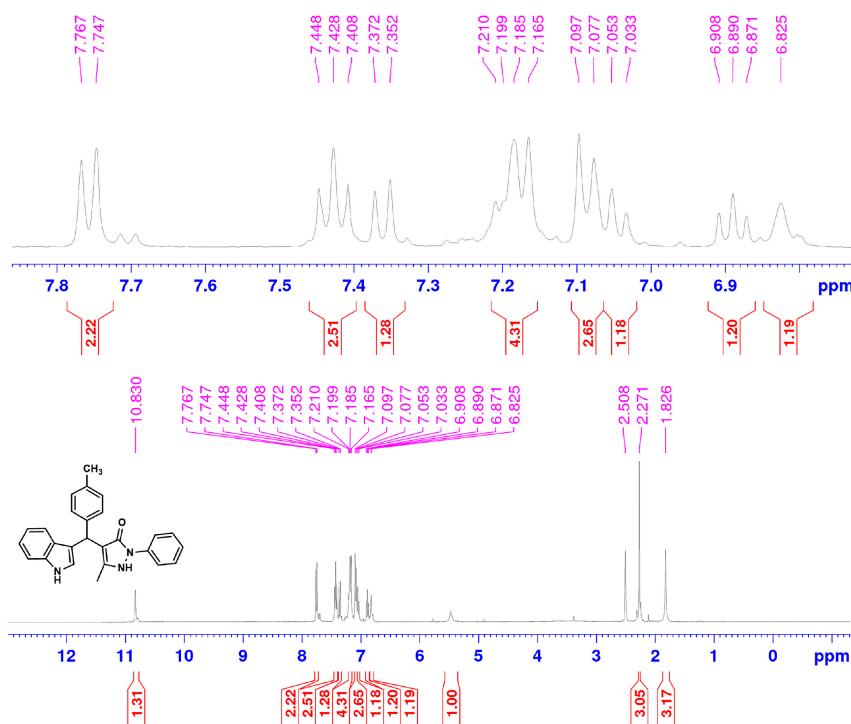


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<sup>1</sup>H NMR- Dr. Pourmousavi R20 (R. Rameshini)



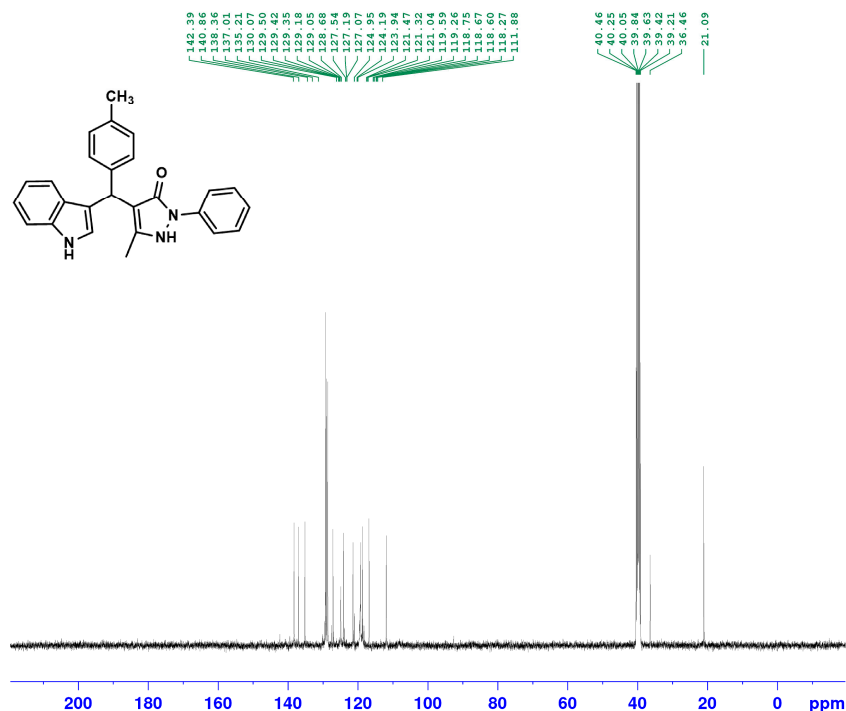
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Figure S3: <sup>1</sup>H-NMR spectrum of 4-((1H-indol-3-yl)(p-tolyl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6c)

<sup>13</sup>C NMR- Dr. Pourmousavi R20 (A. Ramshini)



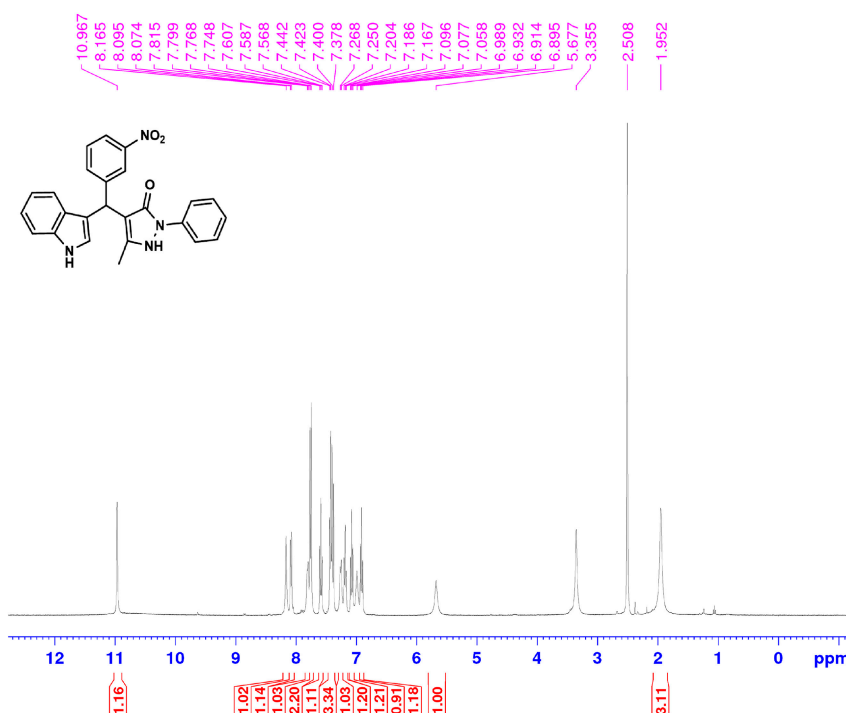
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SFO2 400.2016008 MHz  
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Figure S4: <sup>13</sup>C-NMR spectrum of 4-((1H-indol-3-yl)(p-tolyl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6c)

<sup>1</sup>H NMR- Dr. Pourmousavi R14 (R. Rameshini)



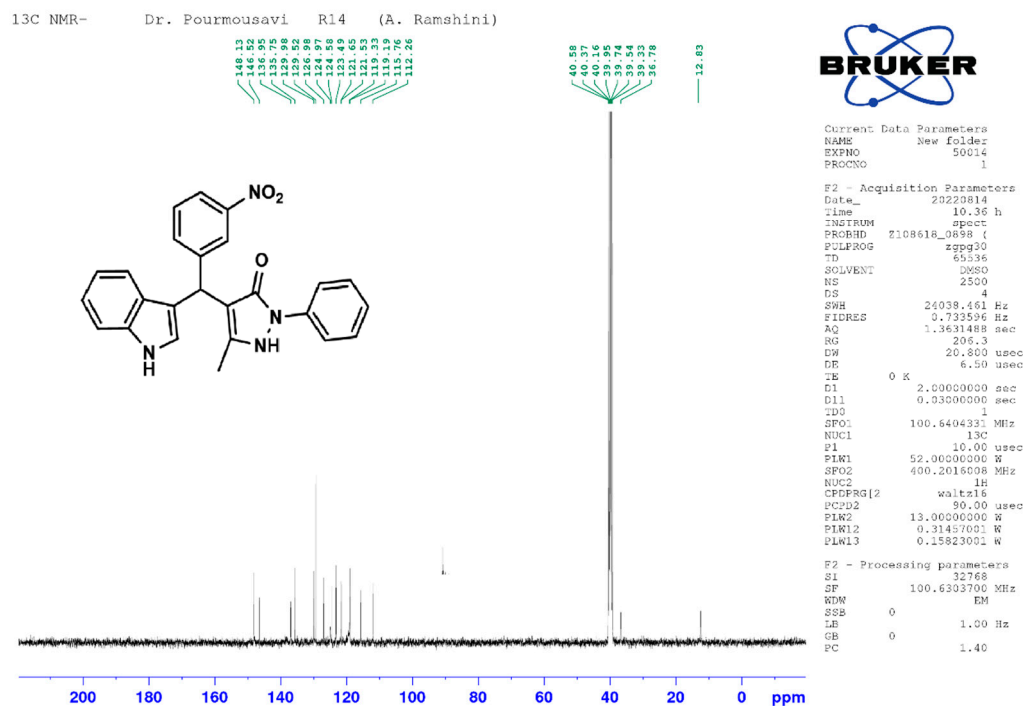
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DE 6.50 usec  
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F2 - Processing parameters  
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**Figure S5:**  $^1\text{H}$ -NMR spectrum of 4-((1H-indol-3-yl)(3-nitrophenyl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6e)



