

**Barium Silicate Nanoparticles, An Efficient Catalyst for One-Pot Green Synthesis of A-Benzyl Amino Coumarin Derivatives as Potential Chemotherapeutic Agents**

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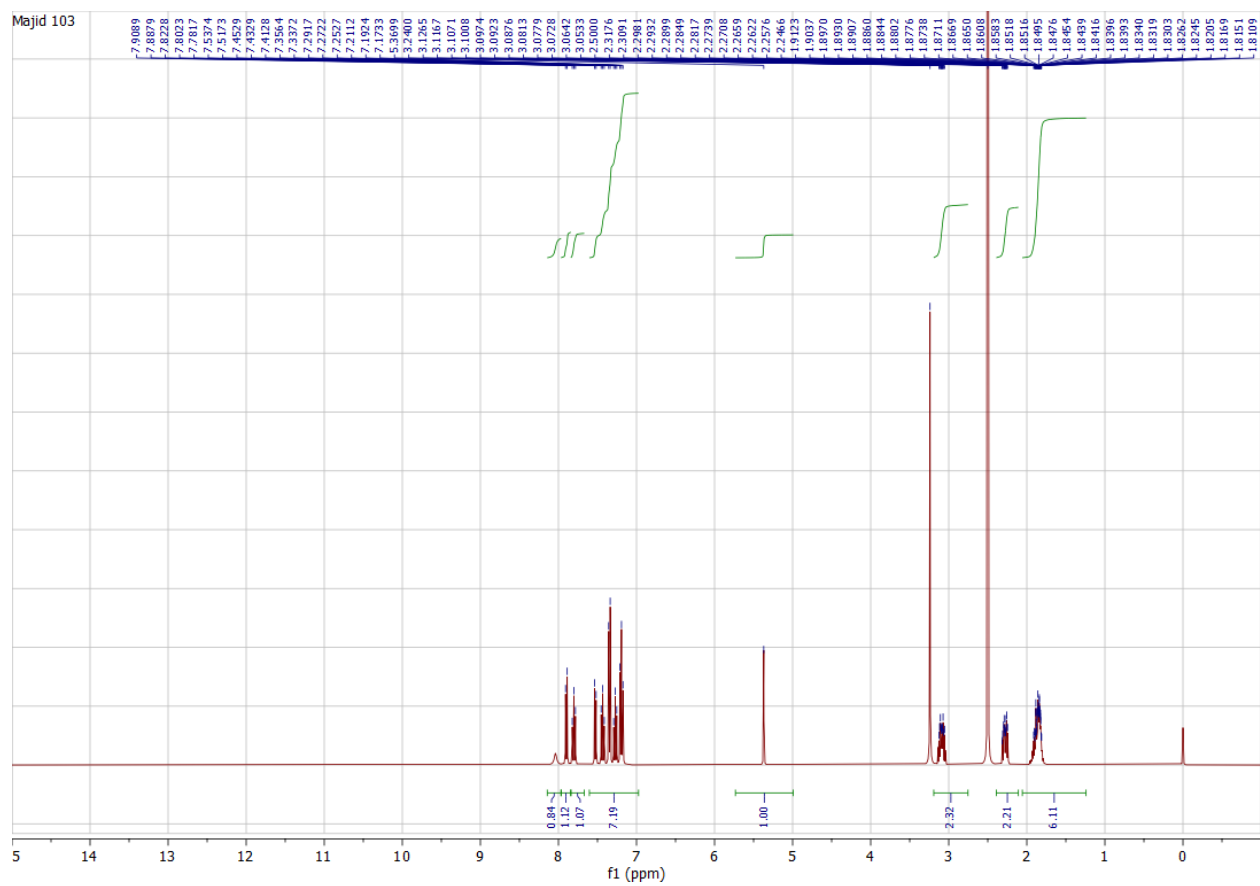
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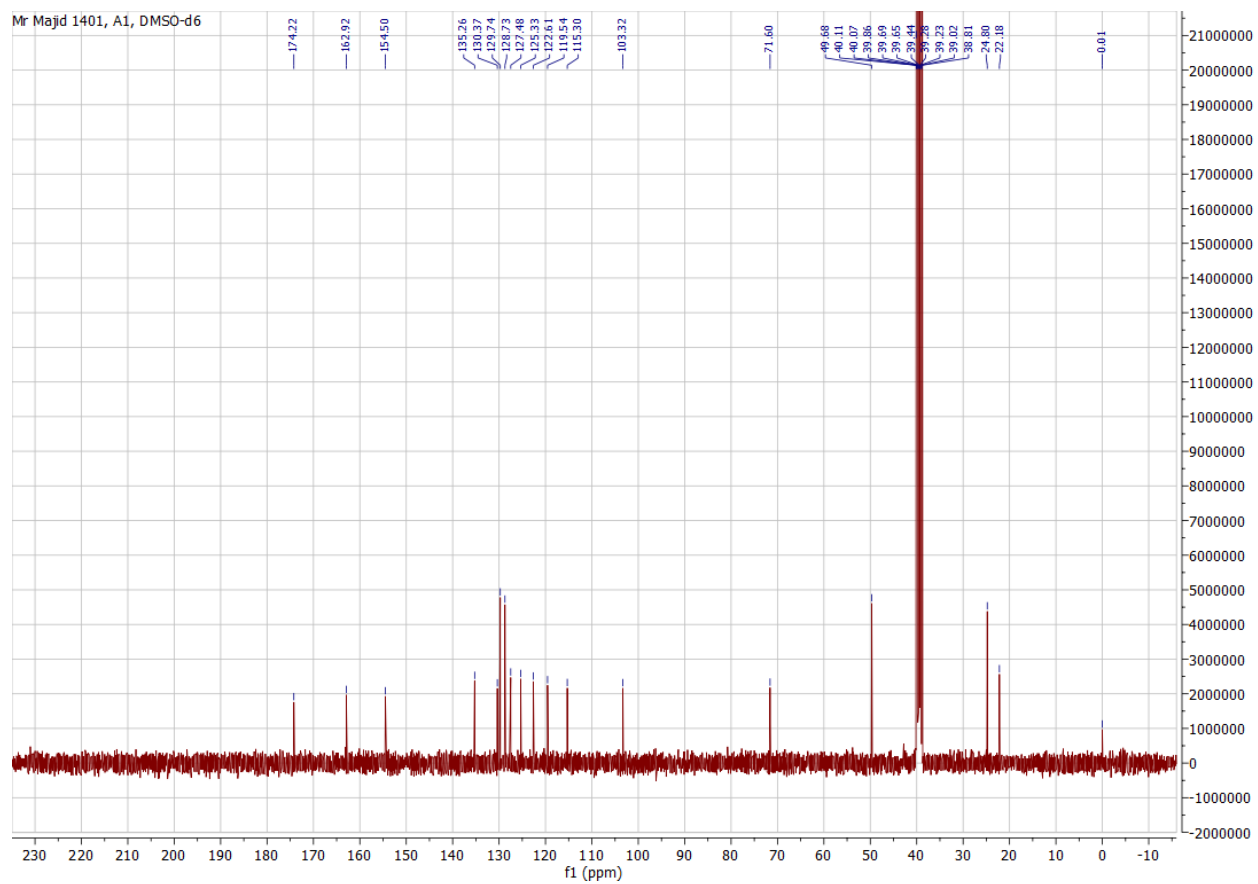
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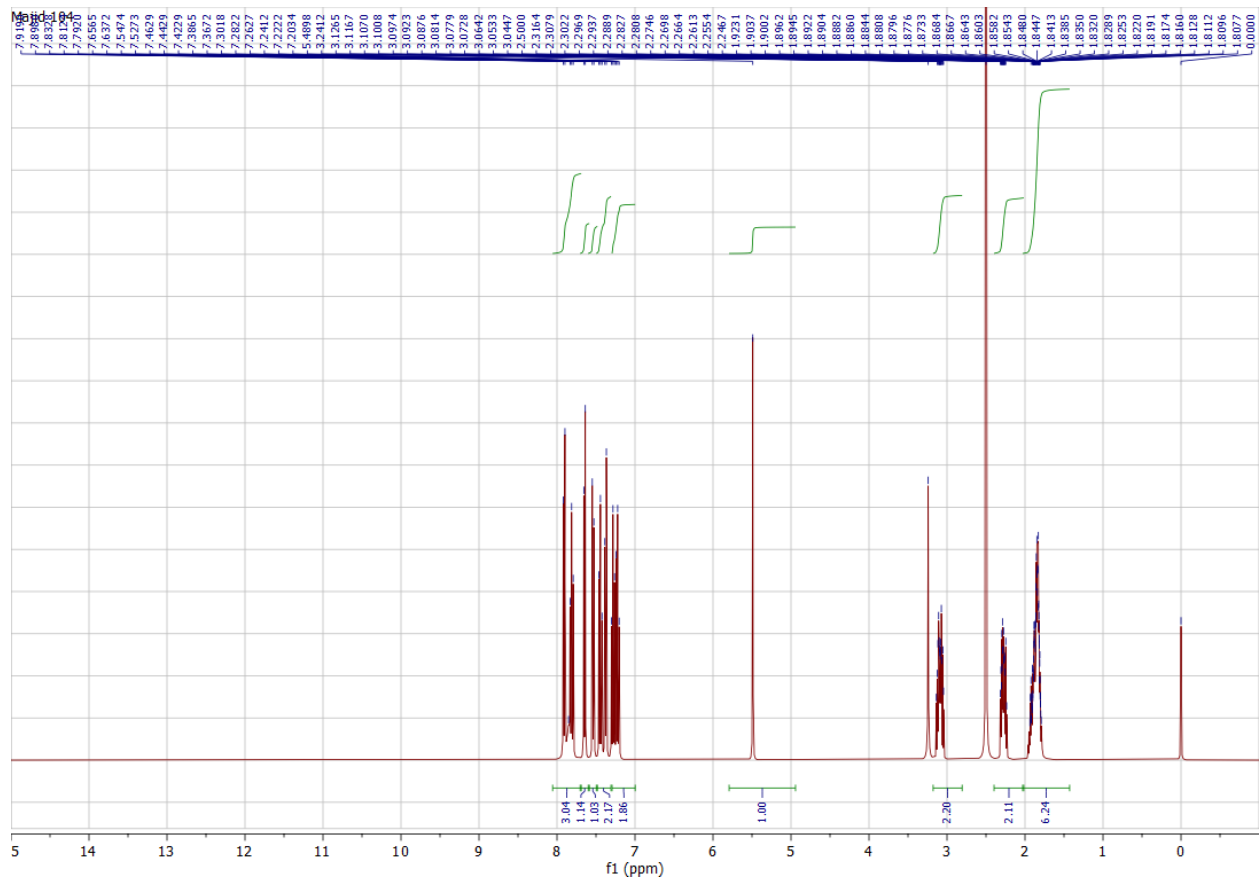
*Majid Ghashang: Tel: +98-3142291004; Fax: +98-3142291016; E-mail: [ghashangmajid@pmt.iaun.ac.ir](mailto:ghashangmajid@pmt.iaun.ac.ir),*



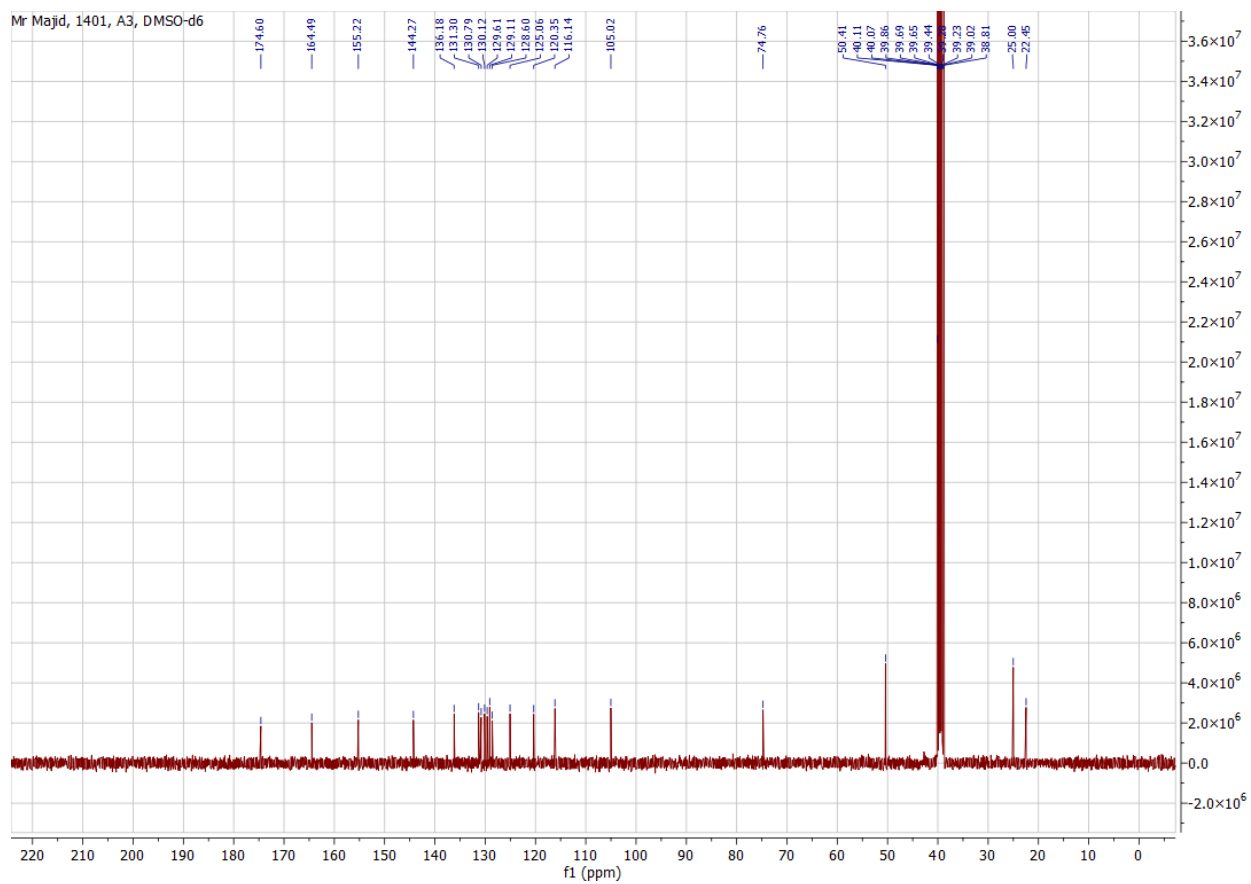
**Figure S<sub>1</sub>:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-(phenyl(piperidin-1-yl) methyl)-2H-chromen-2-one



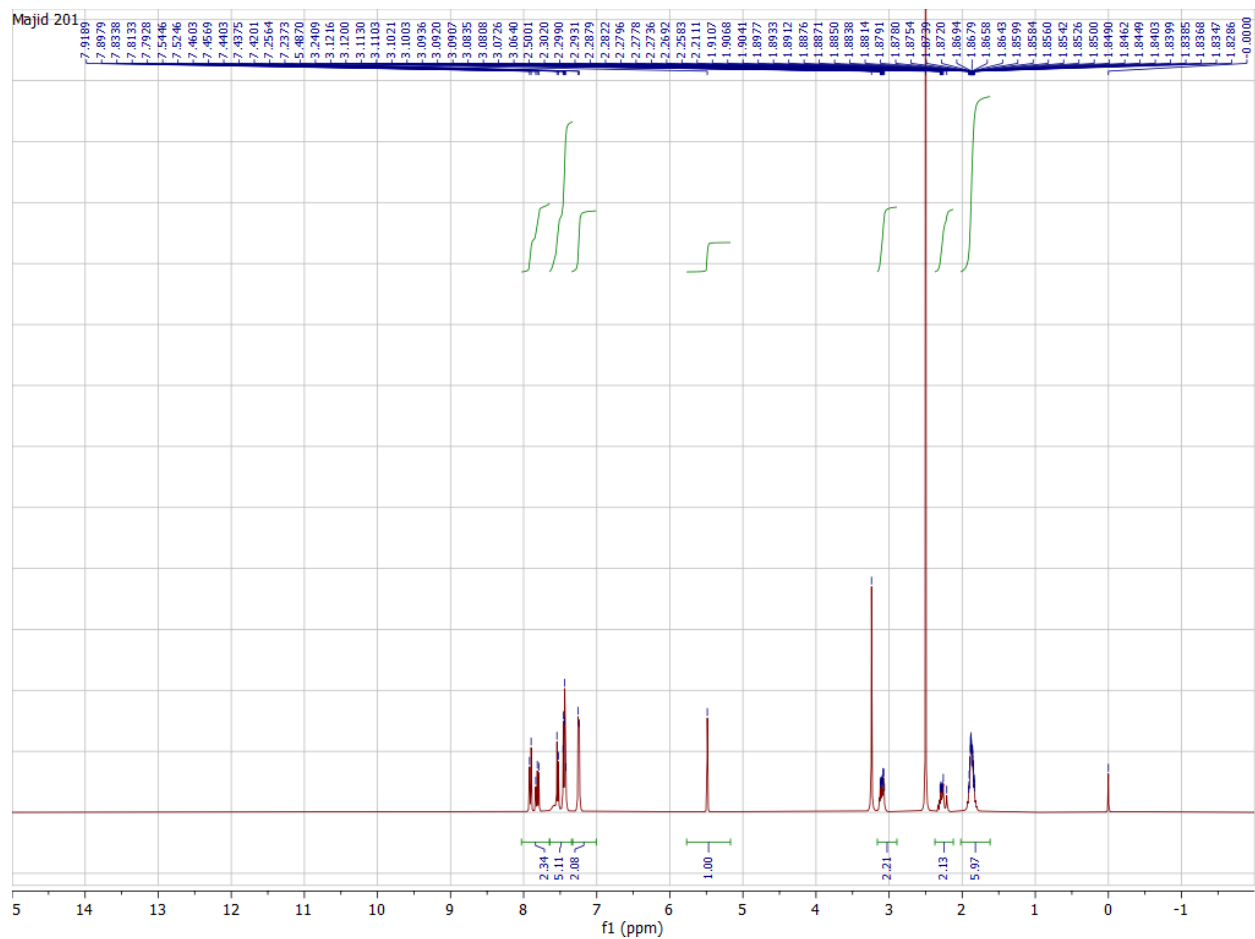
**Figure S<sub>2</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(phenyl(piperidin-1-yl) methyl)-2H-chromen-2-one