**Figure S6:**  $^{13}\text{C}$ -NMR spectrum of 4-((1H-indol-3-yl)(3-nitrophenyl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6e)

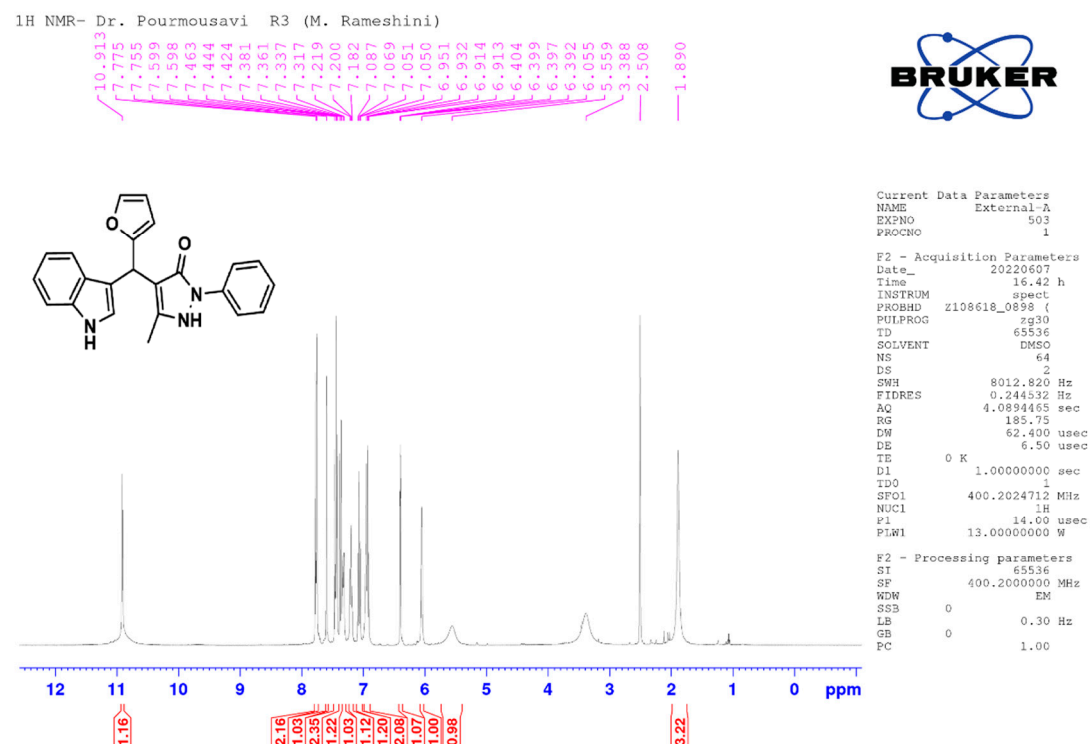


Figure S7:  $^1\text{H}$ -NMR spectrum of 4-(furan-2-yl(1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6i)

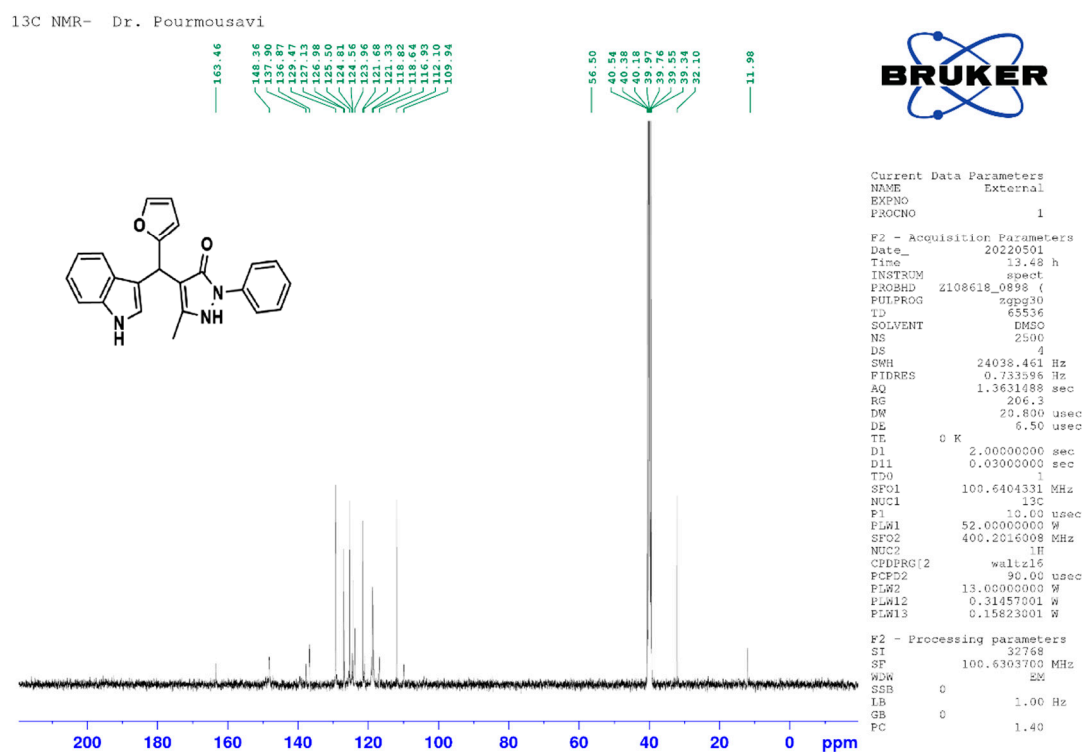
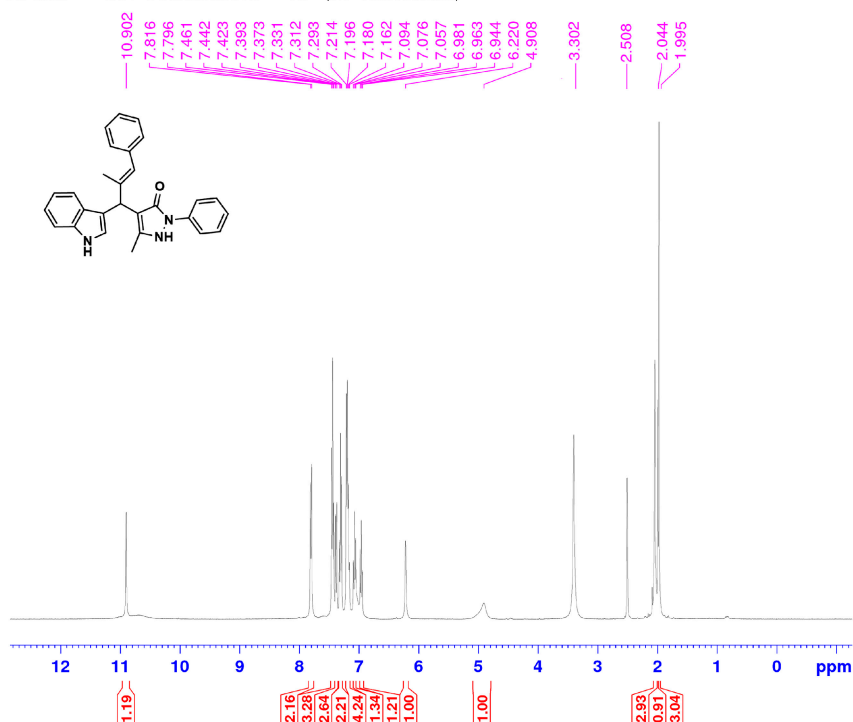


Figure S8:  $^{13}\text{C}$ -NMR spectrum of 4-(furan-2-yl(1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6i)

<sup>1</sup>H NMR- Dr. Pourmousavi R8 (R. Rameshini)