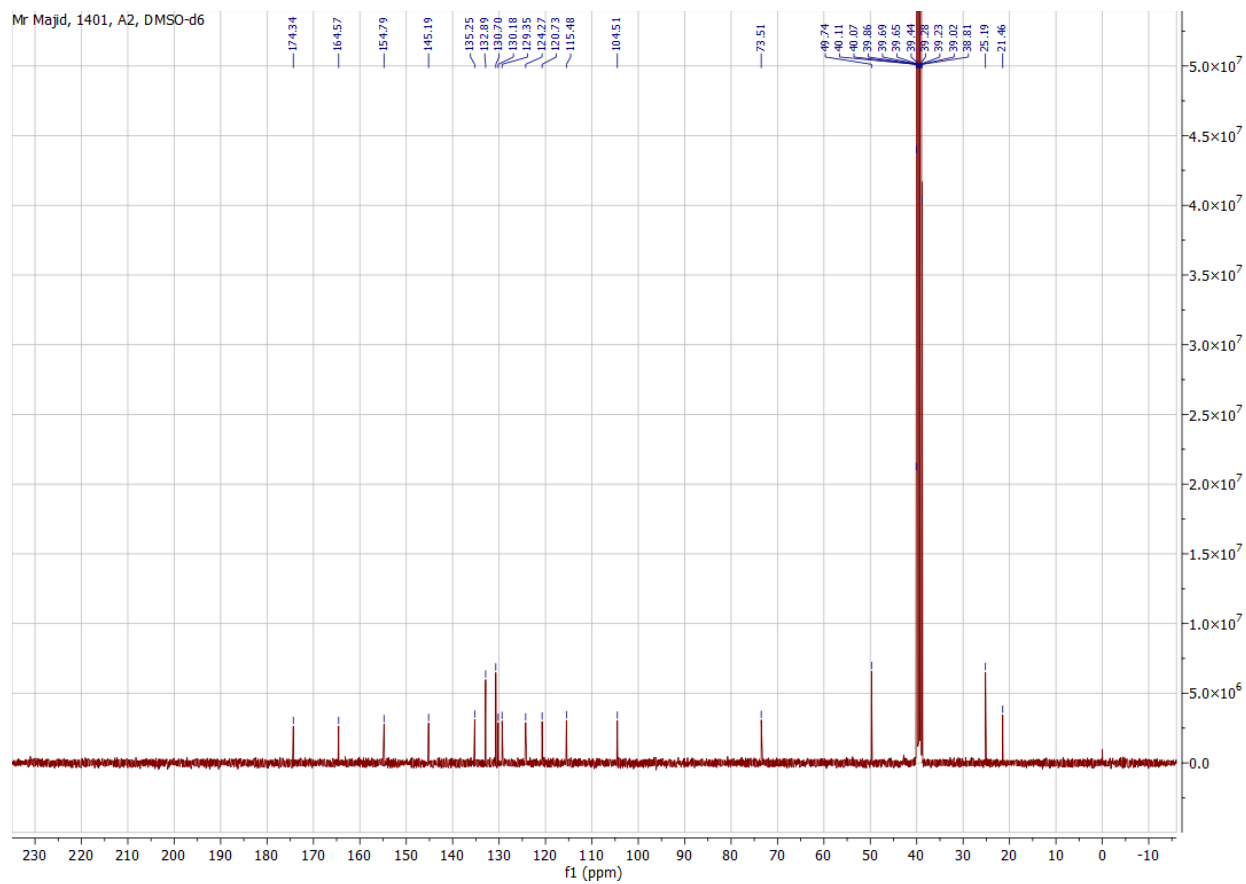
**Figure S<sub>3</sub>:** <sup>1</sup>H-NMR spectra of 3-((2-chlorophenyl) (piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one



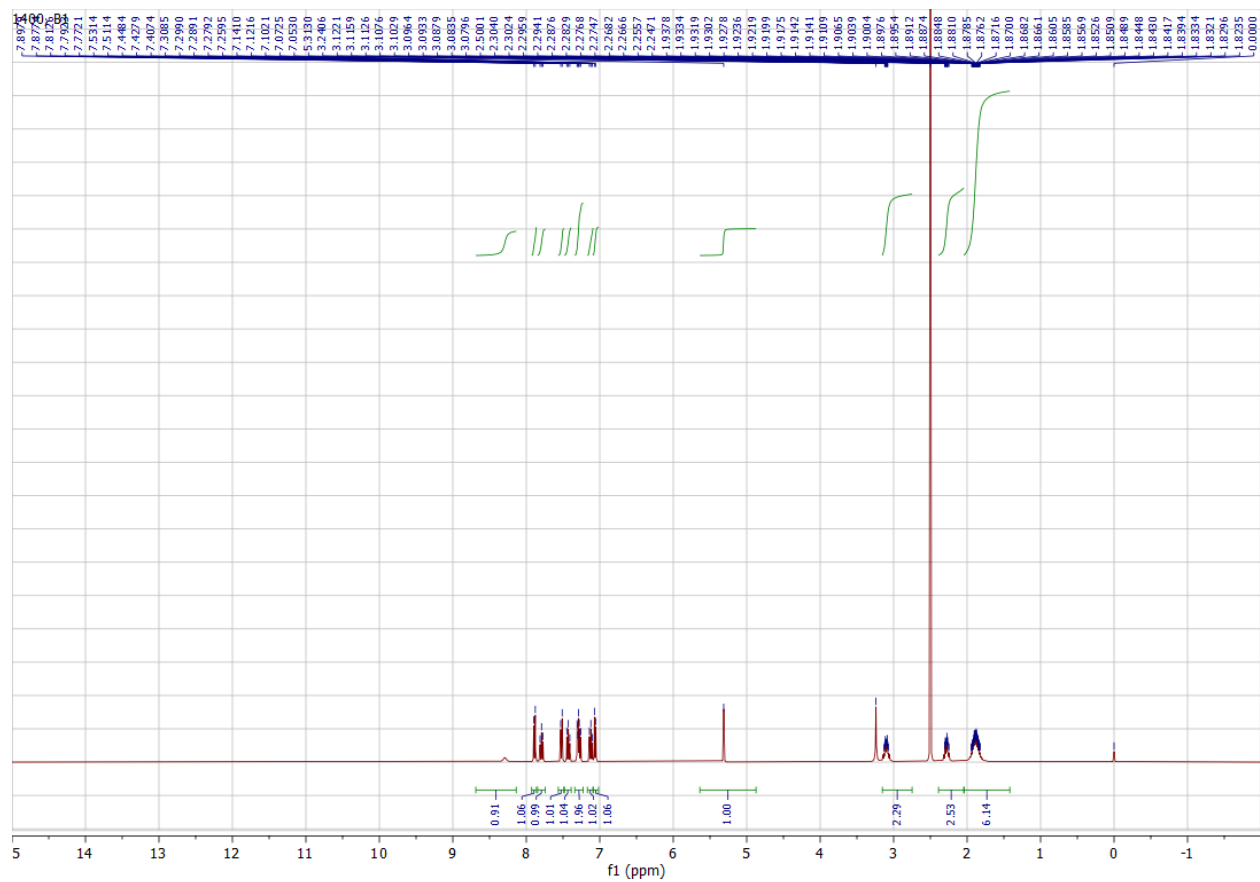
**Figure S4:**  $^{13}\text{C}$ -NMR spectra of 3-((2-chlorophenyl) (piperidin-1-yl) methyl)-4-hydroxy-2H-chromen-2-one



**Figure S<sub>5</sub>:** <sup>1</sup>H-NMR spectra of 3-((4-chlorophenyl) (piperidin-1-yl) methyl)-4-hydroxy-2H-chromen-2-one

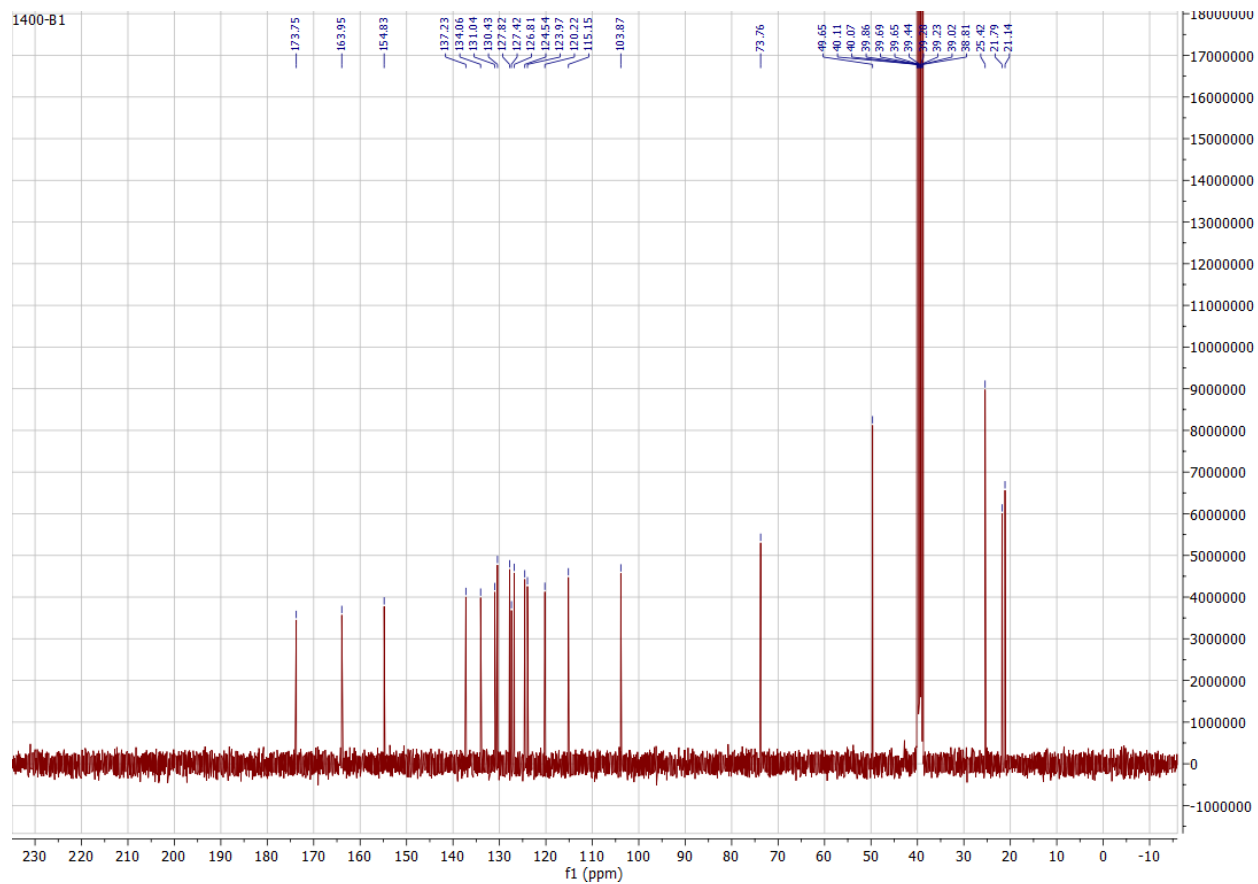


**Figure S<sub>6</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-chlorophenyl) (piperidin-1-yl) methyl)-4-hydroxy-2H-chromen-2-one

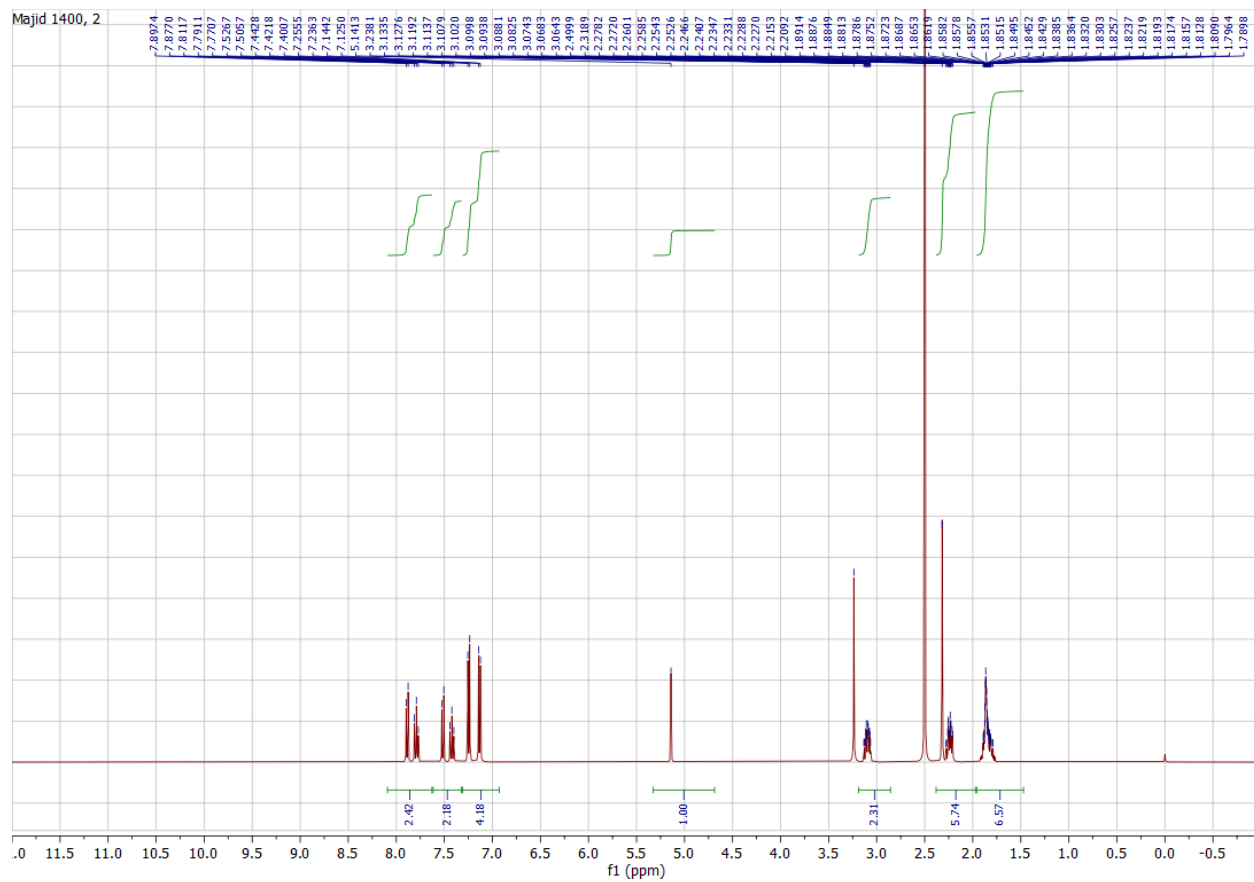


**Figure S7:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-(piperidin-1-yl(o-tolyl) methyl)-2H-chromen-2-one

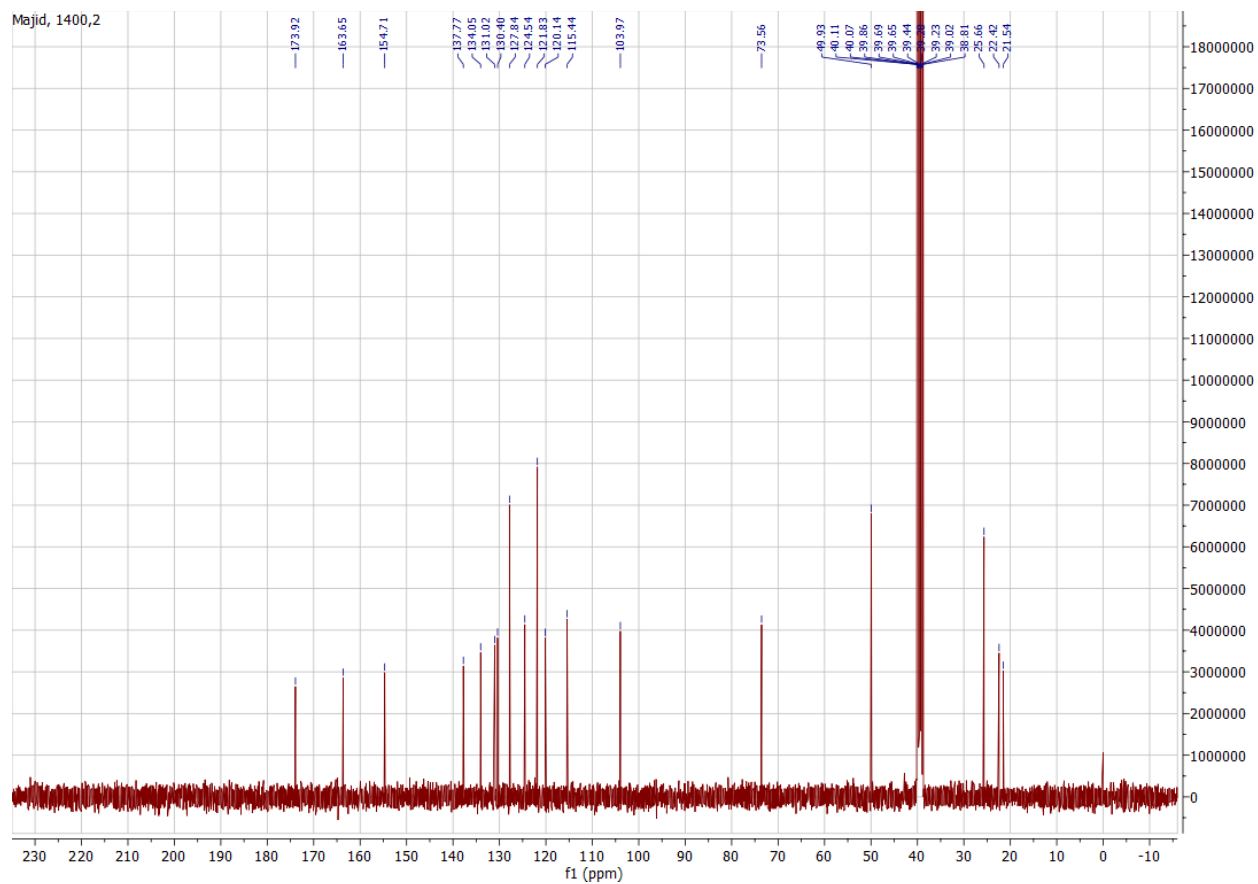




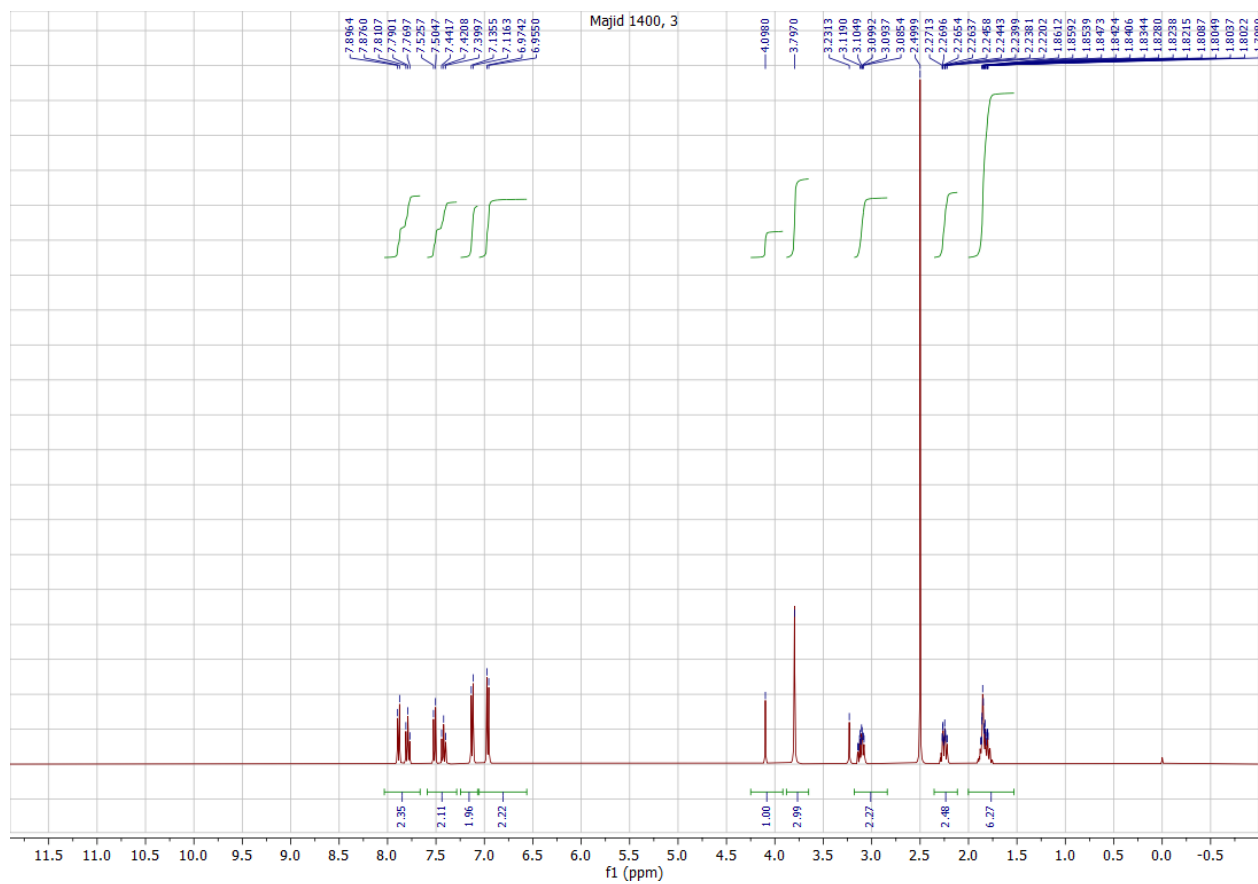
**Figure S<sub>8</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(piperidin-1-yl(o-tolyl) methyl)-2H-chromen-2-one



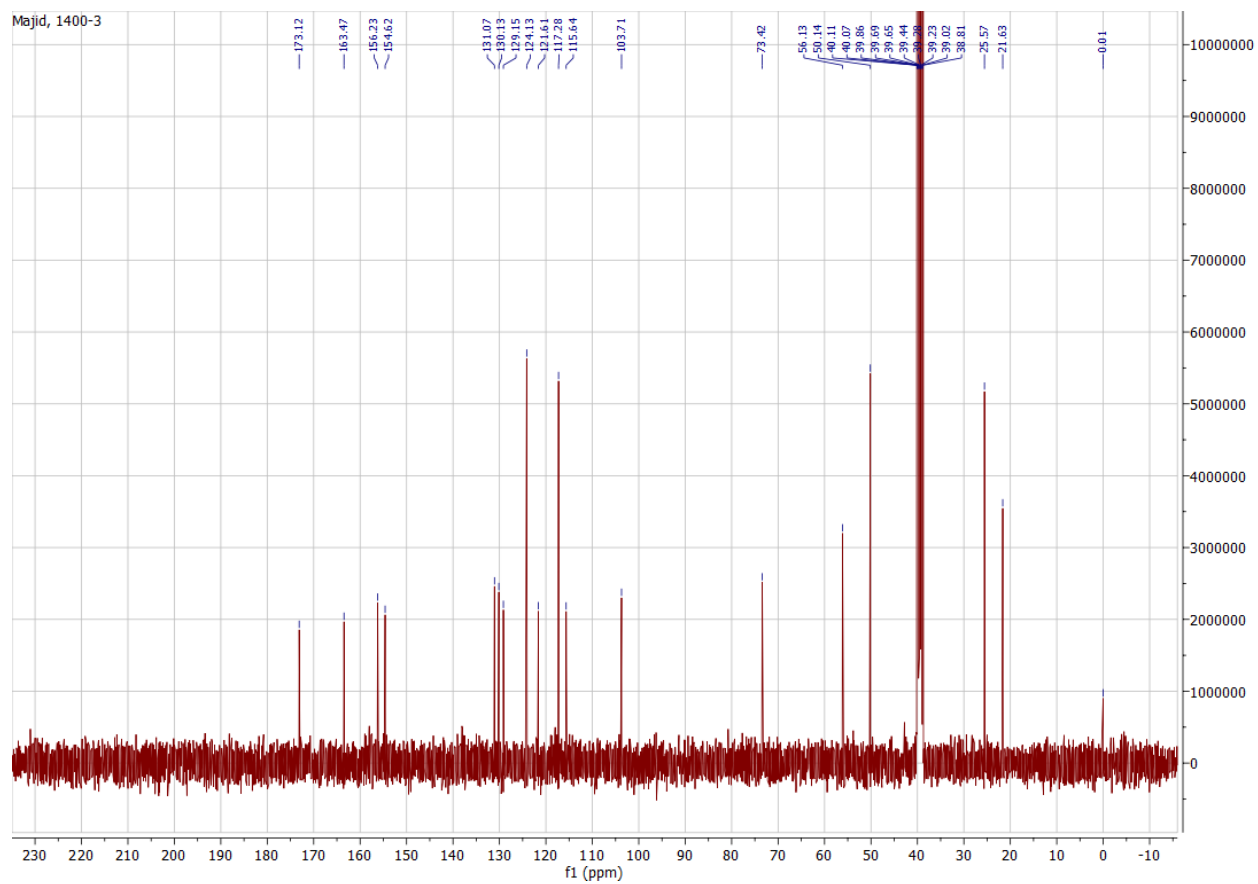
**Figure S9:**  $^1\text{H-NMR}$  spectra of 4-hydroxy-3-(piperidin-1-yl(p-tolyl)methyl)-2H-chromen-2-one



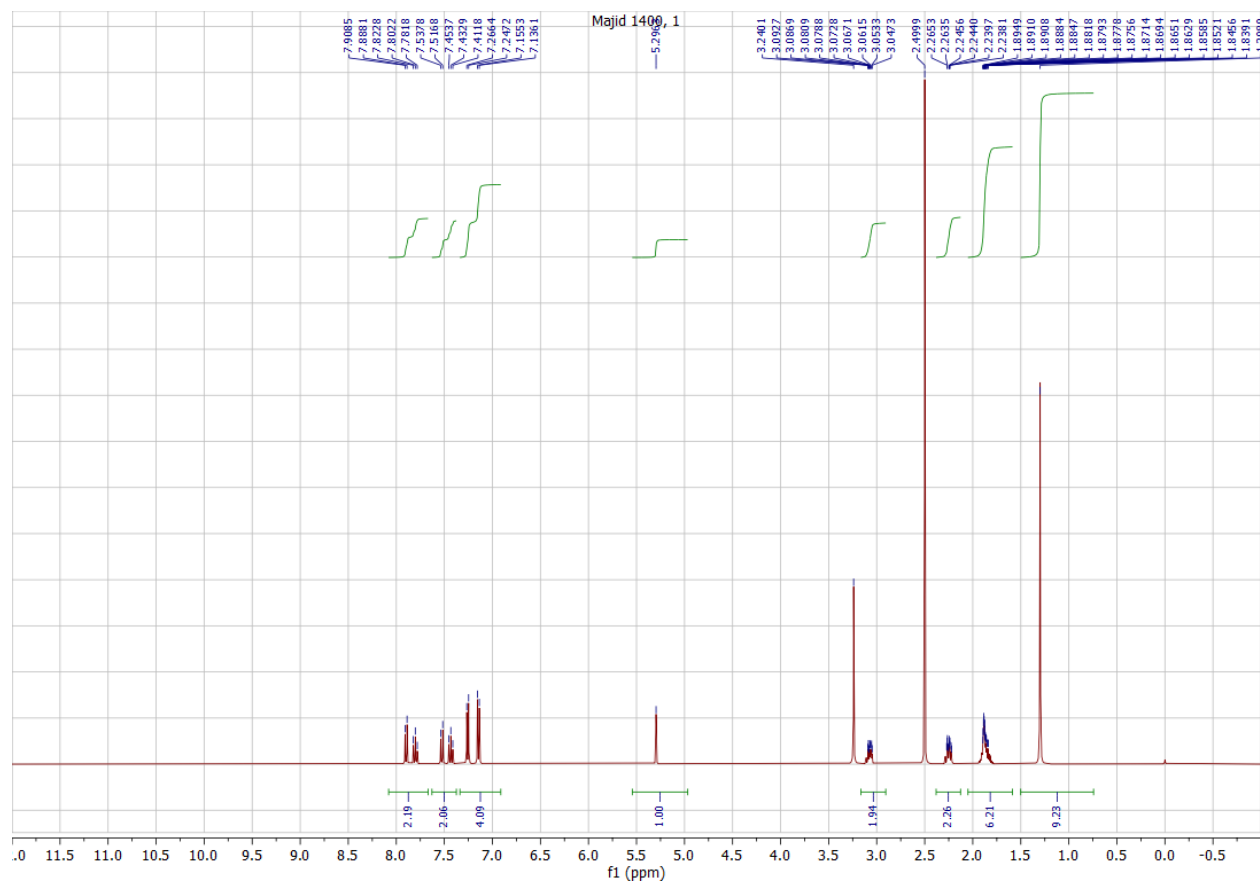
**Figure S<sub>10</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(piperidin-1-yl(p-tolyl)methyl)-2H-chromen-2-one



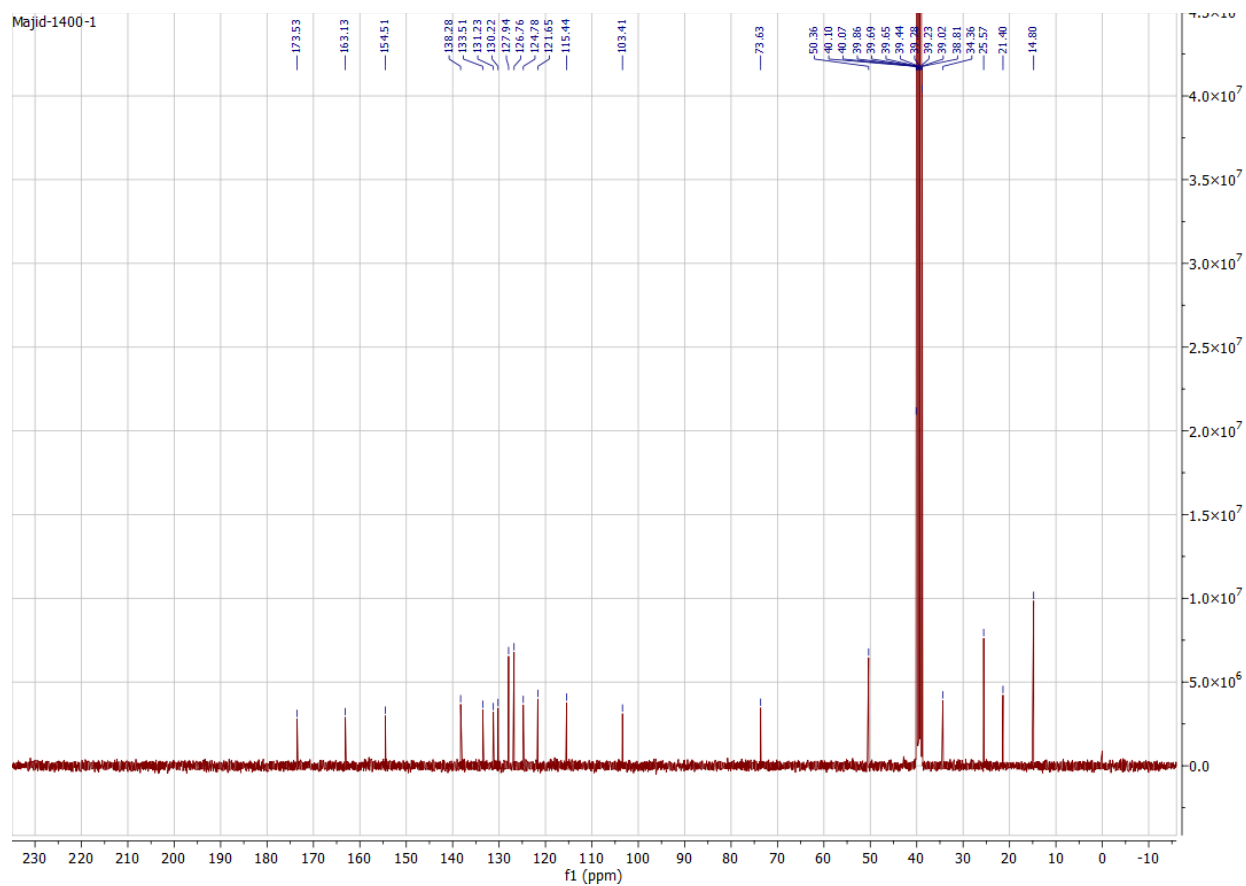
**Figure S<sub>11</sub>:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-((4-methoxyphenyl)(piperidin-1-yl)methyl)-2H-chromen-2-one



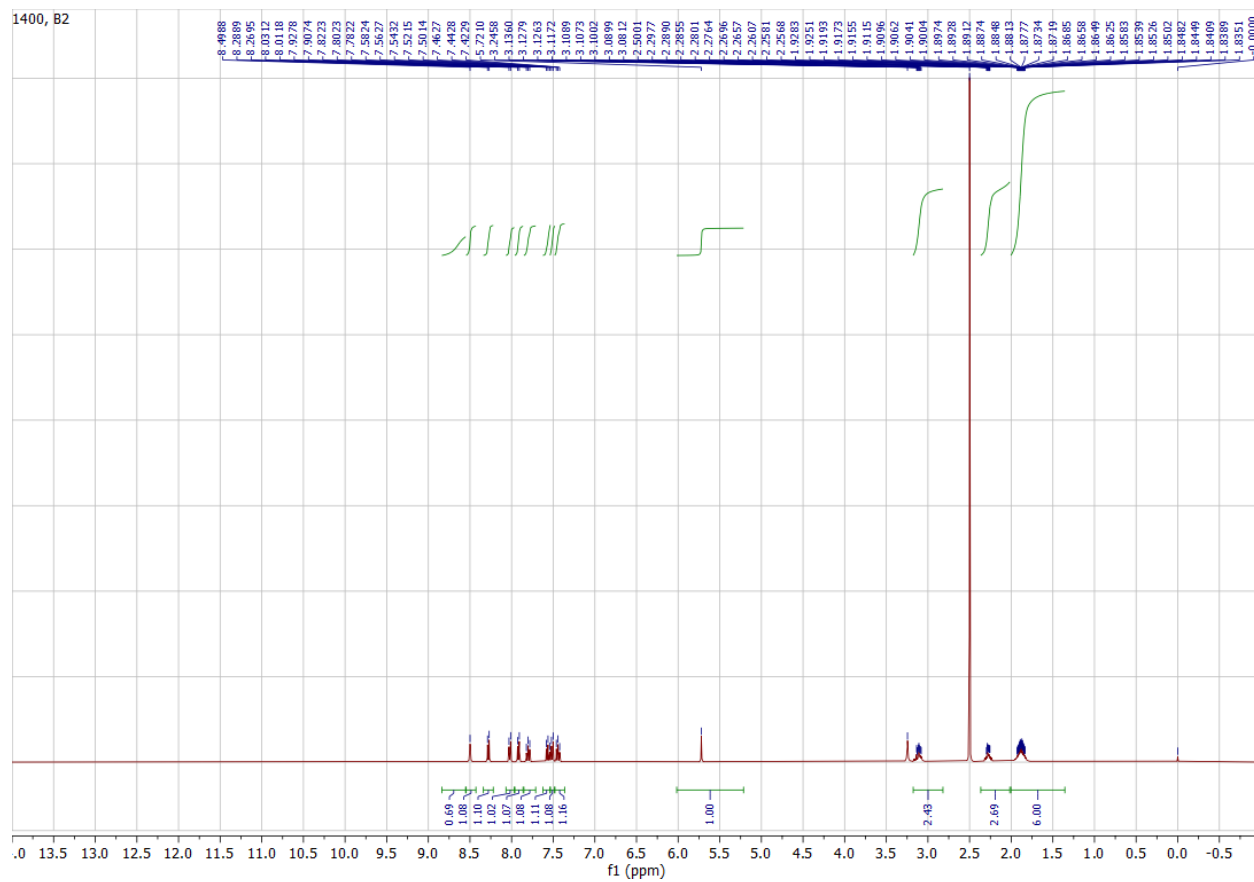
**Figure S<sub>12</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-((4-methoxyphenyl)(piperidin-1-yl)methyl)-2H-chromen-2-one



**Figure S<sub>13</sub>:** <sup>1</sup>H-NMR spectra of 3-((4-(tert-butyl)phenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

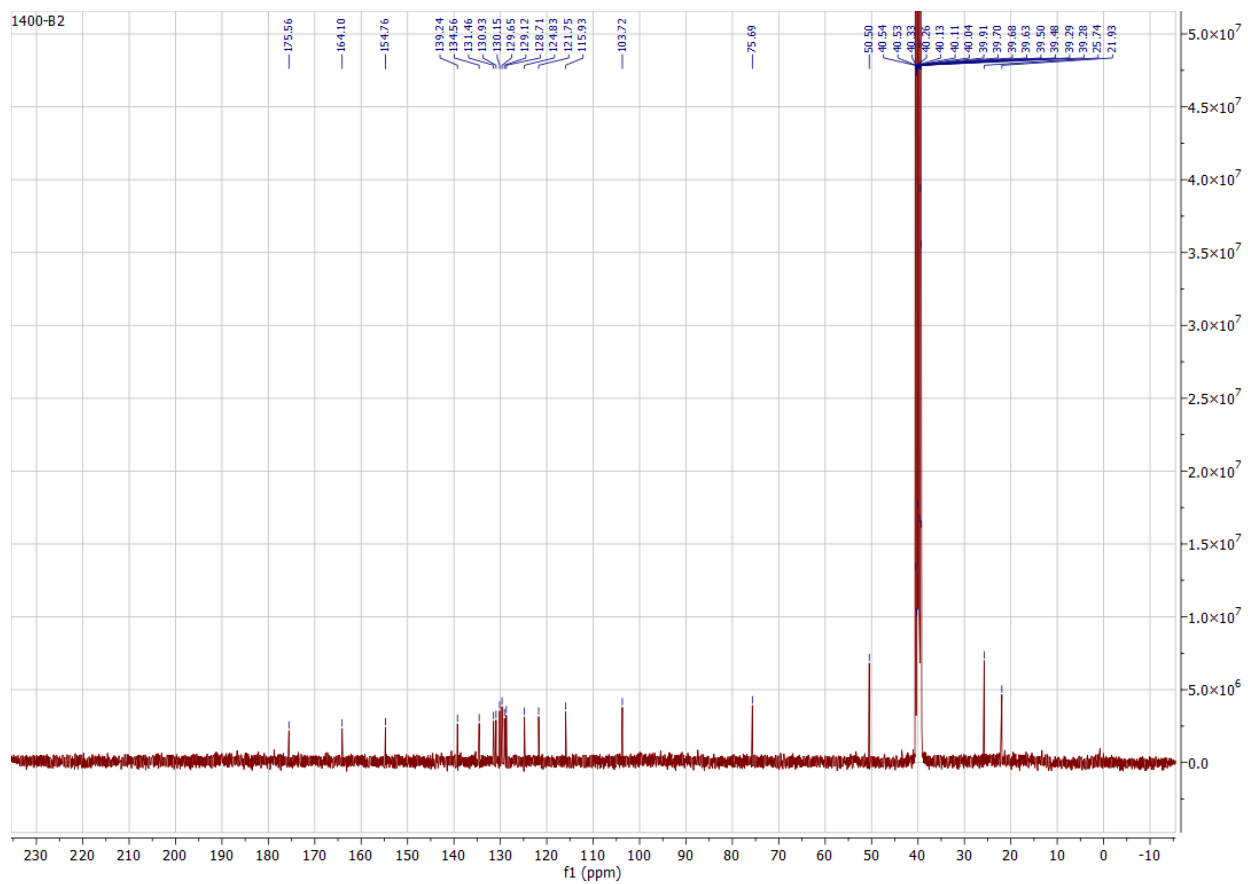


**Figure S<sub>14</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-(tert-butyl)phenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