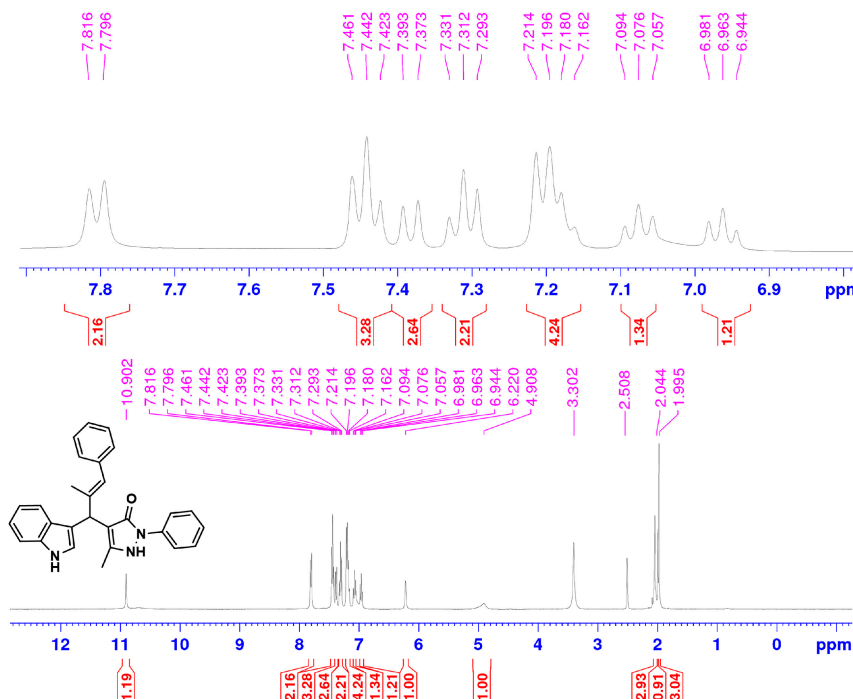


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TD0 1  
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<sup>1</sup>H NMR- Dr. Pourmousavi R8 (R. Rameshini)



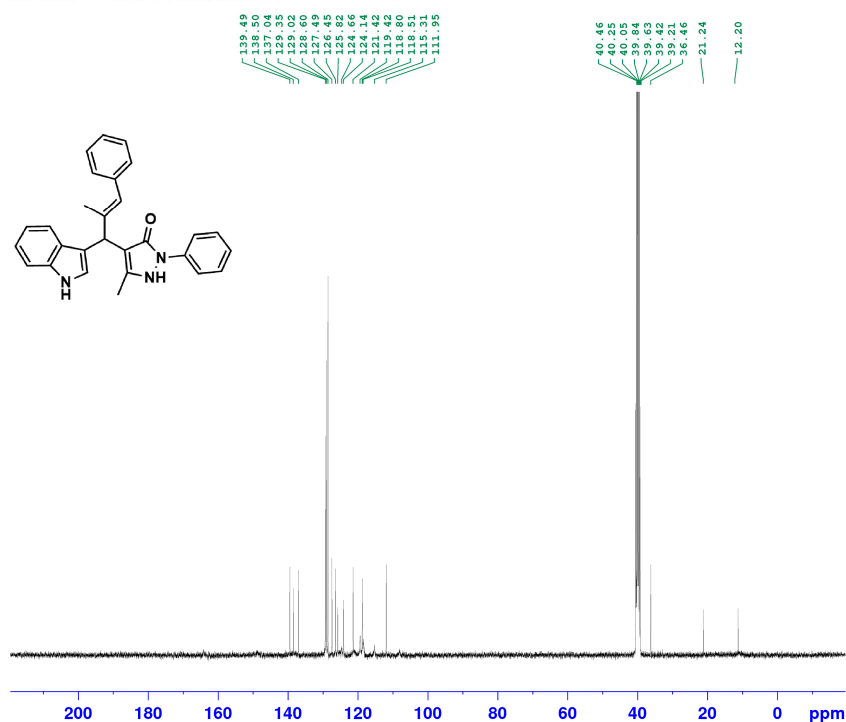
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SOLVENT DMSO  
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DS 2  
SWH 8012.820 Hz  
FIDRES 0.244532 Hz  
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RG 103.76  
DW 62.400 usec  
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Figure S9: <sup>1</sup>H-NMR spectrum of 4-(1-(1H-indol-3-yl)-2-methyl-3-phenylallyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6l)

<sup>13</sup>C NMR- Dr. Pourmousavi (A. Ramshini)



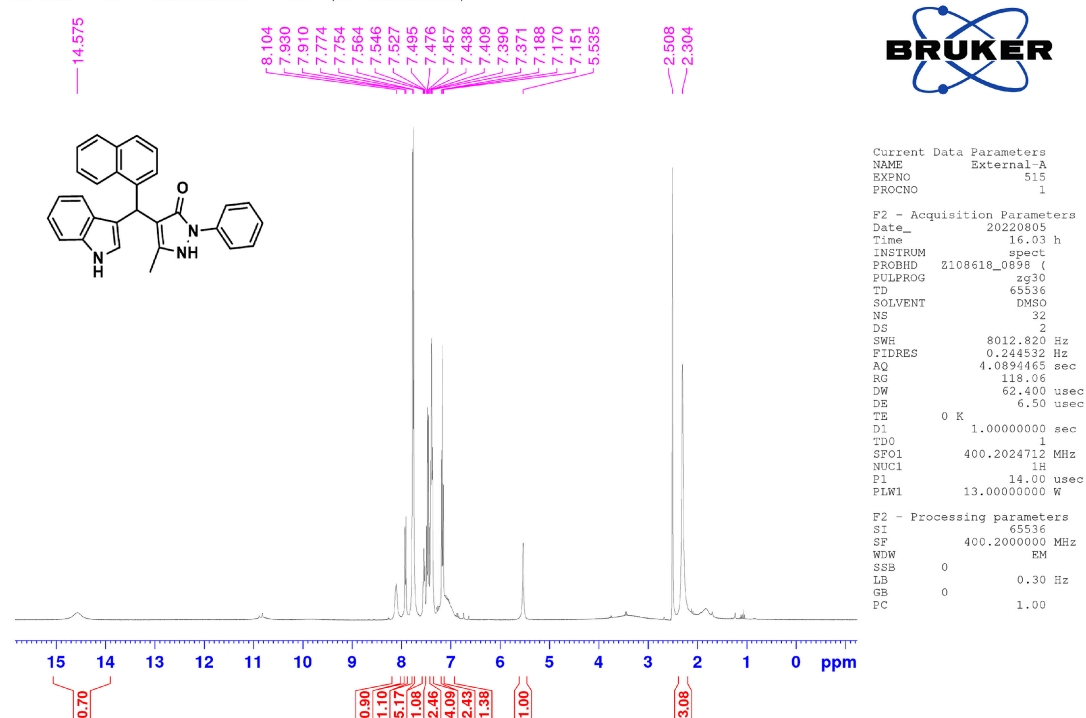
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TE 0 K  
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D11 0.03000000 sec  
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SFO1 100.6404331 MHz  
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P1 10.00 usec  
PLW1 52.00000000 W  
SFO2 400.2016008 MHz  
NUC2 1H  
CPDPRG12 waltz16  
PCPD2 90.00 usec  
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**Figure S10:** <sup>13</sup>C-NMR spectrum of 4-(1-(1H-indol-3-yl)-2-methyl-3-phenylallyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6l)

<sup>1</sup>H NMR- Dr. Pourmousavi R15 (R. Rameshini)



<sup>1</sup>H NMR- Dr. Pourmousavi R15 (R. Rameshini)

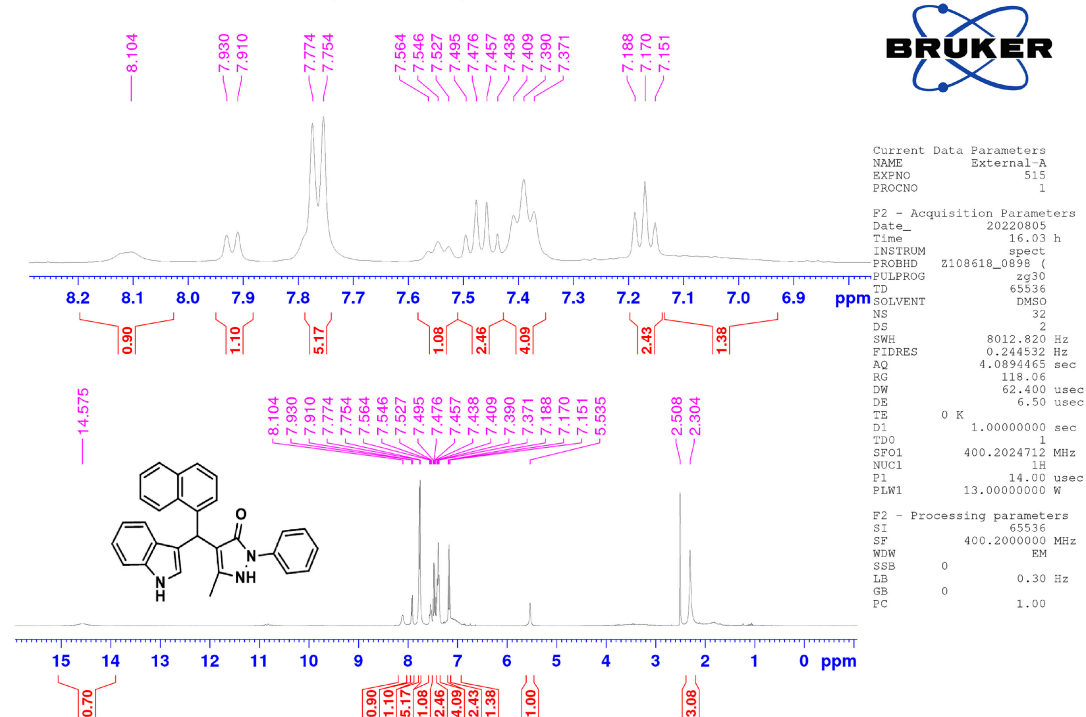
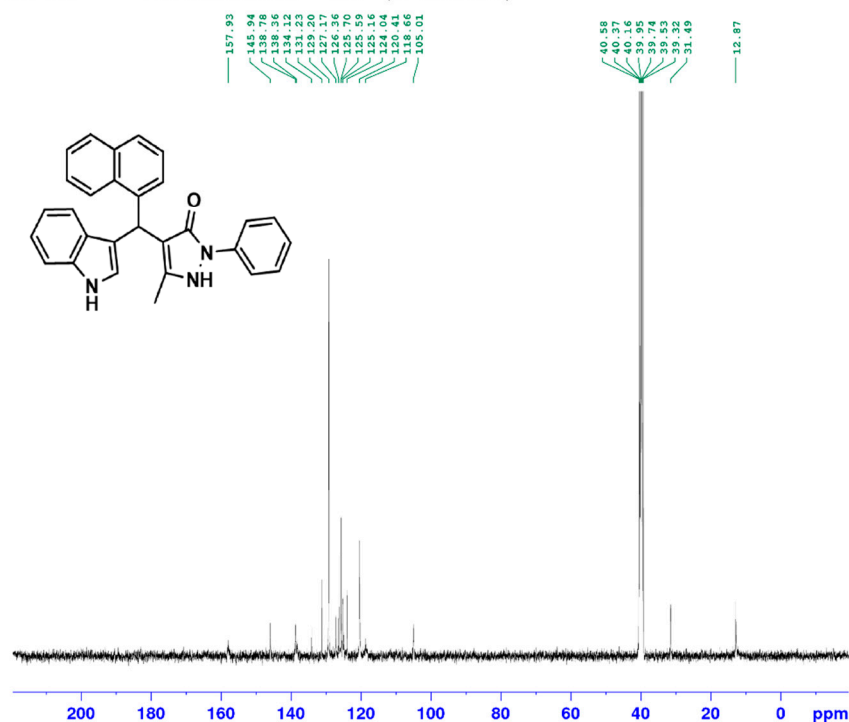


Figure S11: <sup>1</sup>H-NMR spectrum of 4-((1H-indol-3-yl)(naphthalen-1-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6m)

<sup>13</sup>C NMR- Dr. Pourmousavi R15 (A. Ramshini)



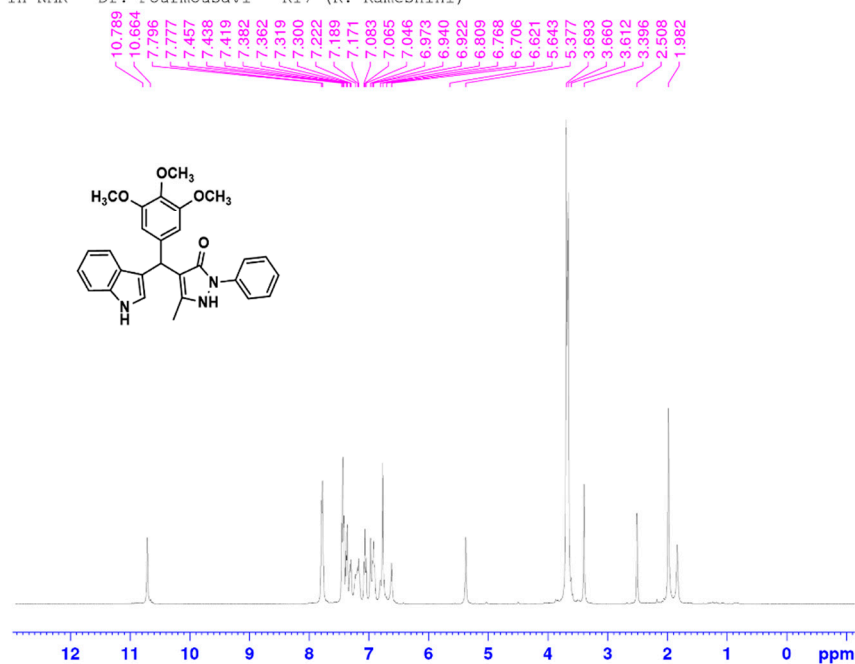
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NUC2 1H  
CPDPRG12 waltz16  
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PLW12 0.31457001 W  
PLW13 0.15823001 W

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WDW EM  
SSB 0  
LB 1.00 Hz  
GB 0  
PC 1.40

**Figure S12:** <sup>13</sup>C-NMR spectrum of 4-((1H-indol-3-yl)(naphthalen-1-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6m)

<sup>1</sup>H NMR- Dr. Pourmousavi R17 (R. Rameshini)

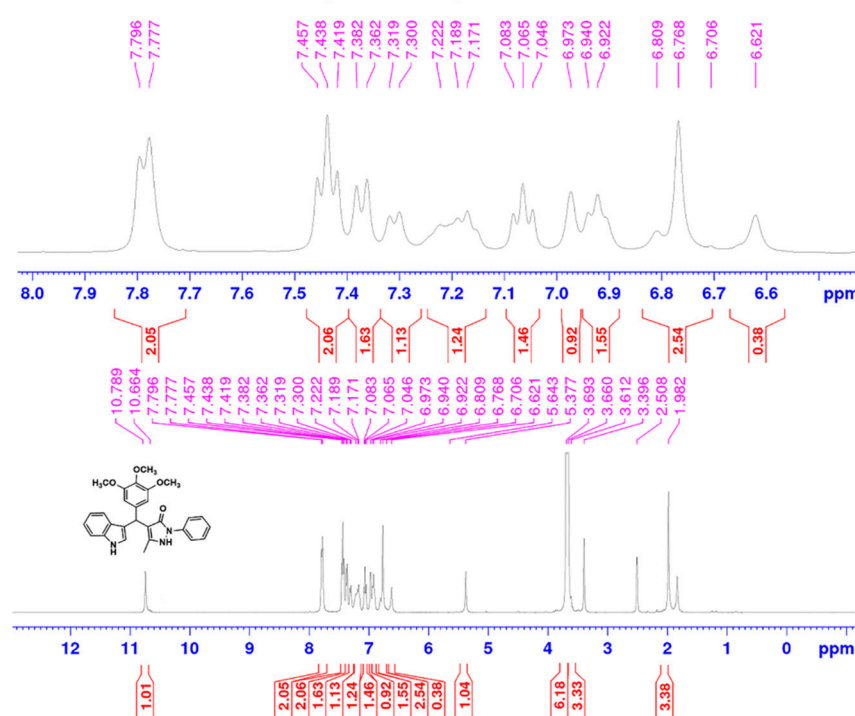


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FIDRES 0.244532 Hz  
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<sup>1</sup>H NMR- Dr. Pourmousavi R17 (R. Rameshini)



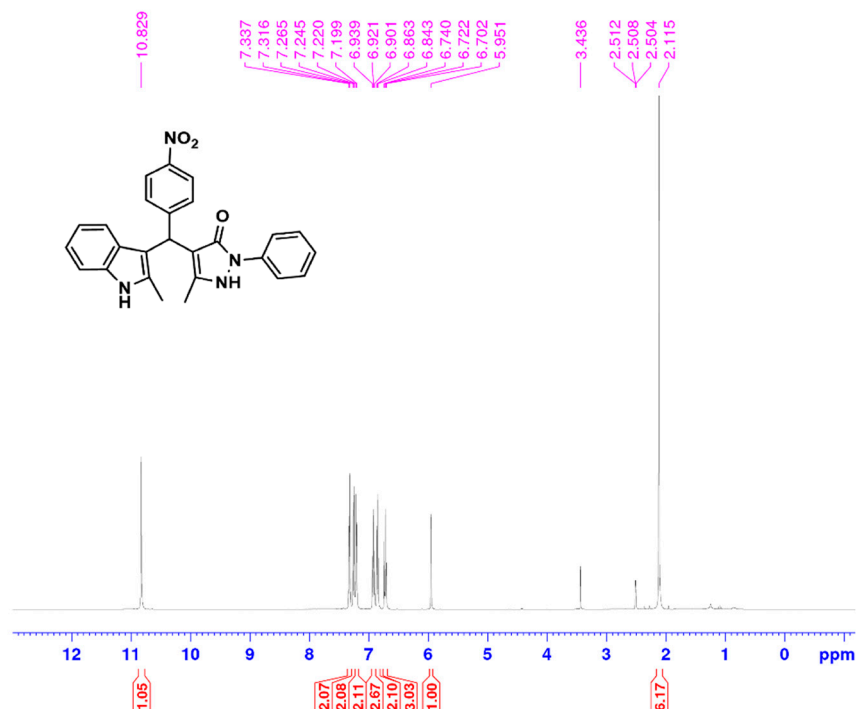
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**Figure S13:** <sup>1</sup>H-NMR spectrum of 4-((1H-indol-3-yl)(3,4,5-trimethoxyphenyl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6n)