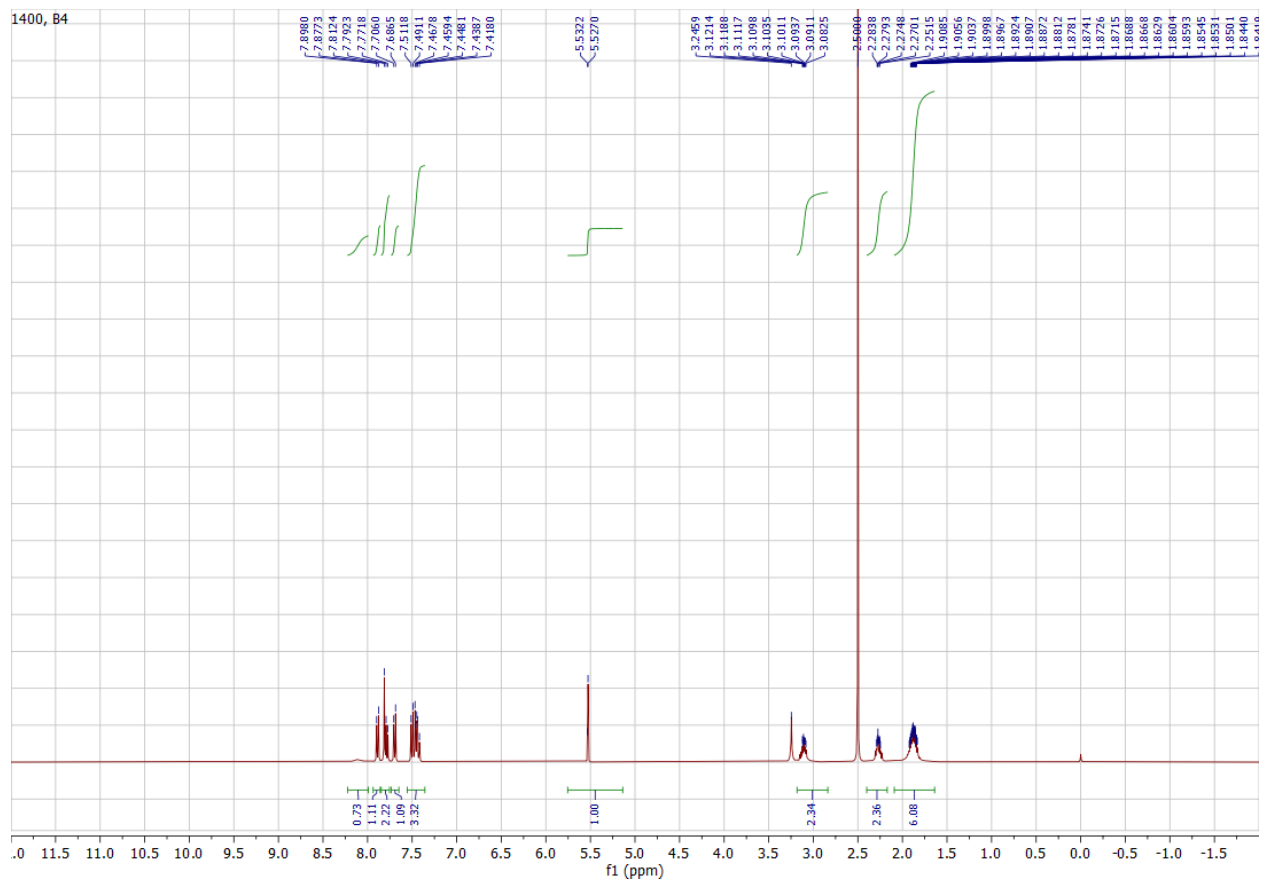


**Figure S<sub>15</sub>:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-((3-nitrophenyl)(piperidin-1-yl)methyl)-2H-chromen-2-one

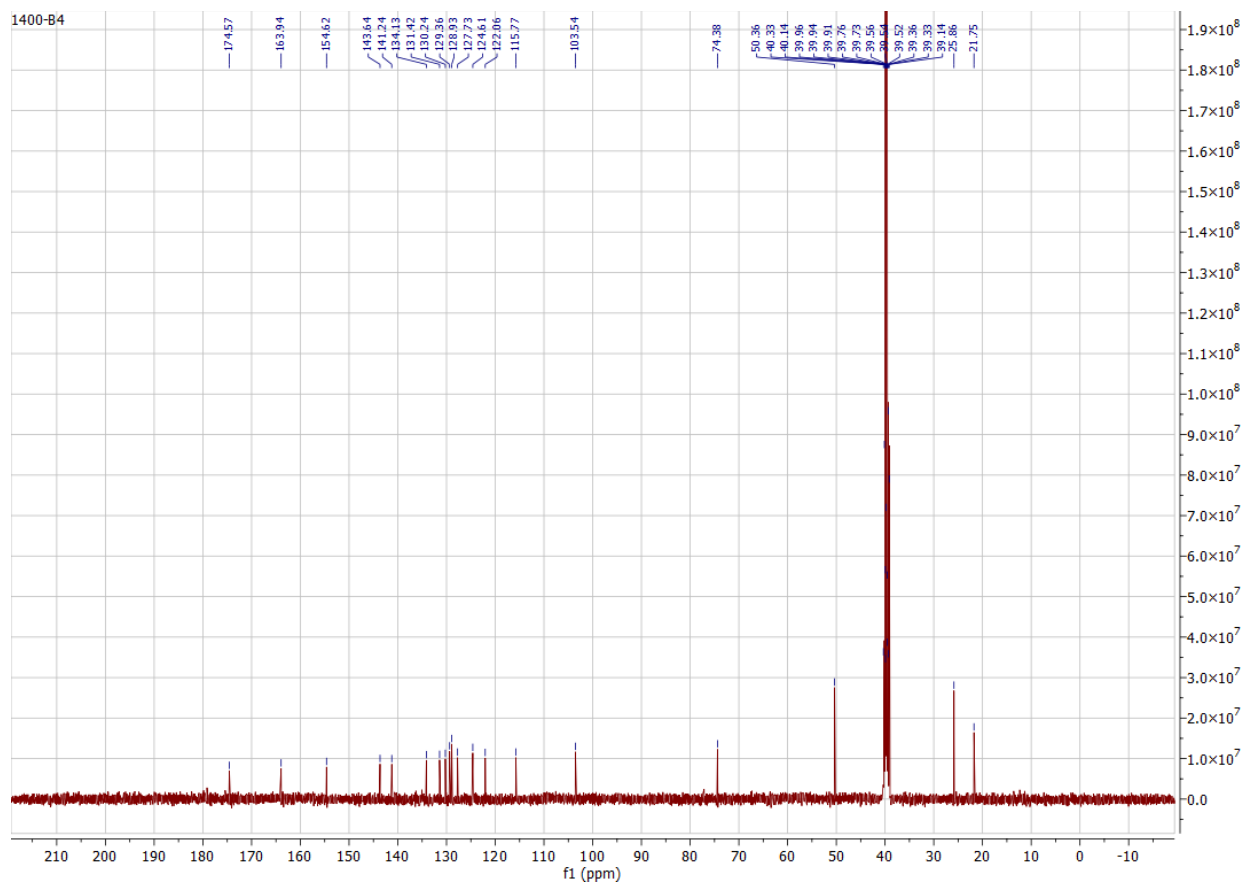




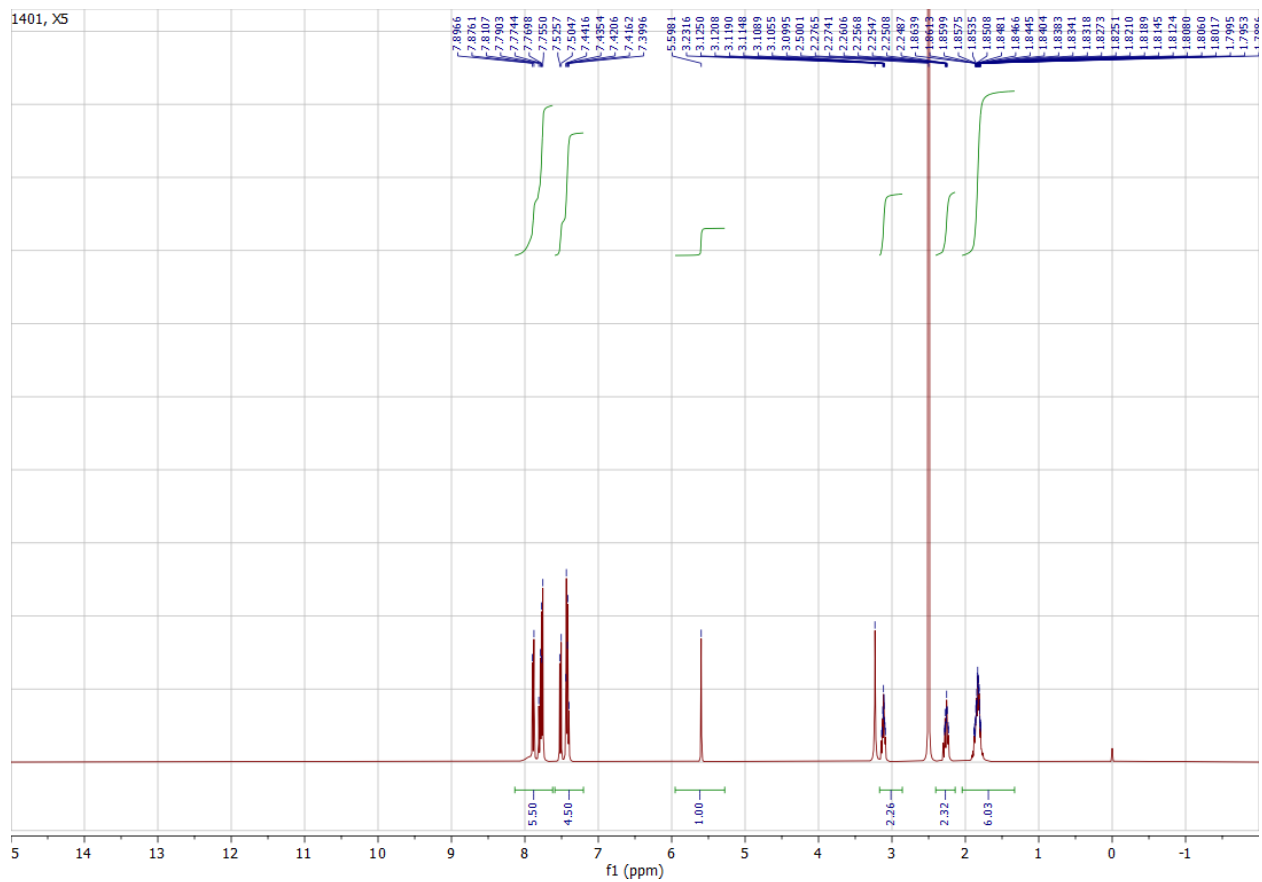
**Figure S<sub>16</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-((3-nitrophenyl)(piperidin-1-yl)methyl)-2H-chromen-2-one



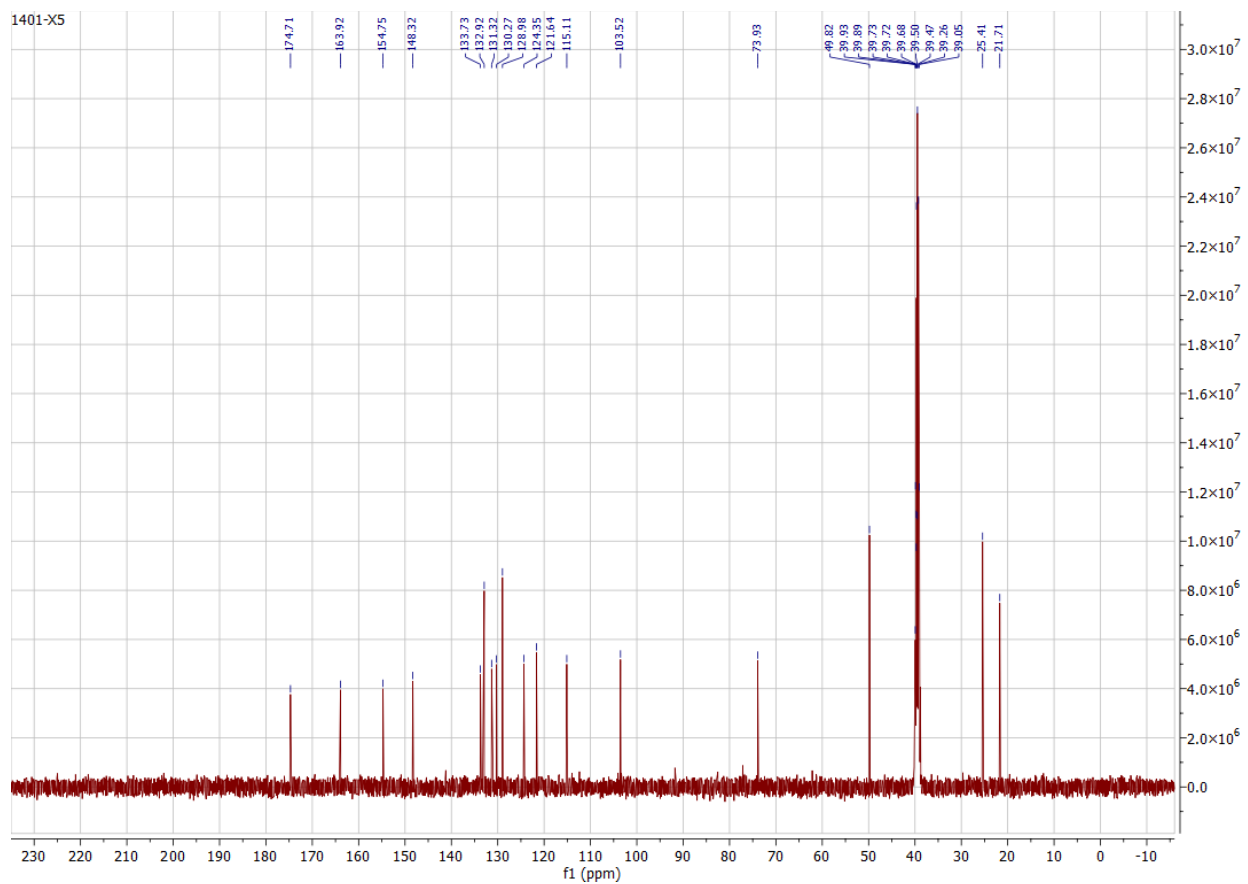
**Figure S<sub>17</sub>:** H-NMR spectra of 3-((2,4-dichlorophenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one



**Figure S<sub>18</sub>:** <sup>13</sup>C-NMR spectra of 3-((2,4-dichlorophenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

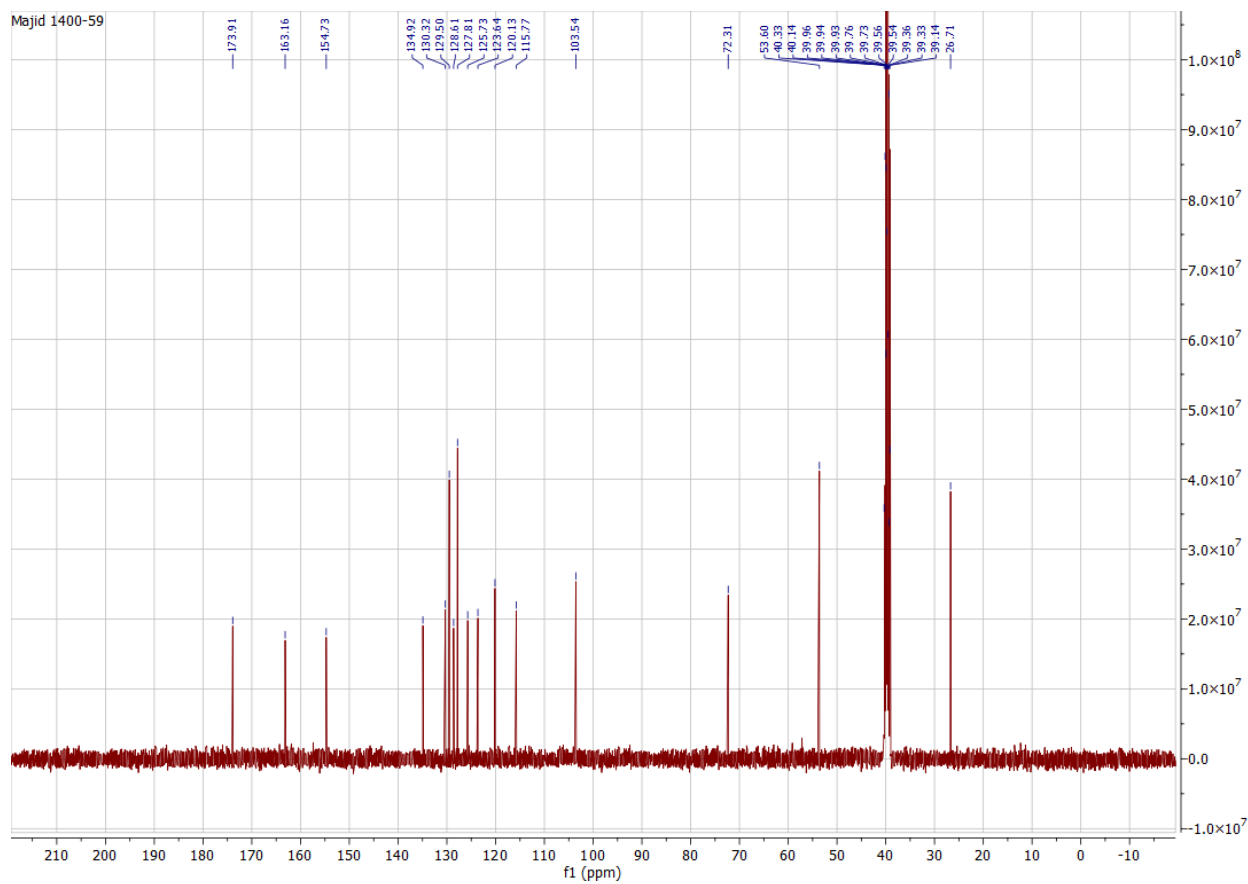


**Figure S<sub>19</sub>:** H-NMR spectra of 3-((4-bromophenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

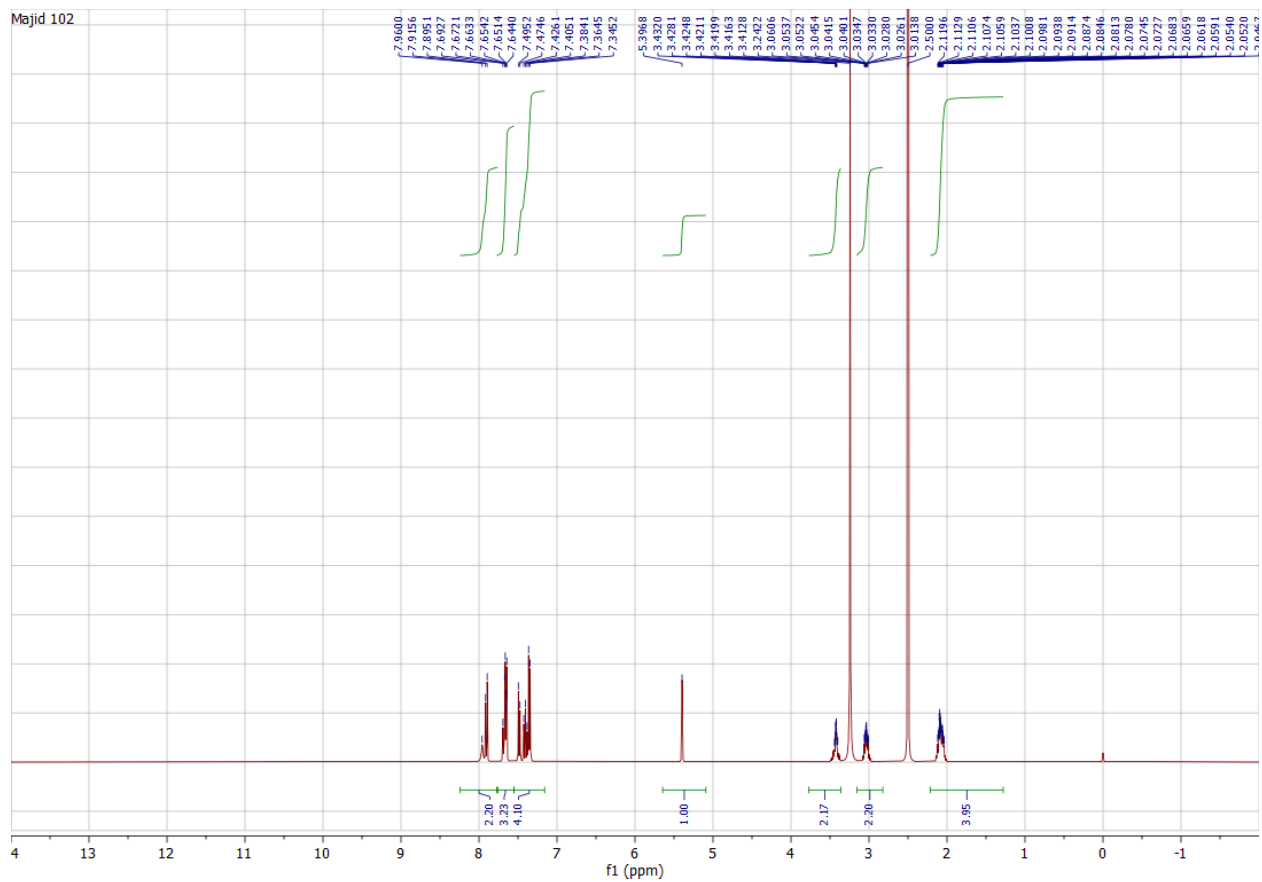


**Figure S<sub>20</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-bromophenyl)(piperidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one