<sup>1</sup>H NMR- Dr. Pourmousavi R11 (R. Rameshini)

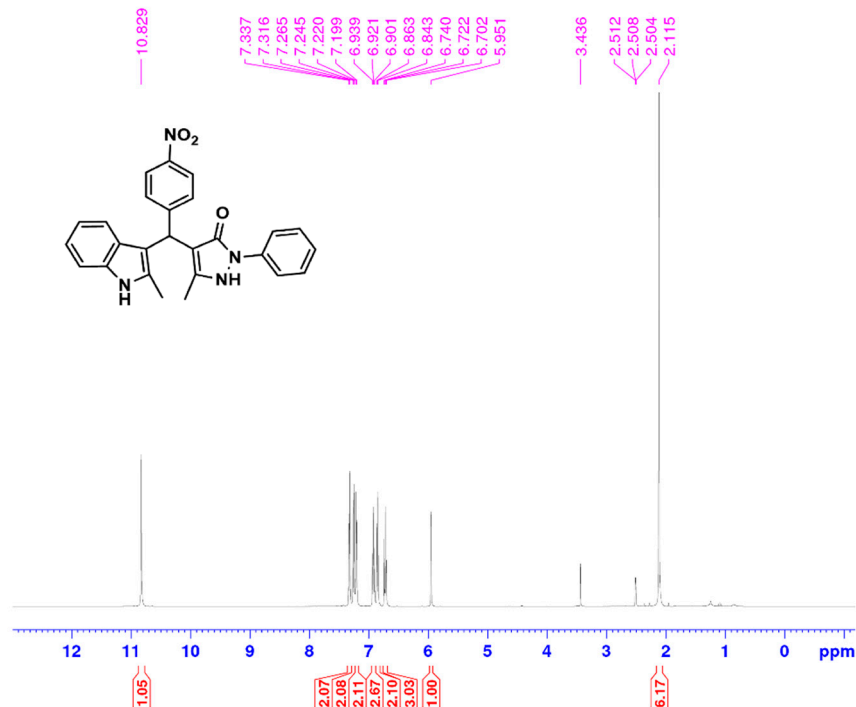


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<sup>1</sup>H NMR- Dr. Pourmousavi R11 (R. Rameshini)



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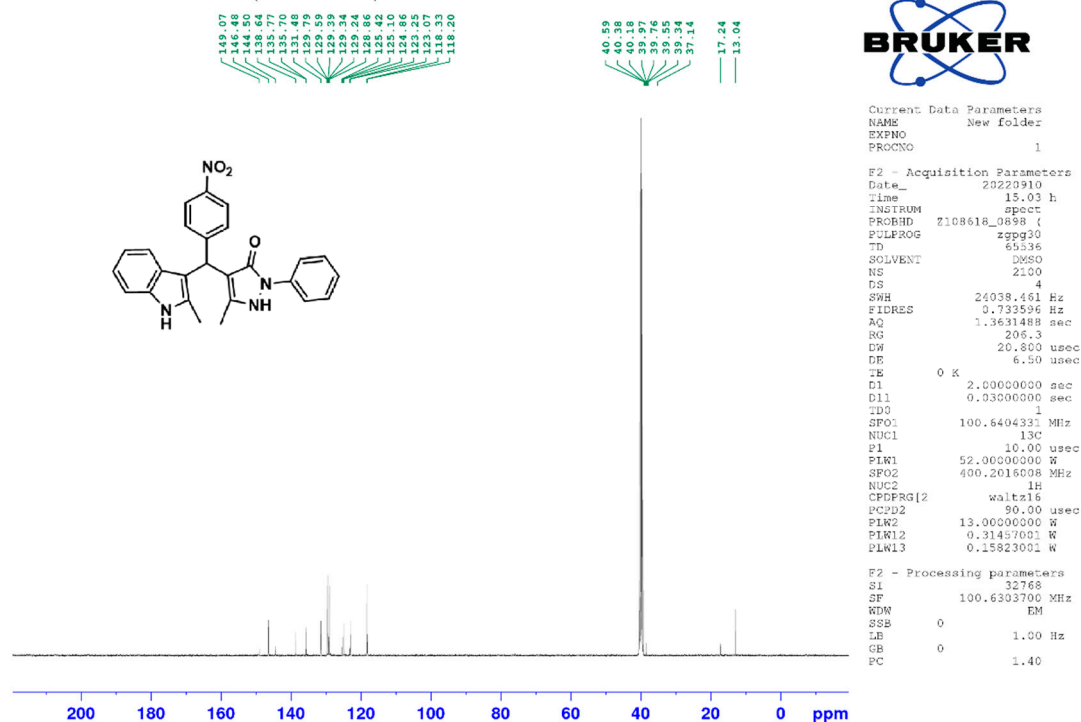
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**Figure S14:** <sup>1</sup>H-NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(4-nitrophenyl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6q)

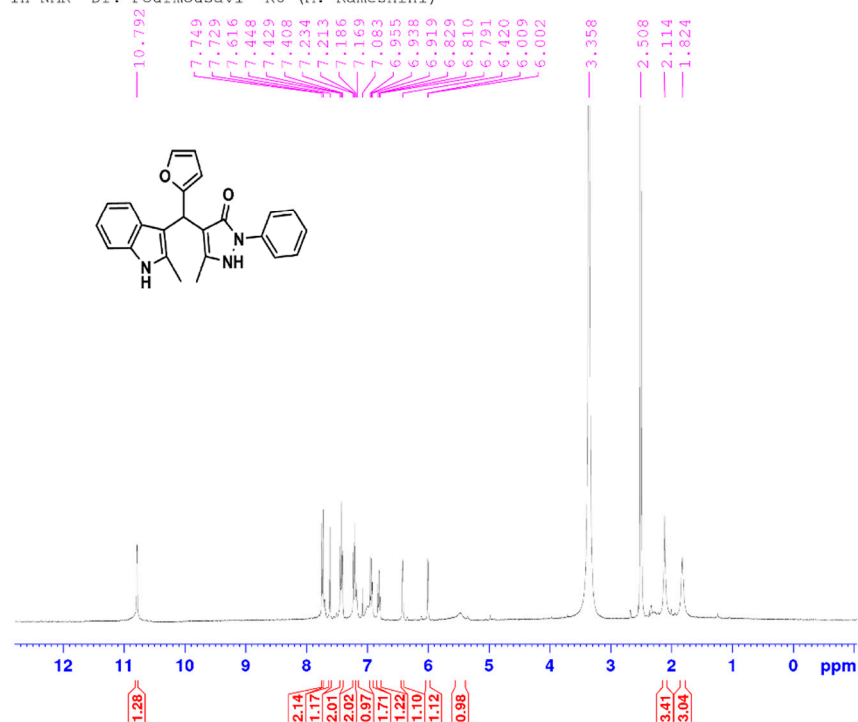


<sup>13</sup>C NMR- Dr. Pourmousavi (A. Ramshini)



**Figure S15:** <sup>13</sup>C-NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(4-nitrophenyl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6q)

<sup>1</sup>H NMR- Dr. Pourmousavi R6 (M. Rameshini)

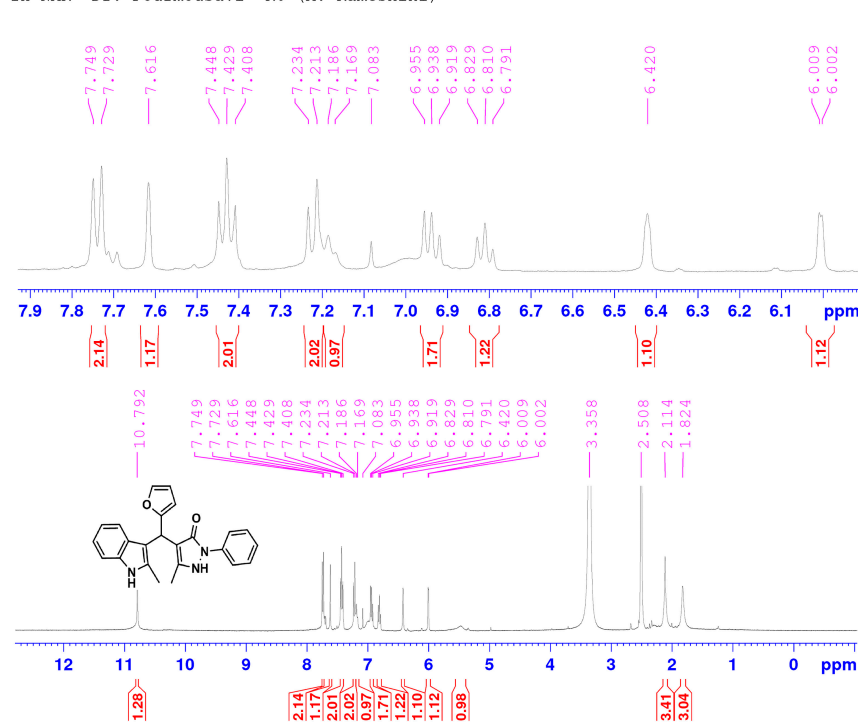


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RG 206.3  
DW 62.400 usec  
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PLW1 13.00000000 W

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<sup>1</sup>H NMR- Dr. Pourmousavi R6 (M. Rameshini)



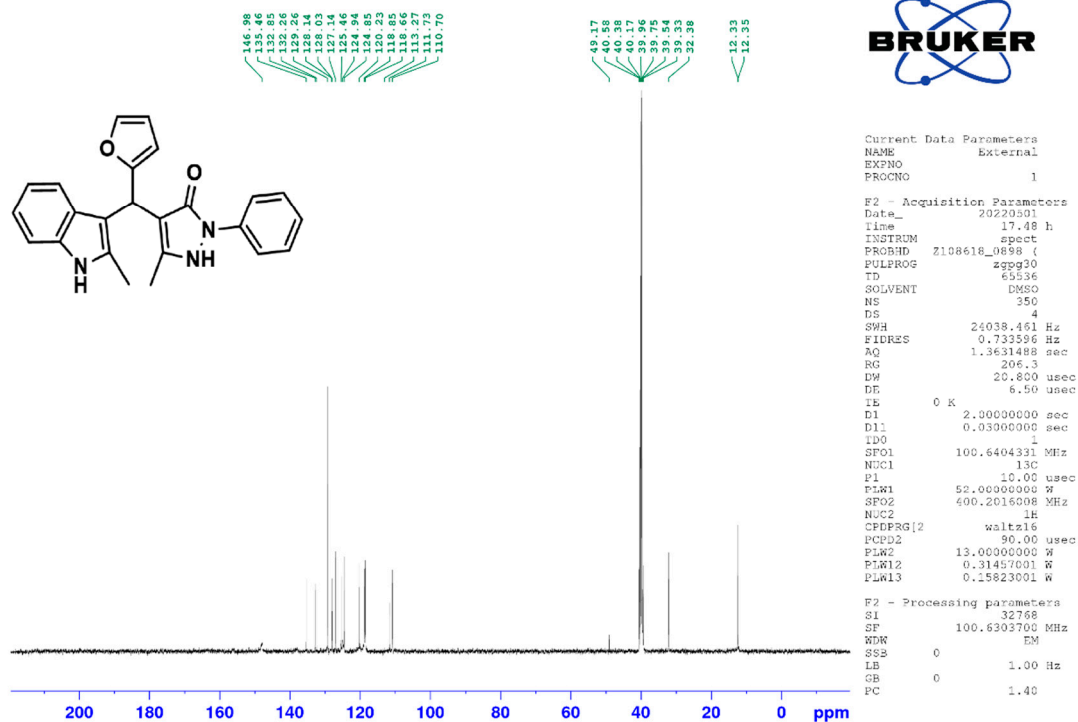
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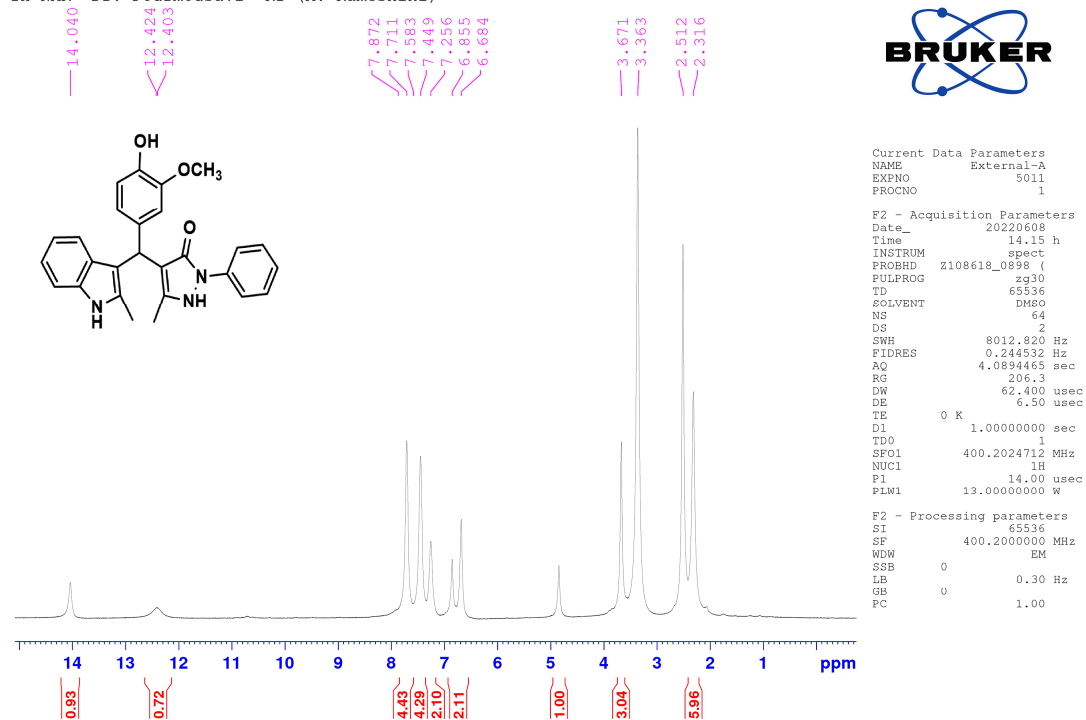
**Figure S16:** <sup>1</sup>H-NMR spectrum of 4-(furan-2-yl(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6r)

<sup>13</sup>C NMR- Dr. Pourmousavi



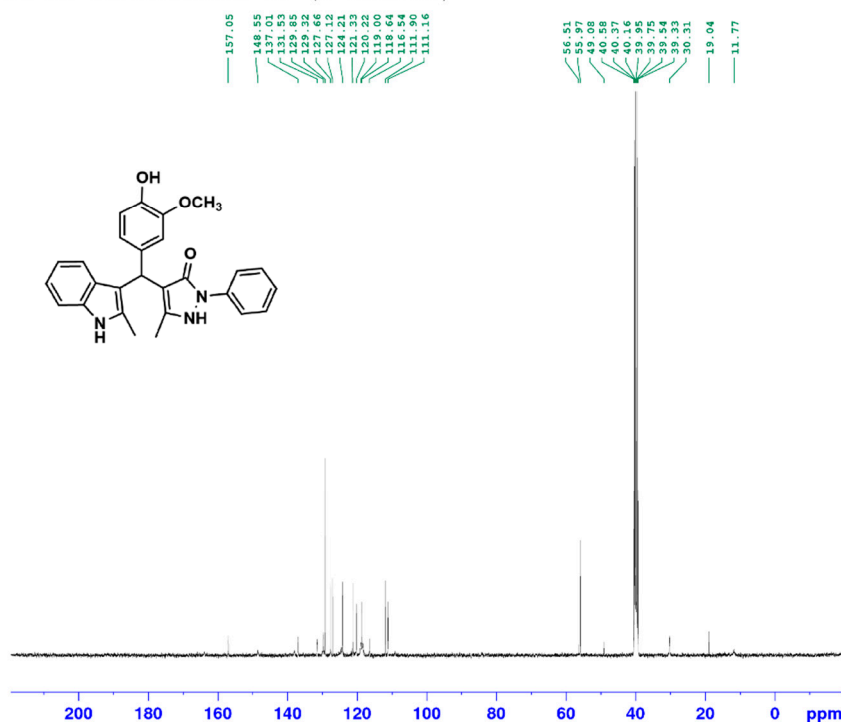
**Figure S17:** <sup>13</sup>C-NMR spectrum of 4-(furan-2-yl(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(**6r**)

<sup>1</sup>H NMR- Dr. Pourmousavi R1 (M. Rameshini)



**Figure S18:** <sup>1</sup>H-NMR spectrum of 4-((4-hydroxy-3-methoxyphenyl)(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6t)

<sup>13</sup>C NMR- Dr. Pourmousavi R4 (M. Rameshini)