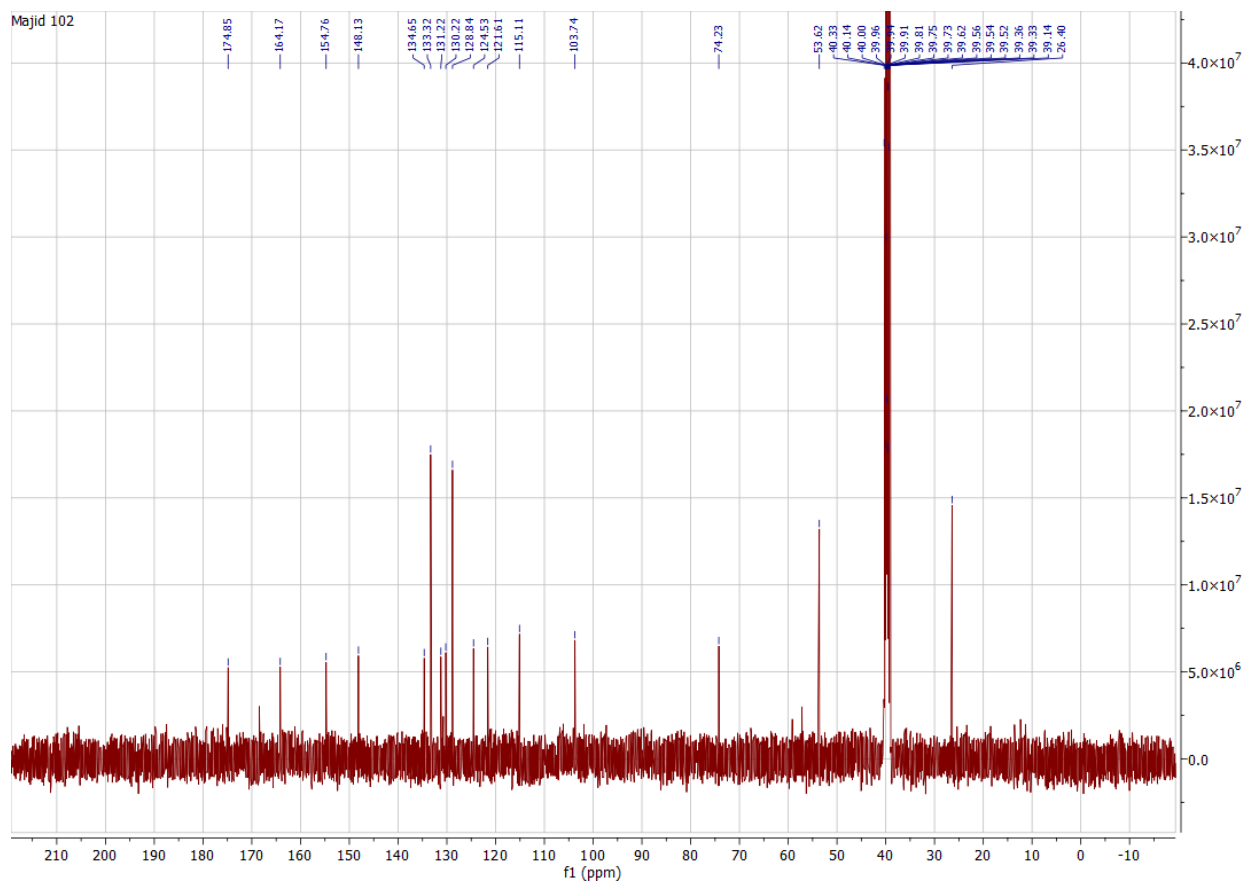


**Figure S22:**  $^{13}\text{C}$ -NMR spectra of 4-hydroxy-3-(phenyl(pyrrolidin-1-yl)methyl)-2H-chromen-2-one

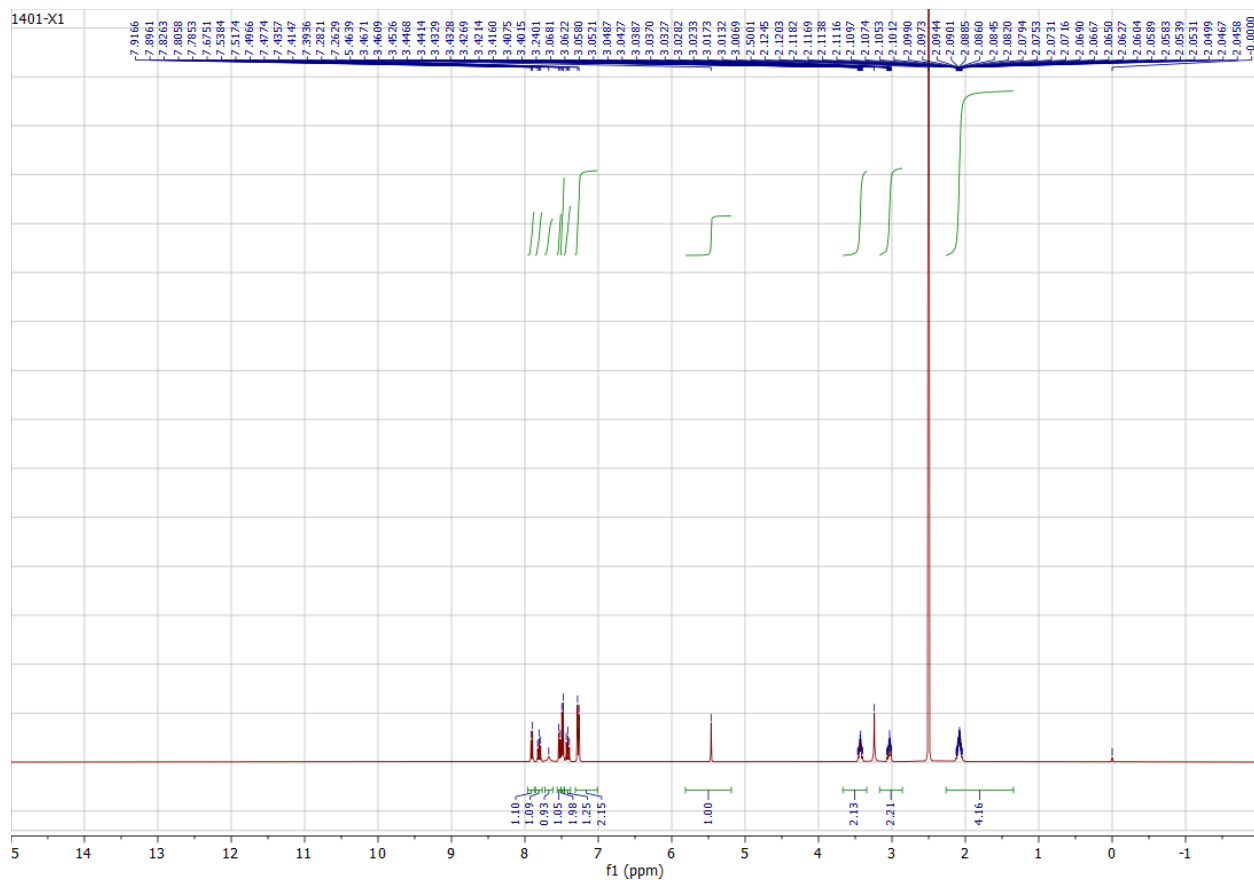


**Figure S<sub>23</sub>:** H-NMR spectra of 3-((4-bromophenyl)(pyrrolidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

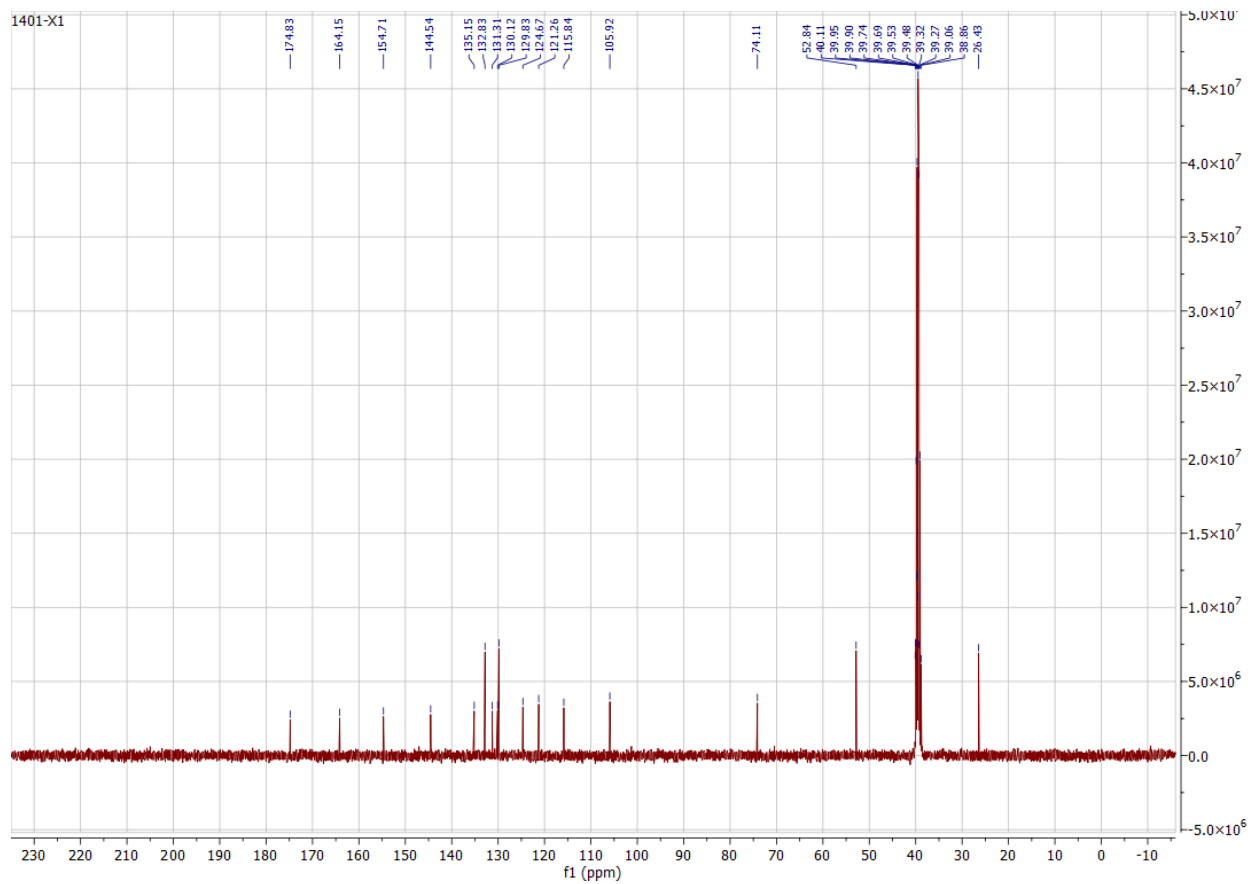




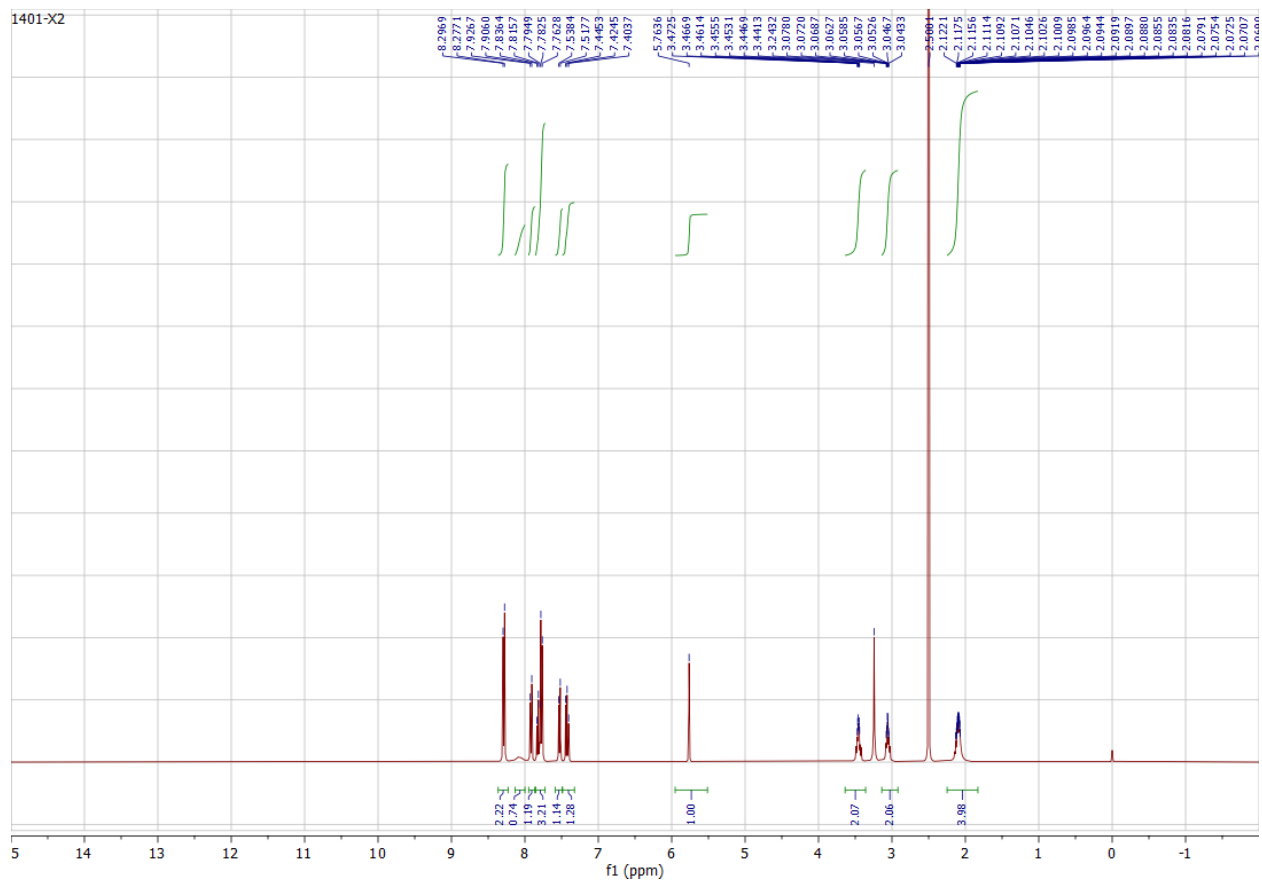
**Figure S<sub>24</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-bromophenyl)(pyrrolidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one



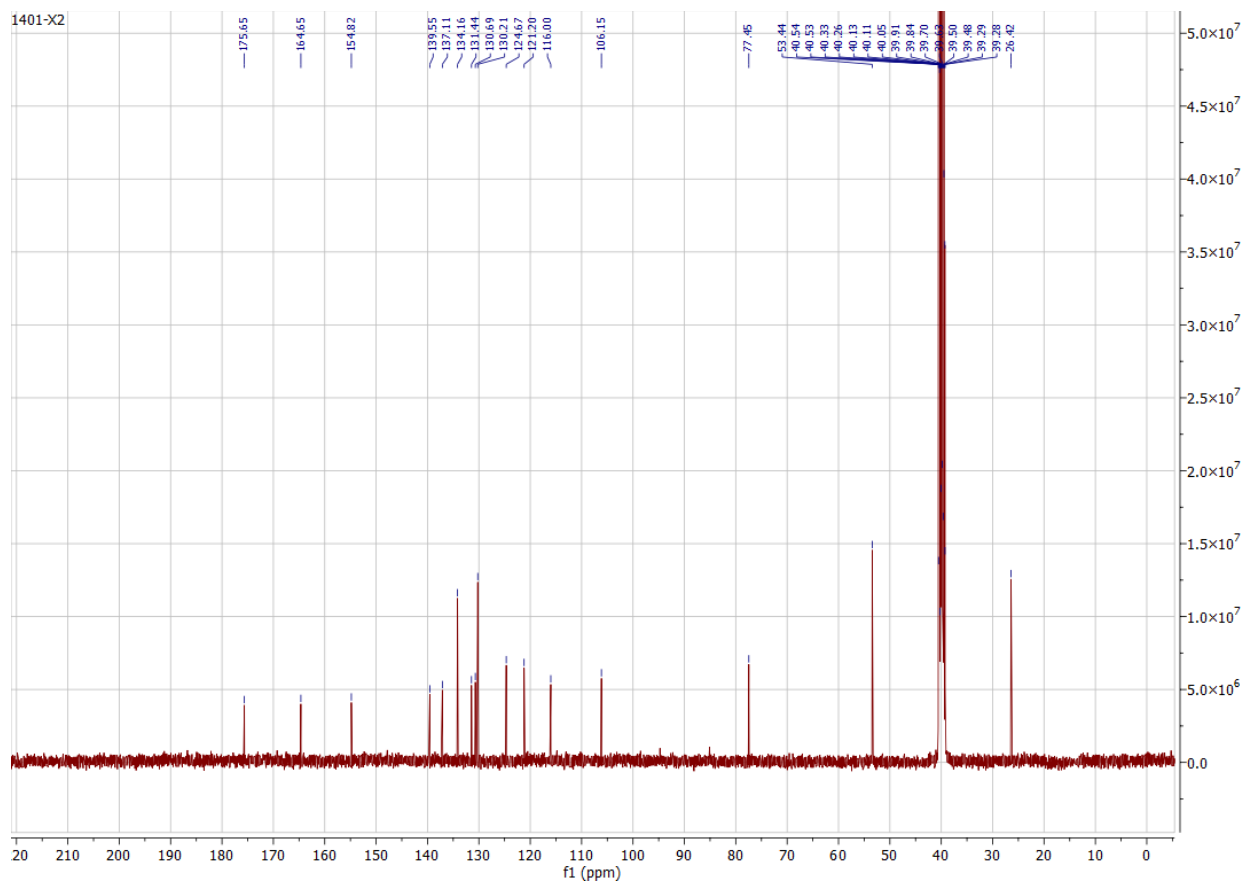
**Figure S<sub>25</sub>:** <sup>1</sup>H-NMR spectra of 3-((4-chlorophenyl)(pyrrolidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one