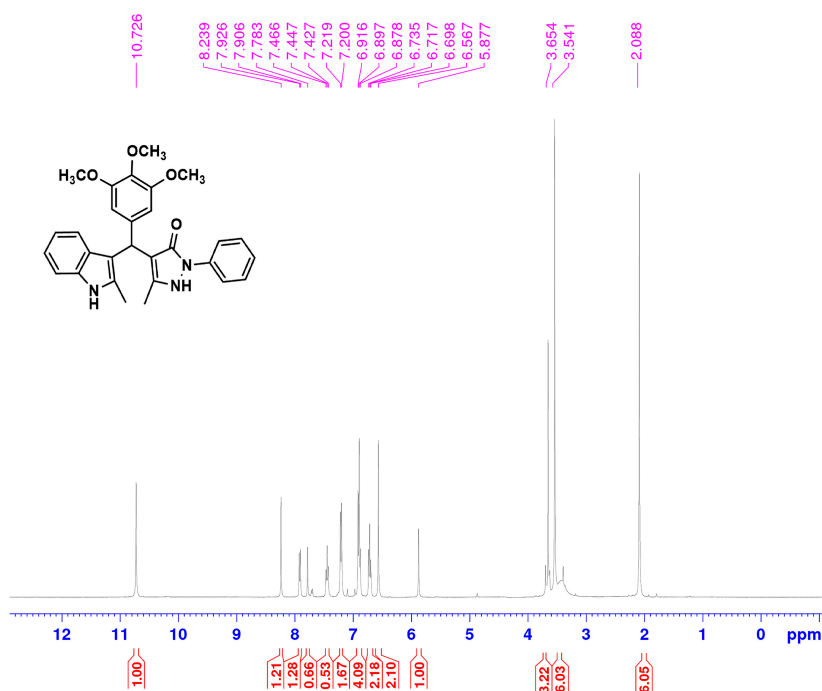
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Figure S19: <sup>13</sup>C-NMR spectrum of 4-((4-hydroxy-3-methoxyphenyl)(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6t)

<sup>1</sup>H NMR- Dr. Pourmousavi R21 (A. Ramshini)

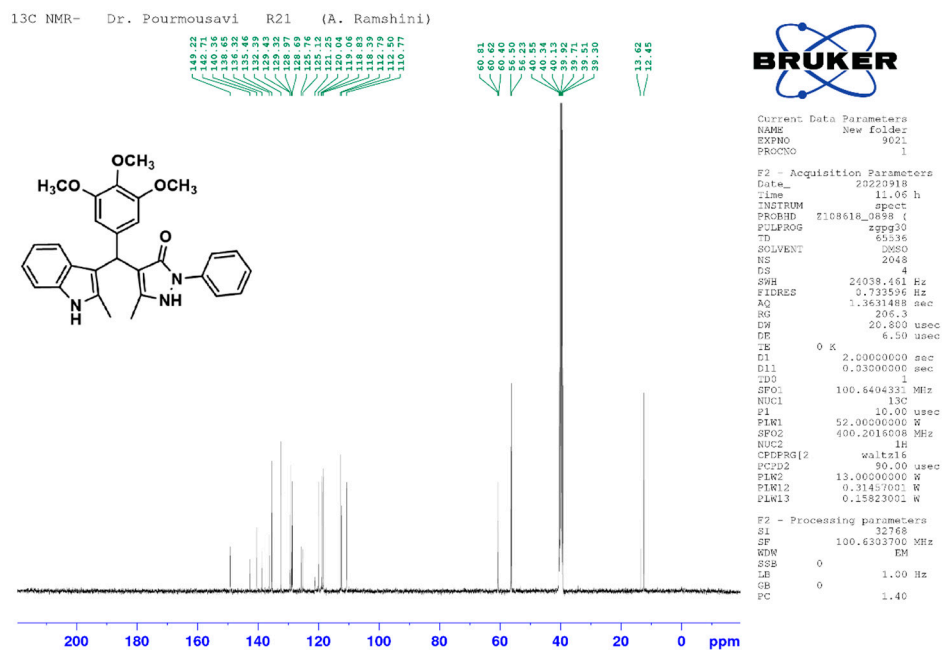


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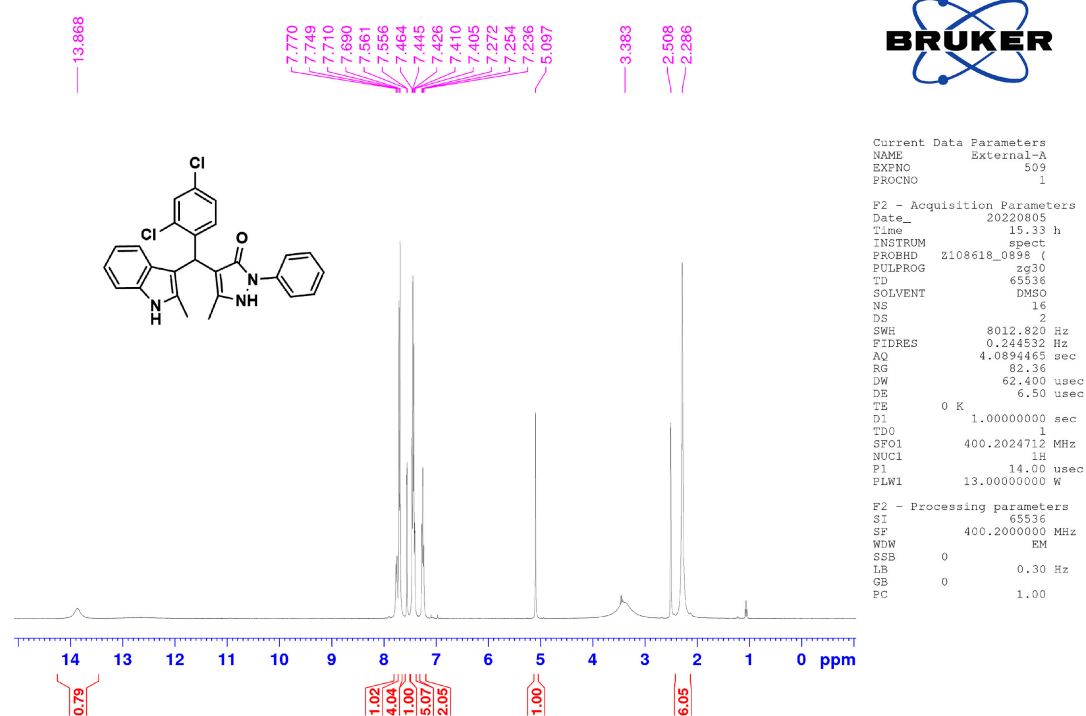
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**Figure S20:**  $^1\text{H}$ -NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(3,4,5-trimethoxyphenyl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (**6u**)



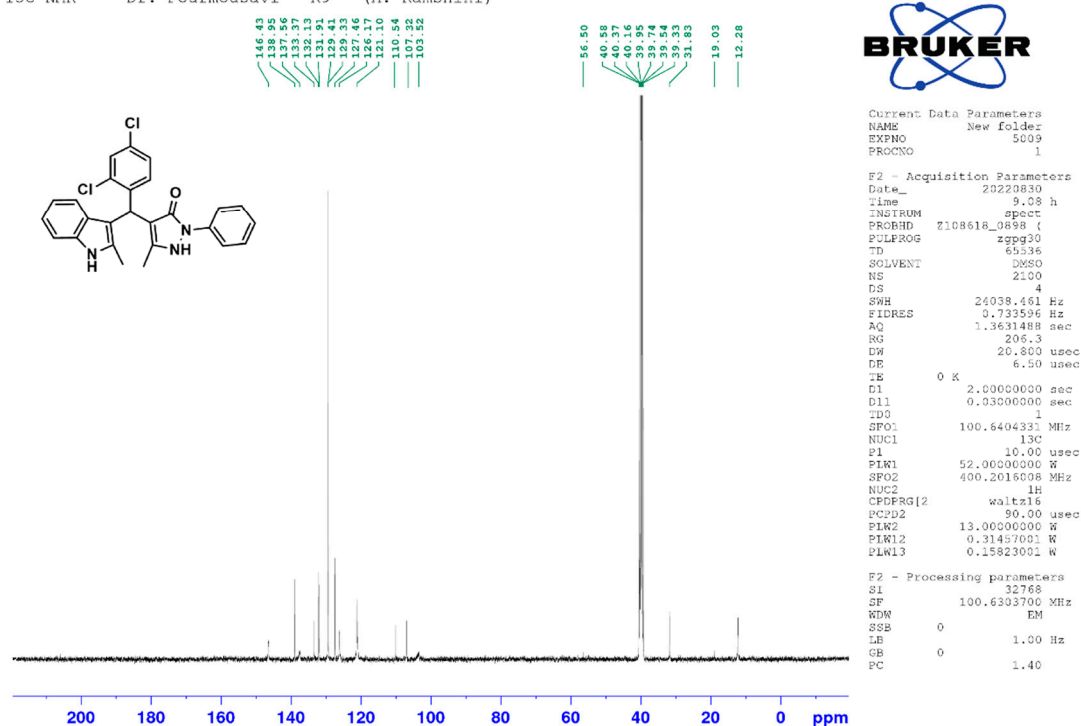
**Figure S21:**  $^{13}\text{C}$ -NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(3,4,5-trimethoxyphenyl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (**6u**)