**Figure S<sub>26</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-chlorophenyl)(pyrrolidin-1-yl)methyl)-4-hydroxy-2H-chromen-2-one

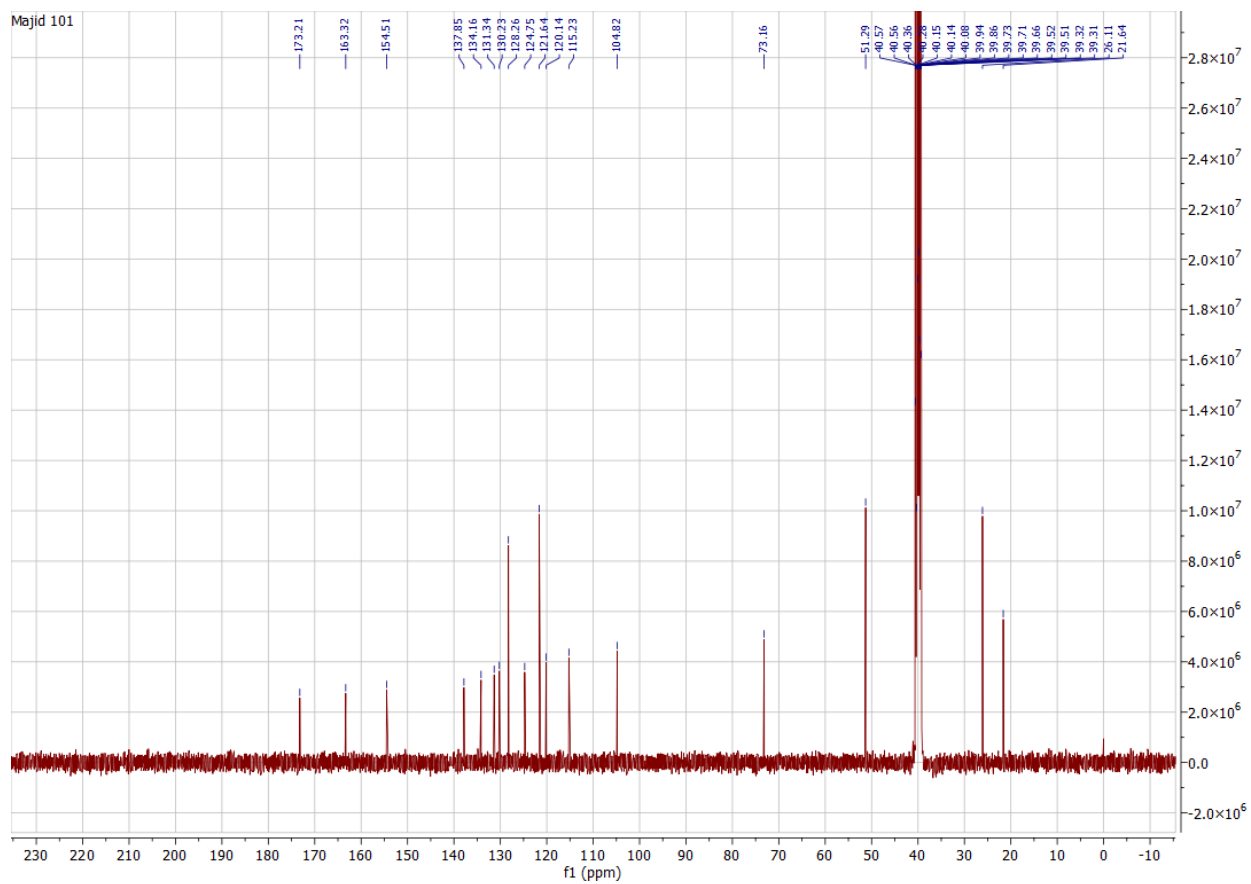


**Figure S27:**  $^1\text{H-NMR}$  spectra of 4-hydroxy-3-((4-nitrophenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one

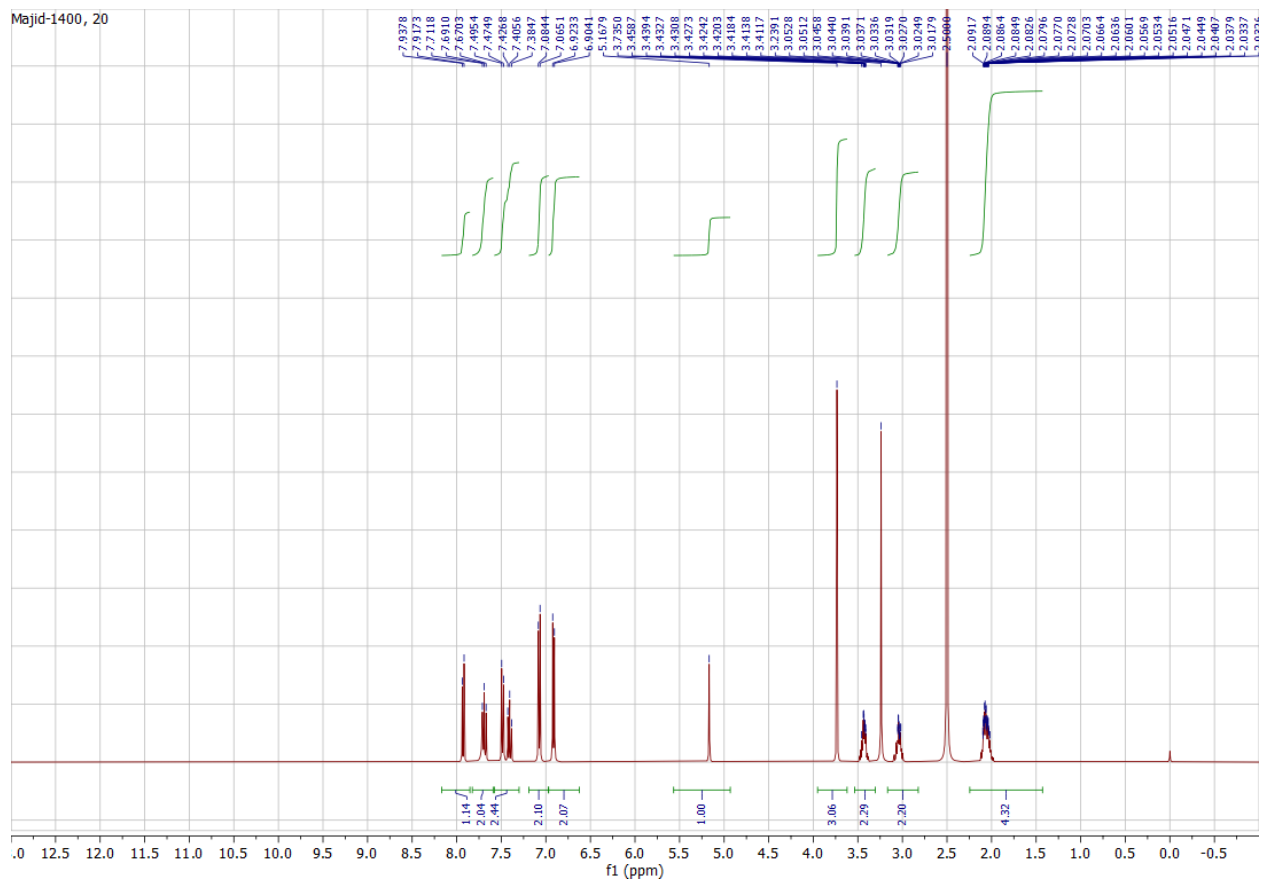


**Figure S<sub>28</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-((4-nitrophenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one



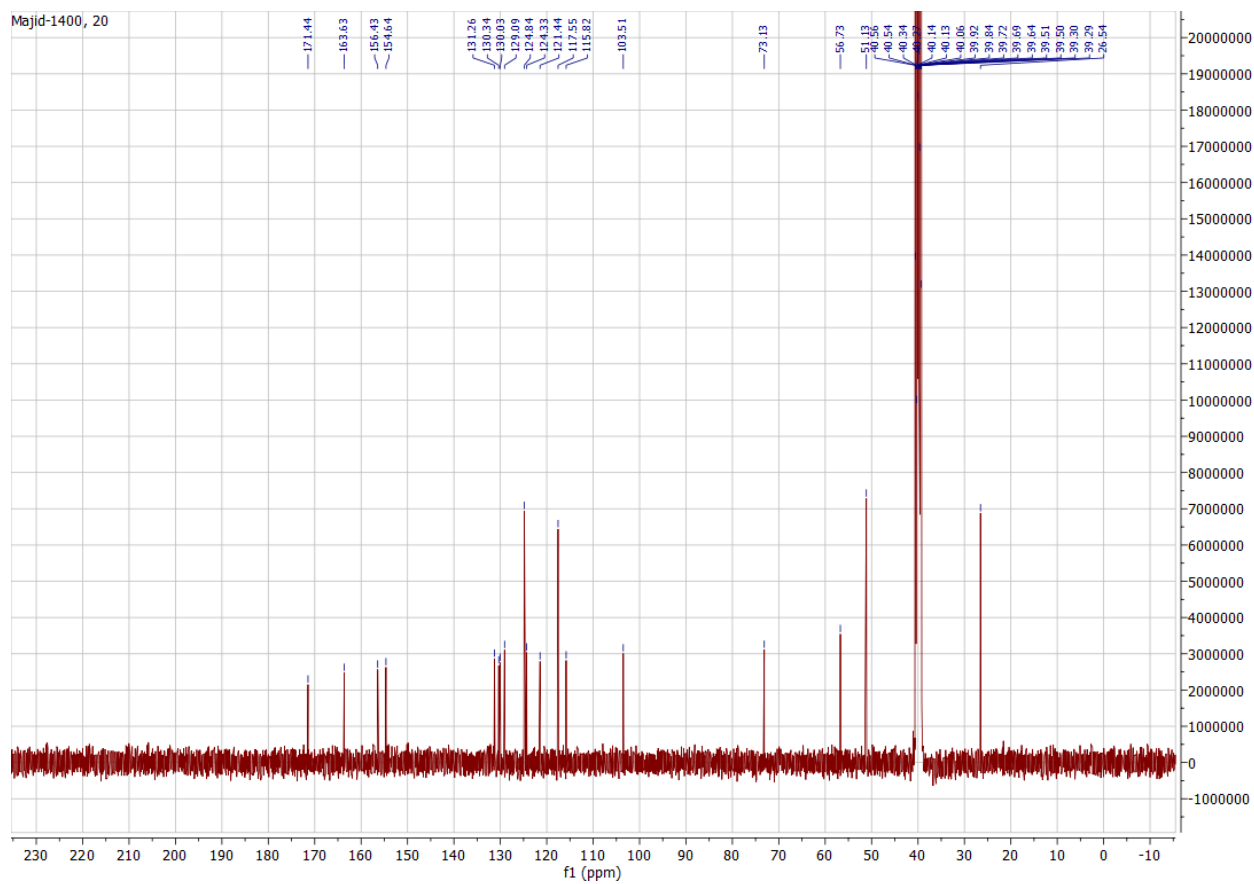


**Figure S<sub>30</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(pyrrolidin-1-yl(p-tolyl)methyl)-2H-chromen-2-one

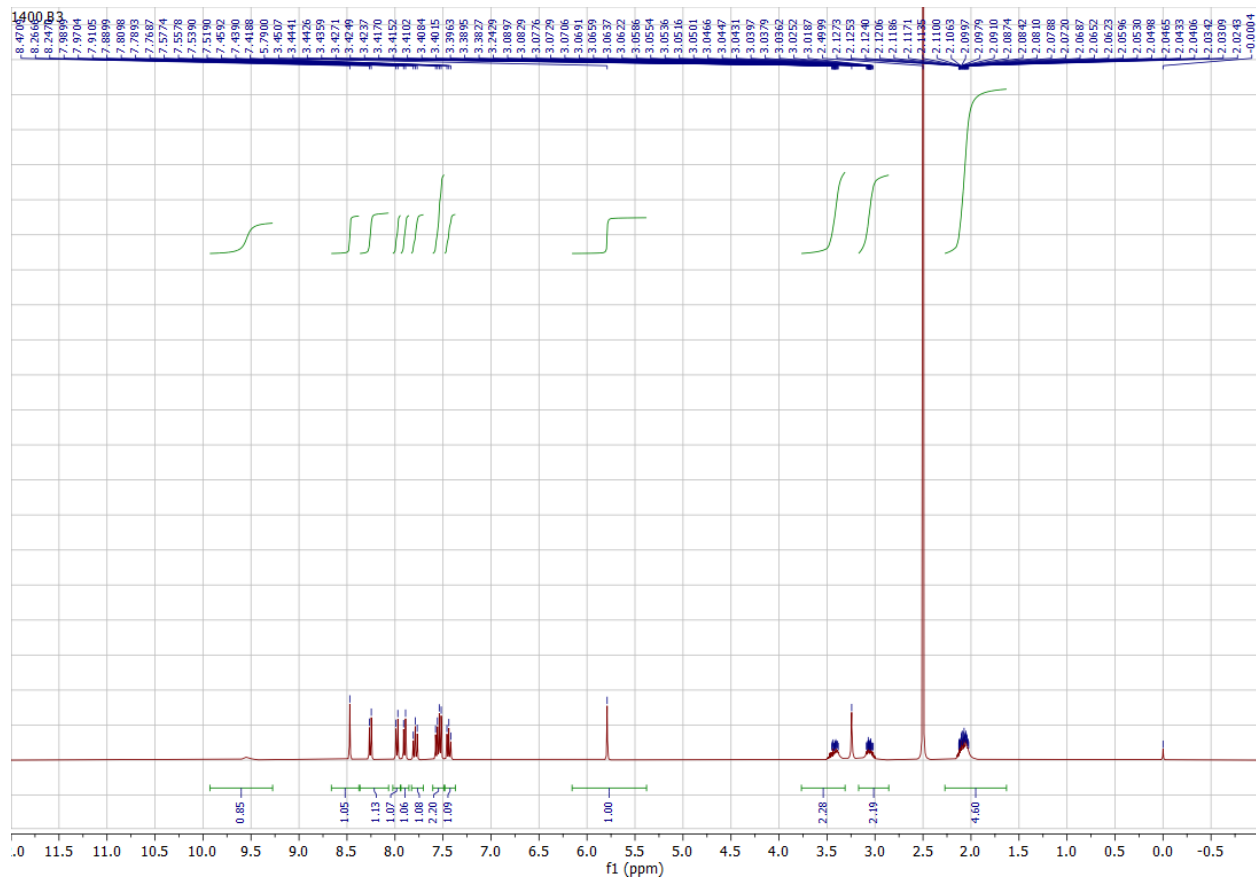


**Figure S<sub>31</sub>:** H-NMR spectra of 4-hydroxy-3-((4-methoxyphenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one

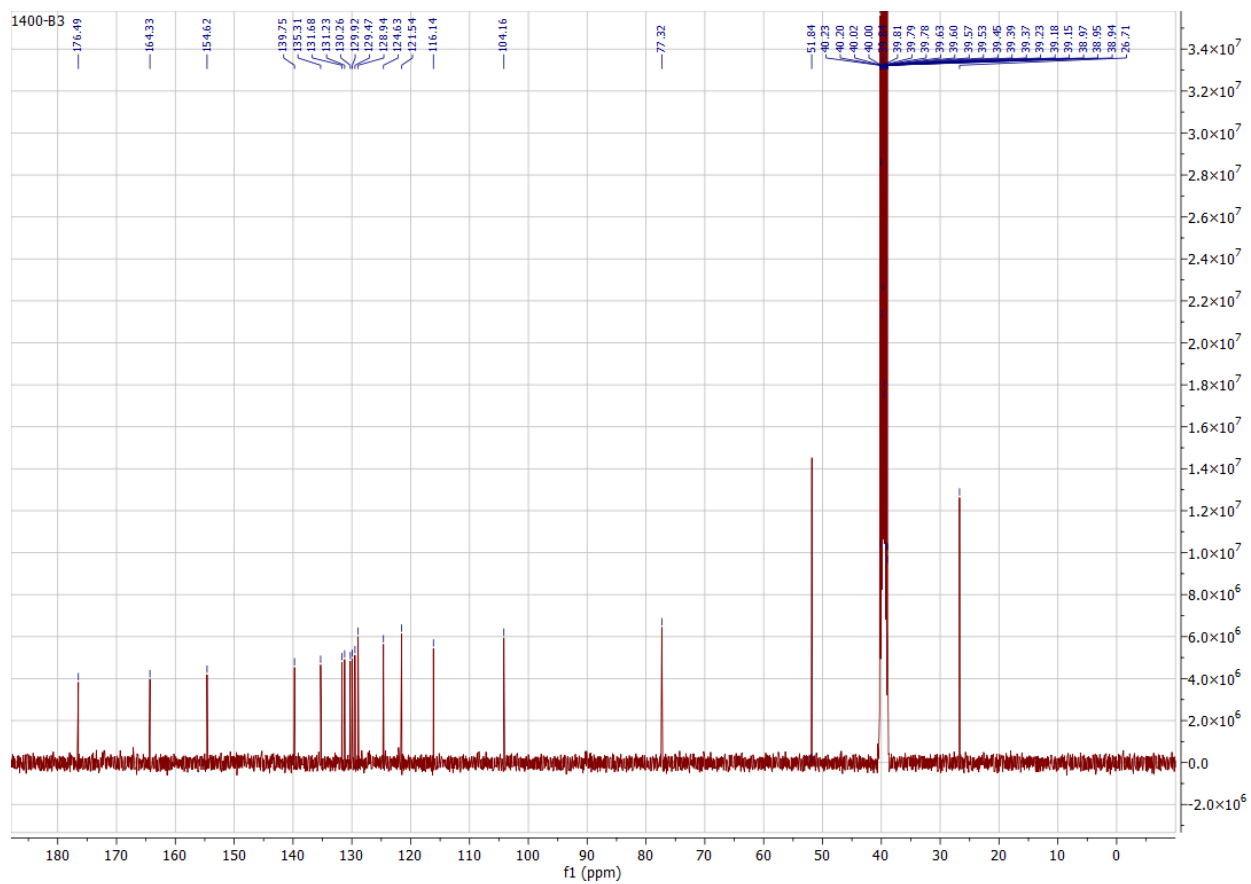




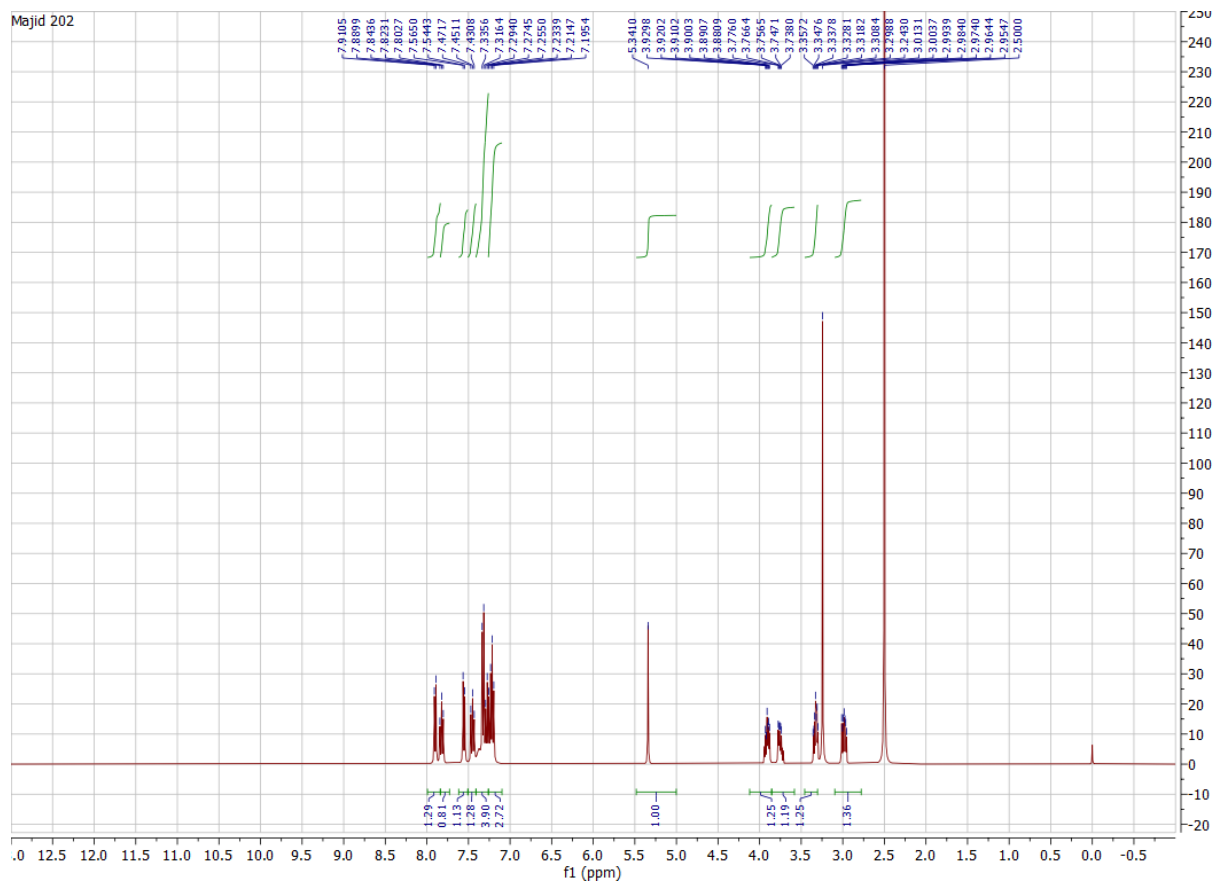
**Figure S<sub>32</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-((4-methoxyphenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one



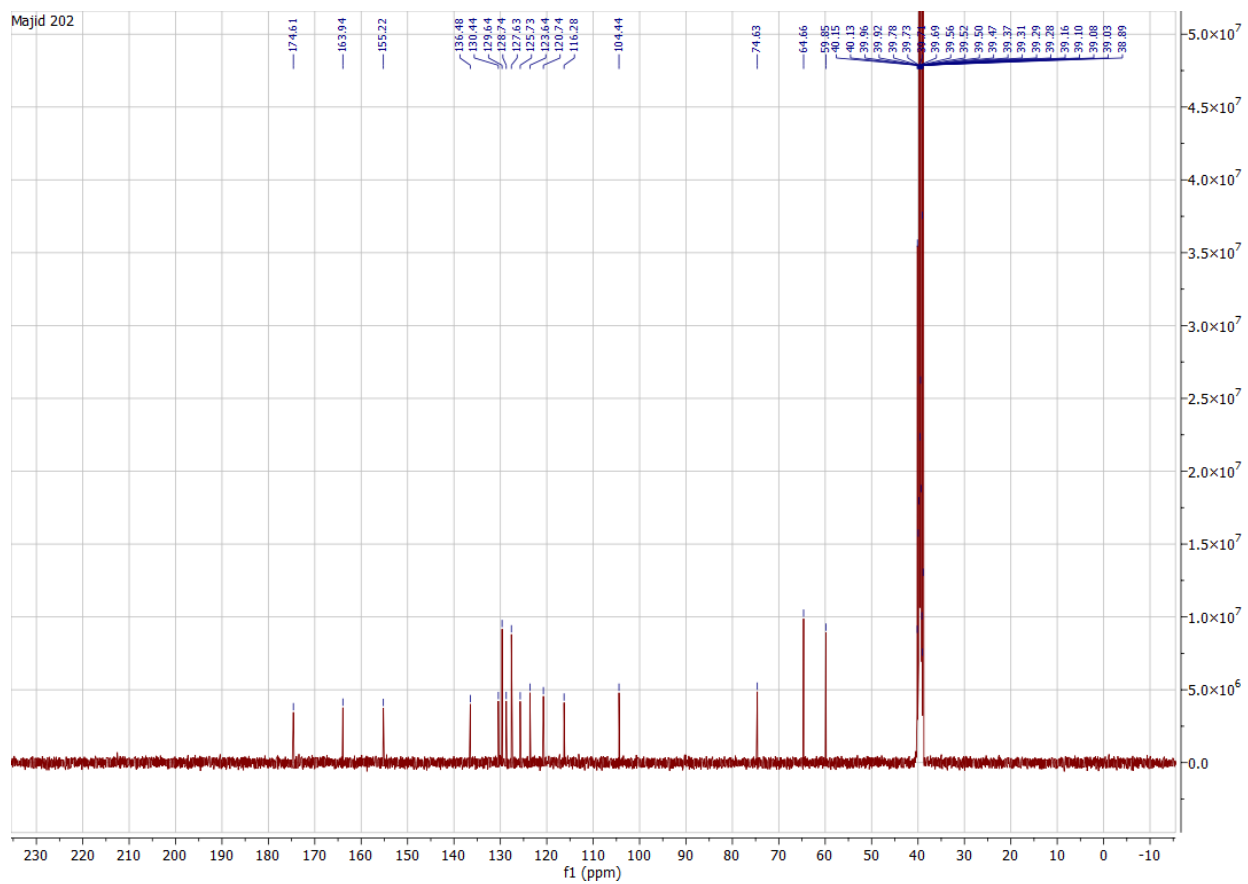
**Figure S33:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-((3-nitrophenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one



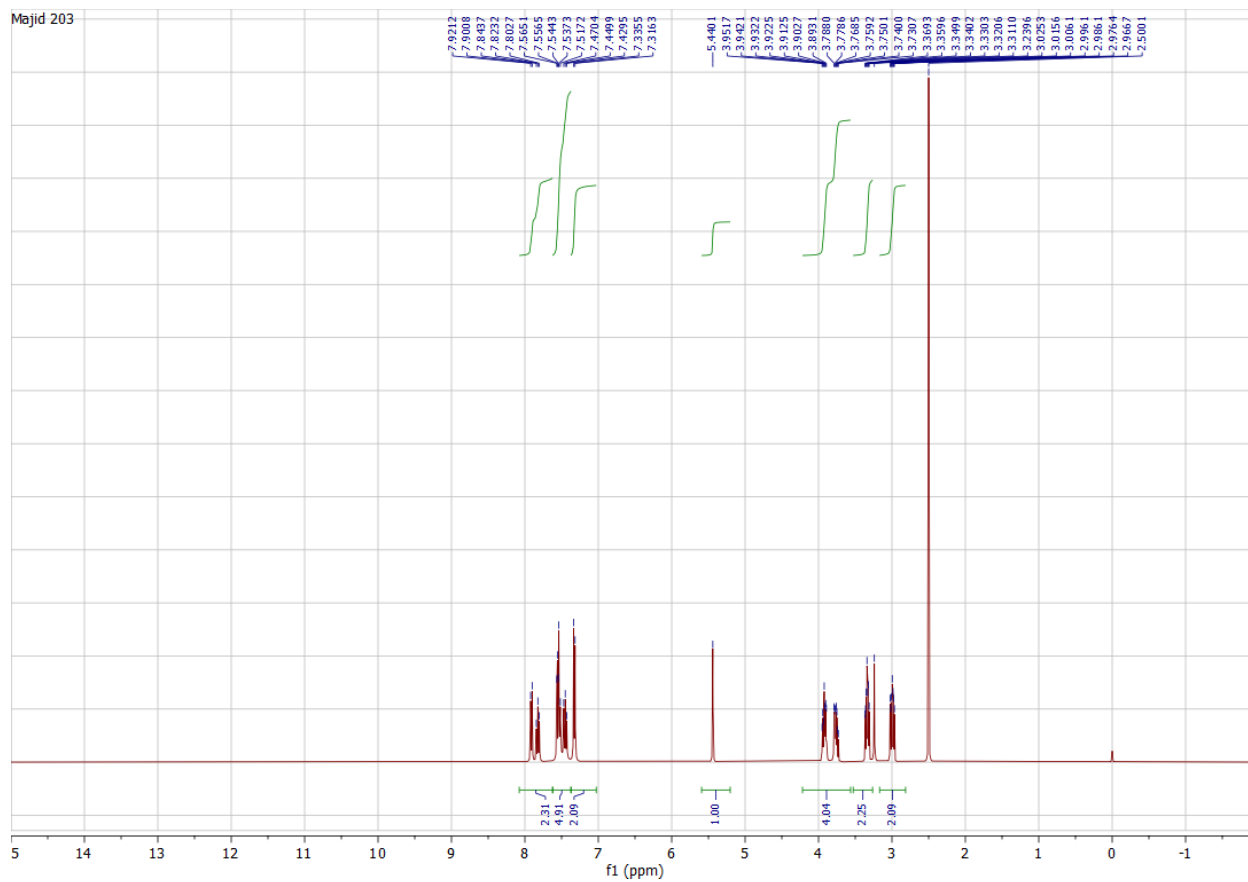
**Figure S<sub>34</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-((3-nitrophenyl)(pyrrolidin-1-yl)methyl)-2H-chromen-2-one



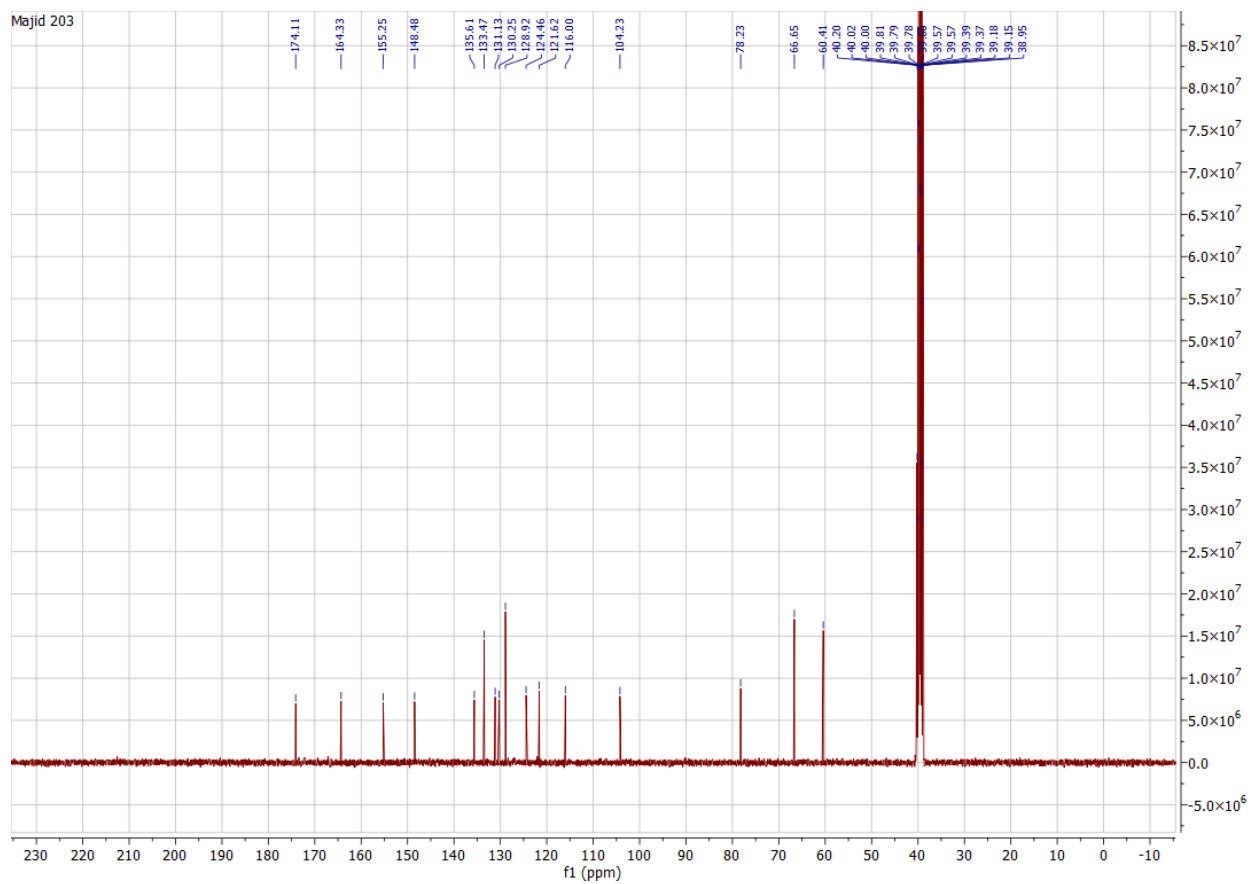
**Figure S<sub>35</sub>:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-(morpholino(phenyl)methyl)-2H-chromen-2-one



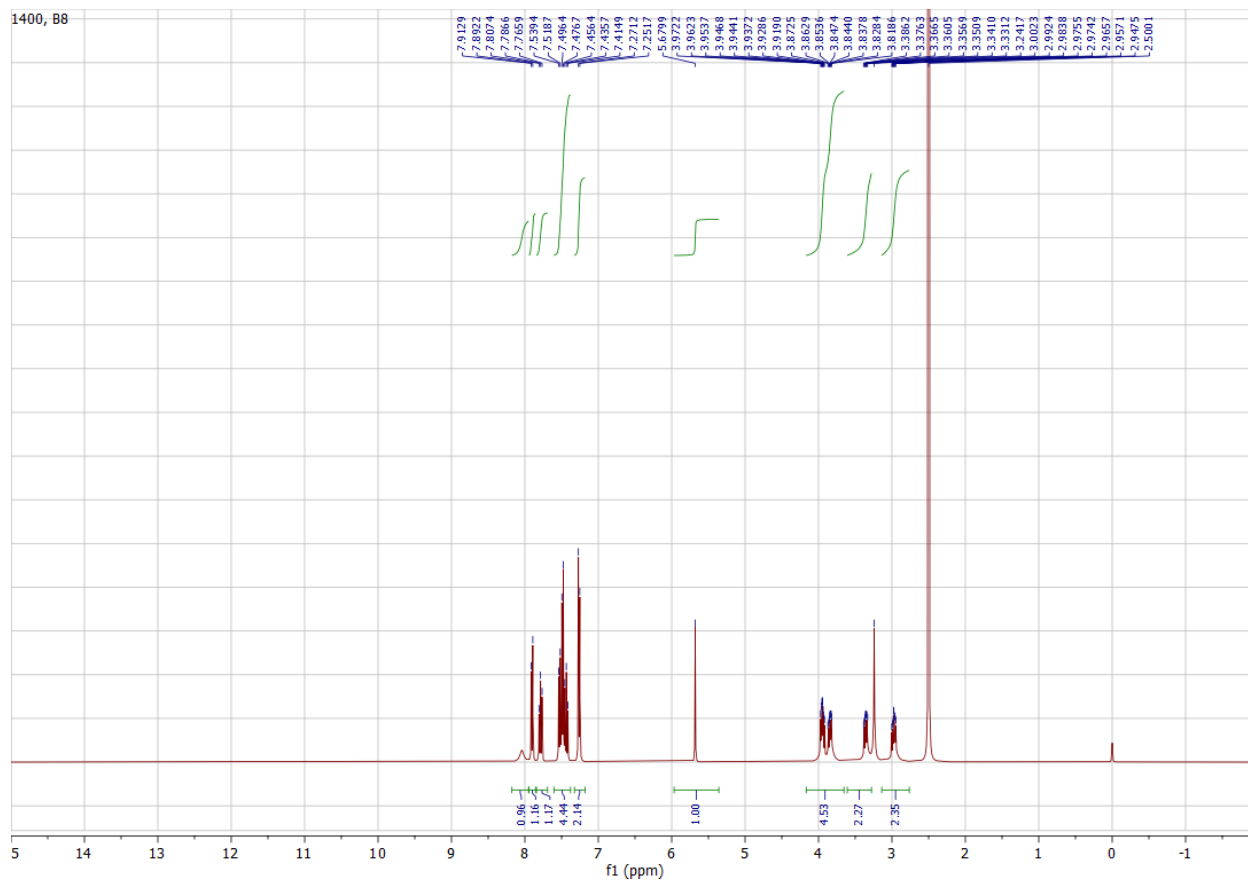
**Figure S<sub>36</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(morpholino(phenyl)methyl)-2H-chromen-2-one