<sup>1</sup>H NMR- Dr. Pourmousavi R9 (R. Rameshini)



**Figure S22:** <sup>1</sup>H-NMR spectrum of 4-((2,4-dichlorophenyl)(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6v)

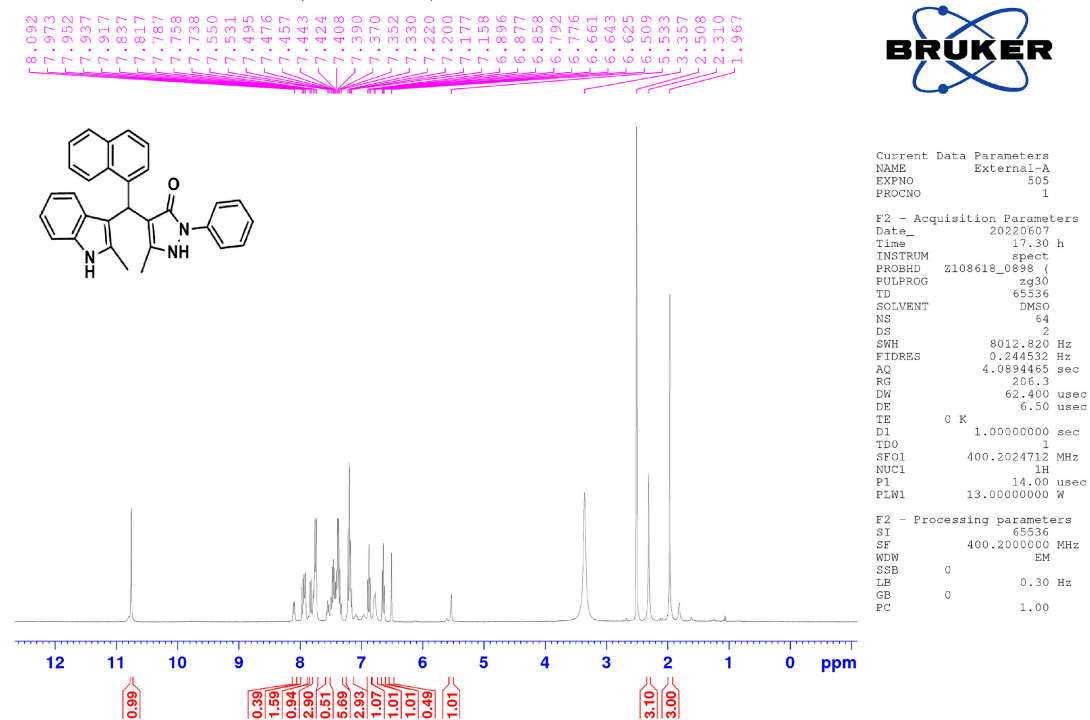
<sup>13</sup>C NMR- Dr. Pourmousavi R9 (A. Ramshini)



**Figure S23:** <sup>13</sup>C-NMR spectrum of 4-((2,4-dichlorophenyl)(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (6v)



<sup>1</sup>H NMR- Dr. Pourmousavi R5 (M. Rameshini)



**Figure S24:** <sup>1</sup>H-NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(naphthalen-1-yl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6w)

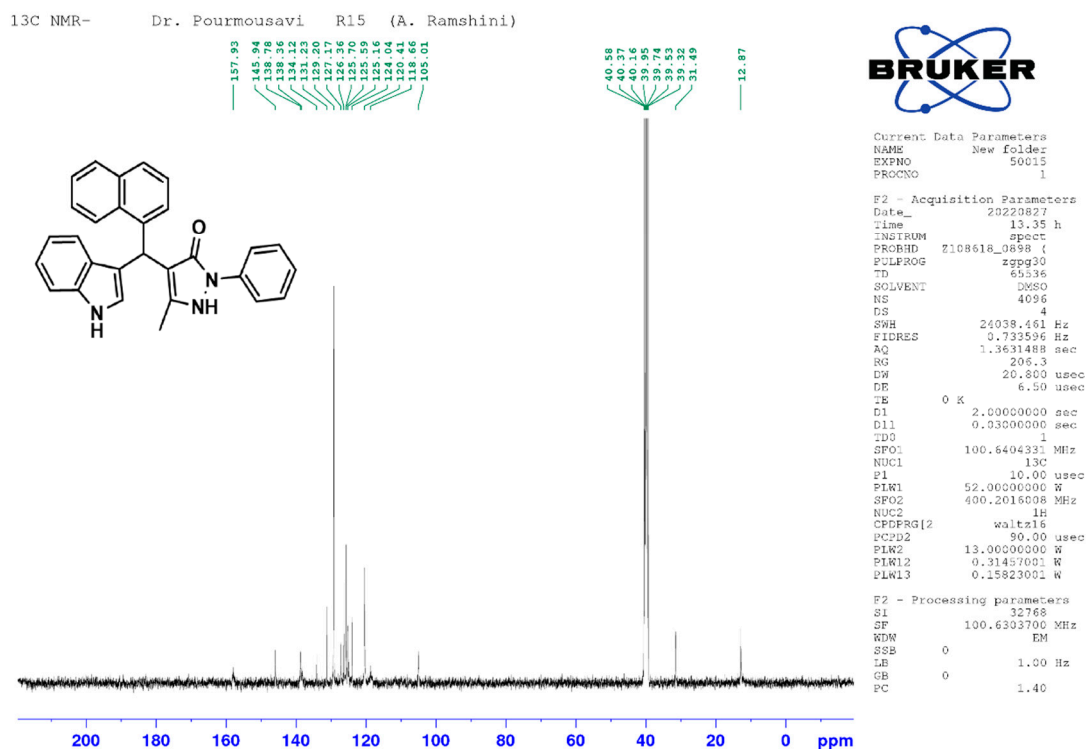
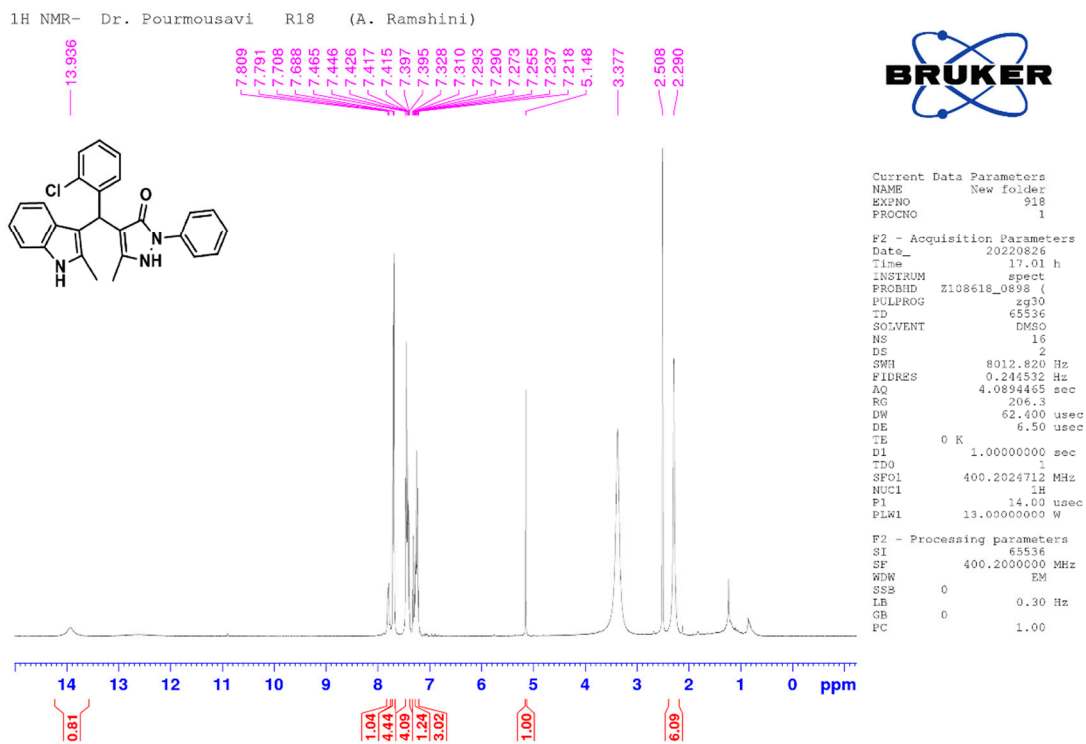


Figure S25: <sup>13</sup>C-NMR spectrum of 5-methyl-4-((2-methyl-1H-indol-3-yl)(naphthalen-1-yl)methyl)-2-phenyl-1,2-dihydro-3H-pyrazol-3-one(6w)



**Figure S27:**  $^{13}\text{C}$ -NMR spectrum of: 4-((2-chlorophenyl)(2-methyl-1H-indol-3-yl)methyl)-5-methyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one (**6x**)