**Figure S<sub>37</sub>:** <sup>1</sup>H-NMR spectra of 3-((4-bromophenyl)(morpholino)methyl)-4-hydroxy-2H-chromen-2-one

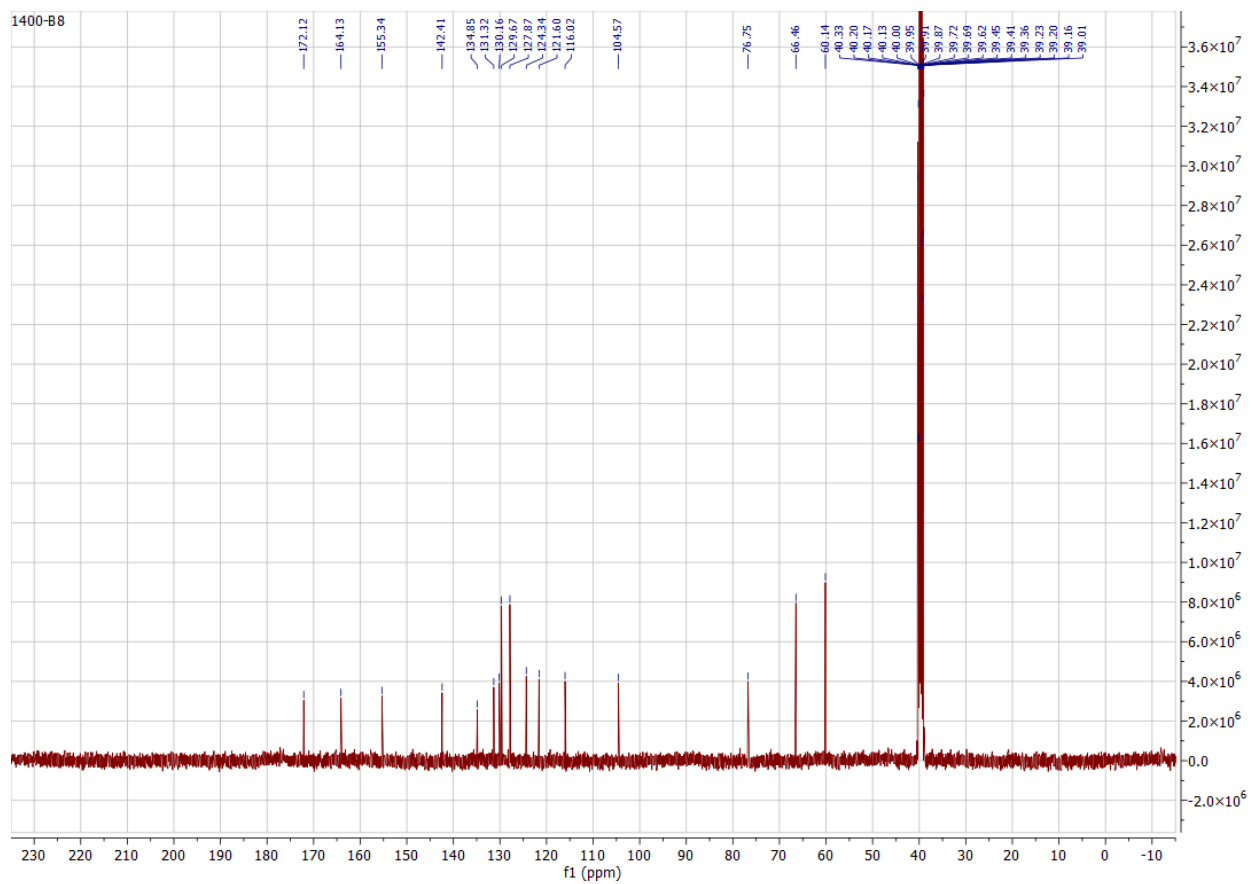


**Figure S38:**  $^{13}\text{C}$ -NMR spectra of 3-((4-bromophenyl)(morpholino)methyl)-4-hydroxy-2H-chromen-2-one



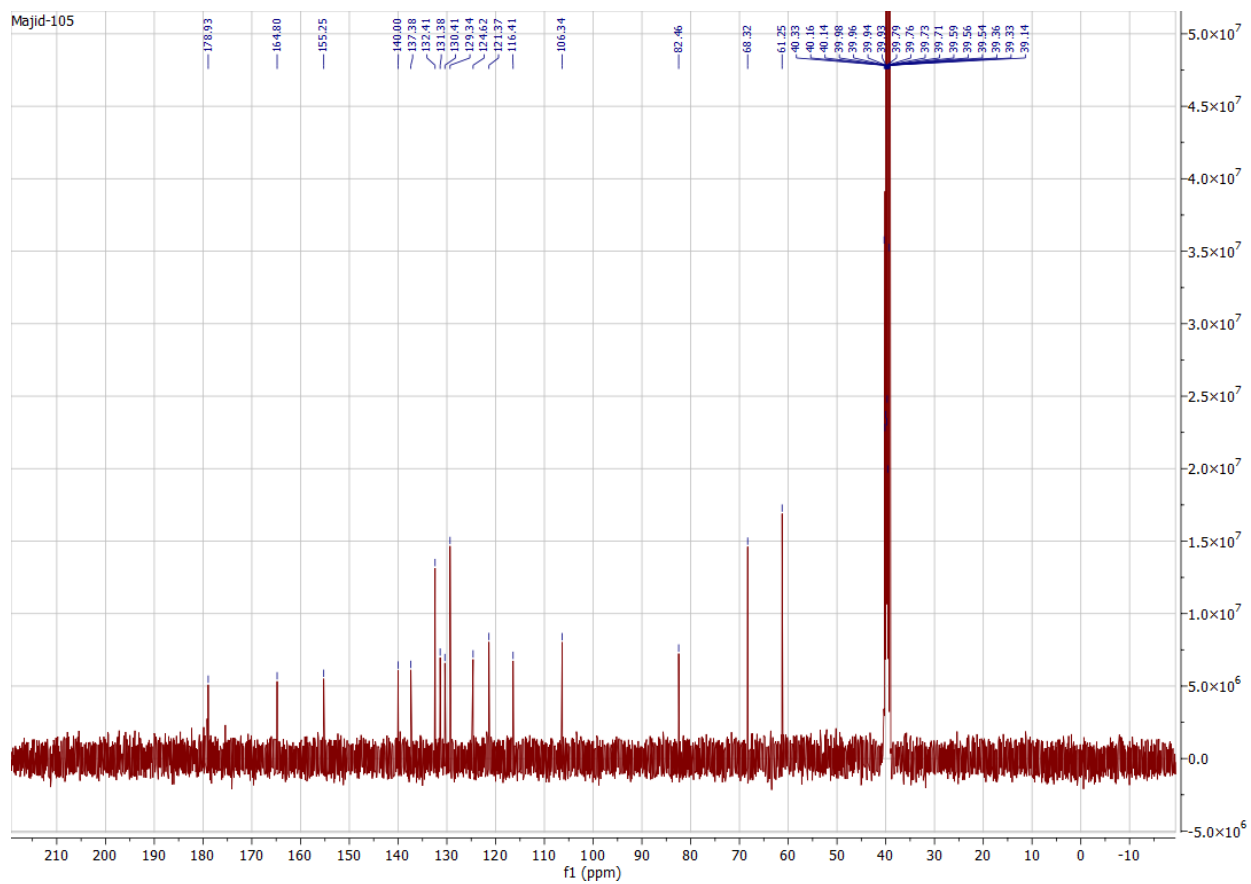
**Figure S39:**  $^1\text{H-NMR}$  spectra of 3-((4-chlorophenyl)(morpholino)methyl)-4-hydroxy-2H-chromen-2-one



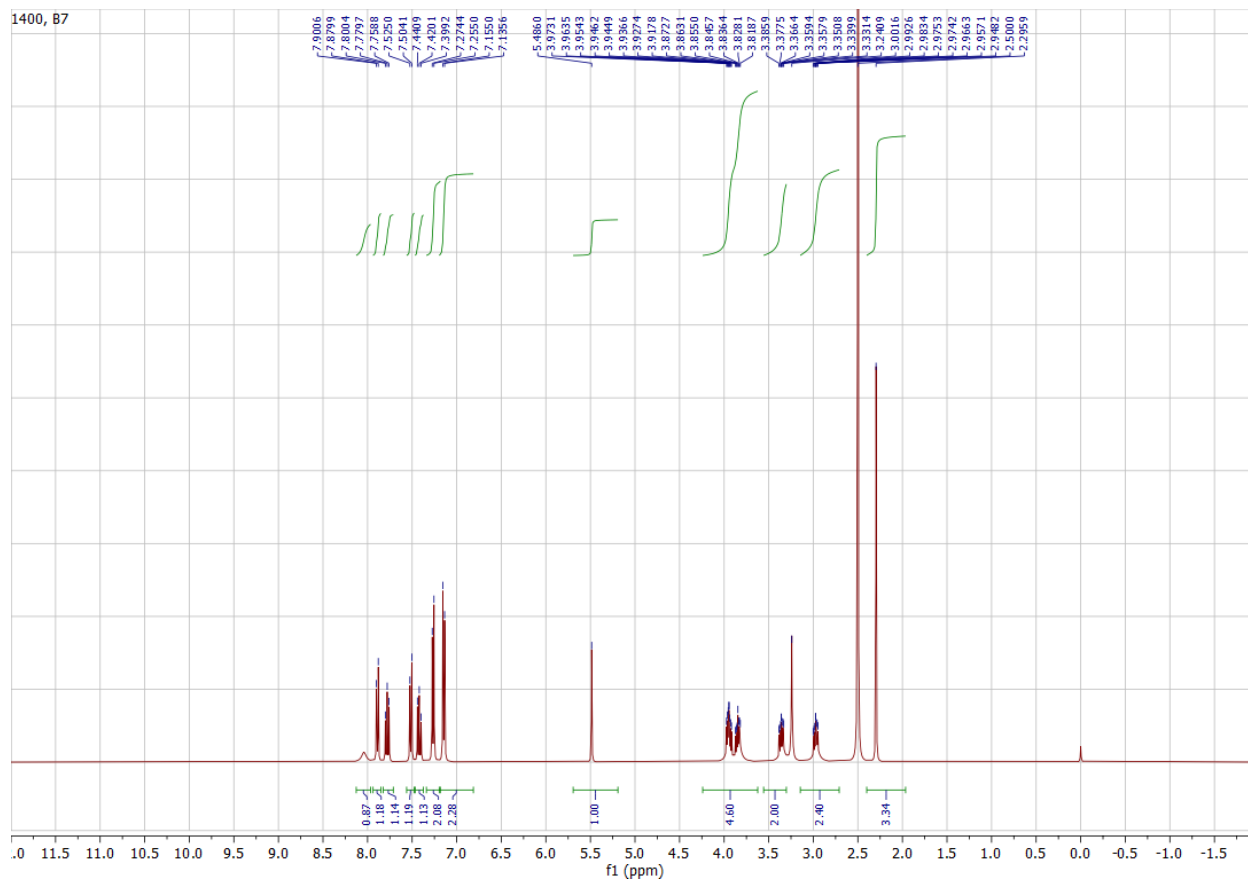


**Figure S<sub>40</sub>:** <sup>13</sup>C-NMR spectra of 3-((4-chlorophenyl)(morpholino)methyl)-4-hydroxy-2H-chromen-2-one

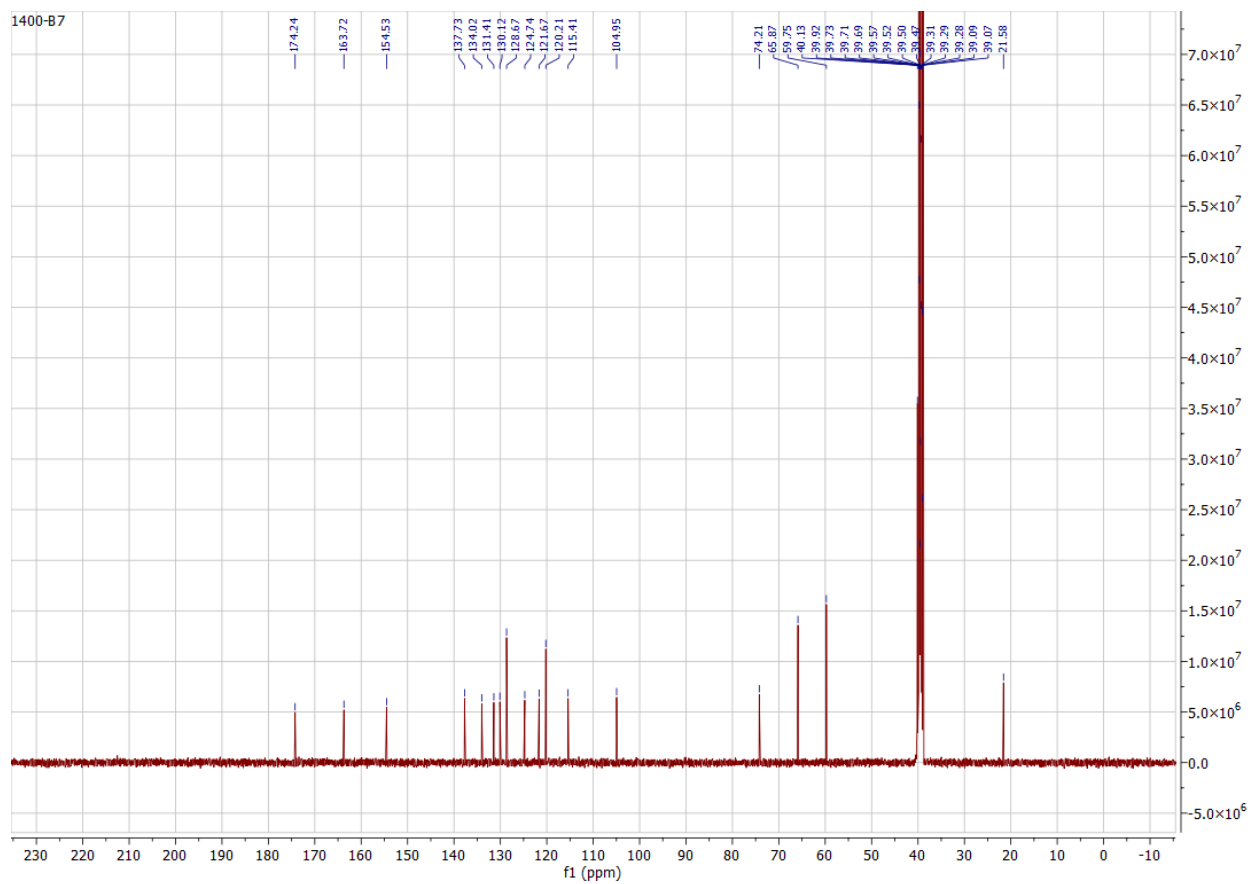




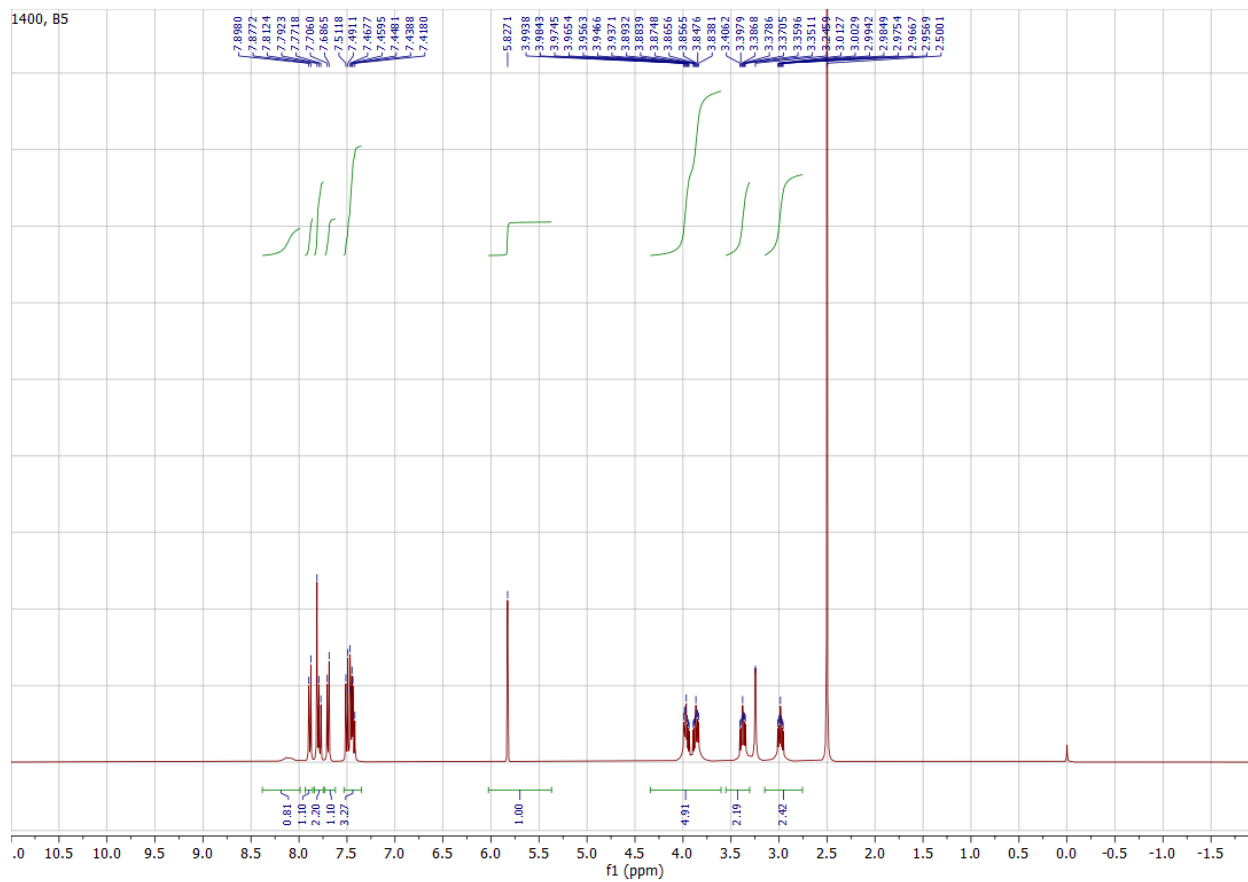
**Figure S<sub>42</sub>:** <sup>13</sup>C-NMR spectra of 4-hydroxy-3-(morpholino(4-nitrophenyl)methyl)-2H-chromen-2-one



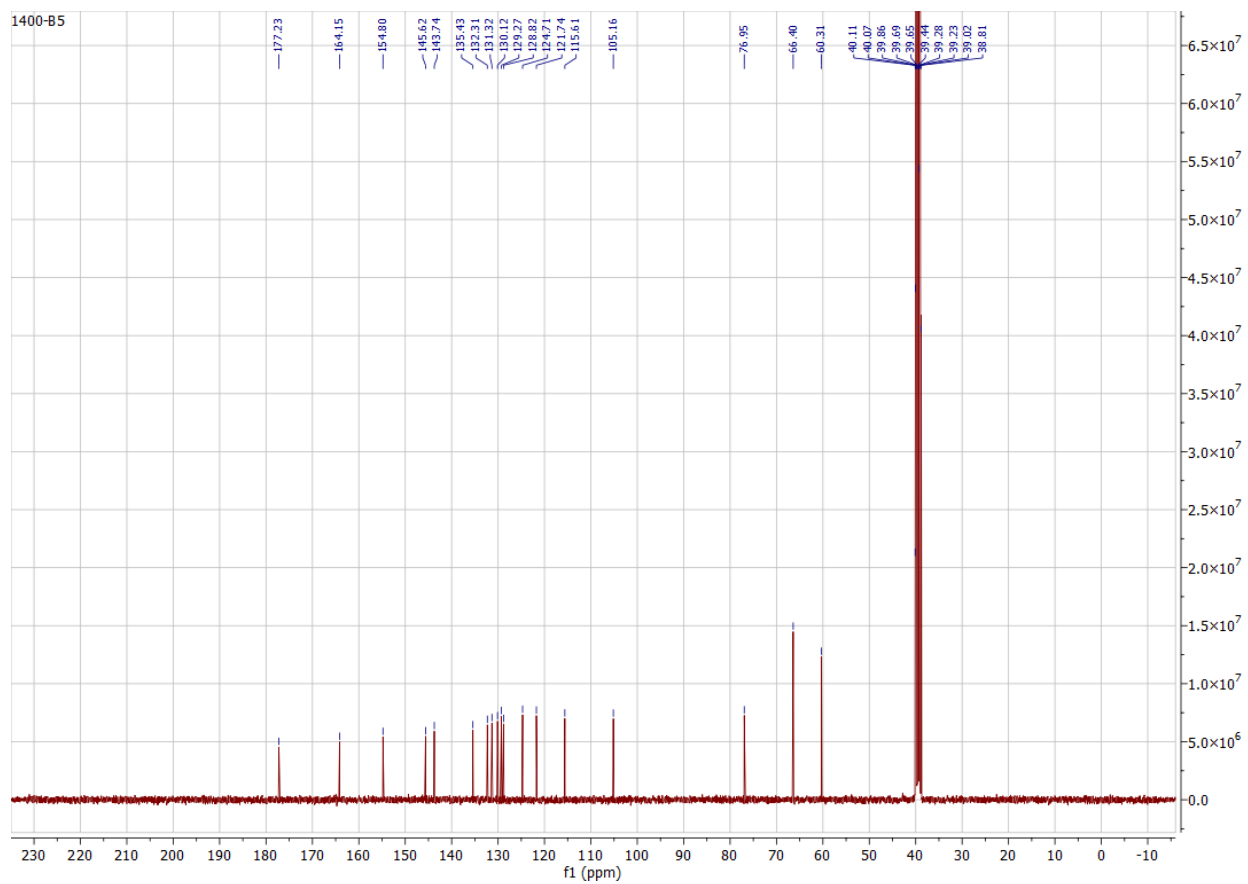
**Figure S<sub>43</sub>:** <sup>1</sup>H-NMR spectra of 4-hydroxy-3-(morpholino(p-tolyl)methyl)-2H-chromen-2-one



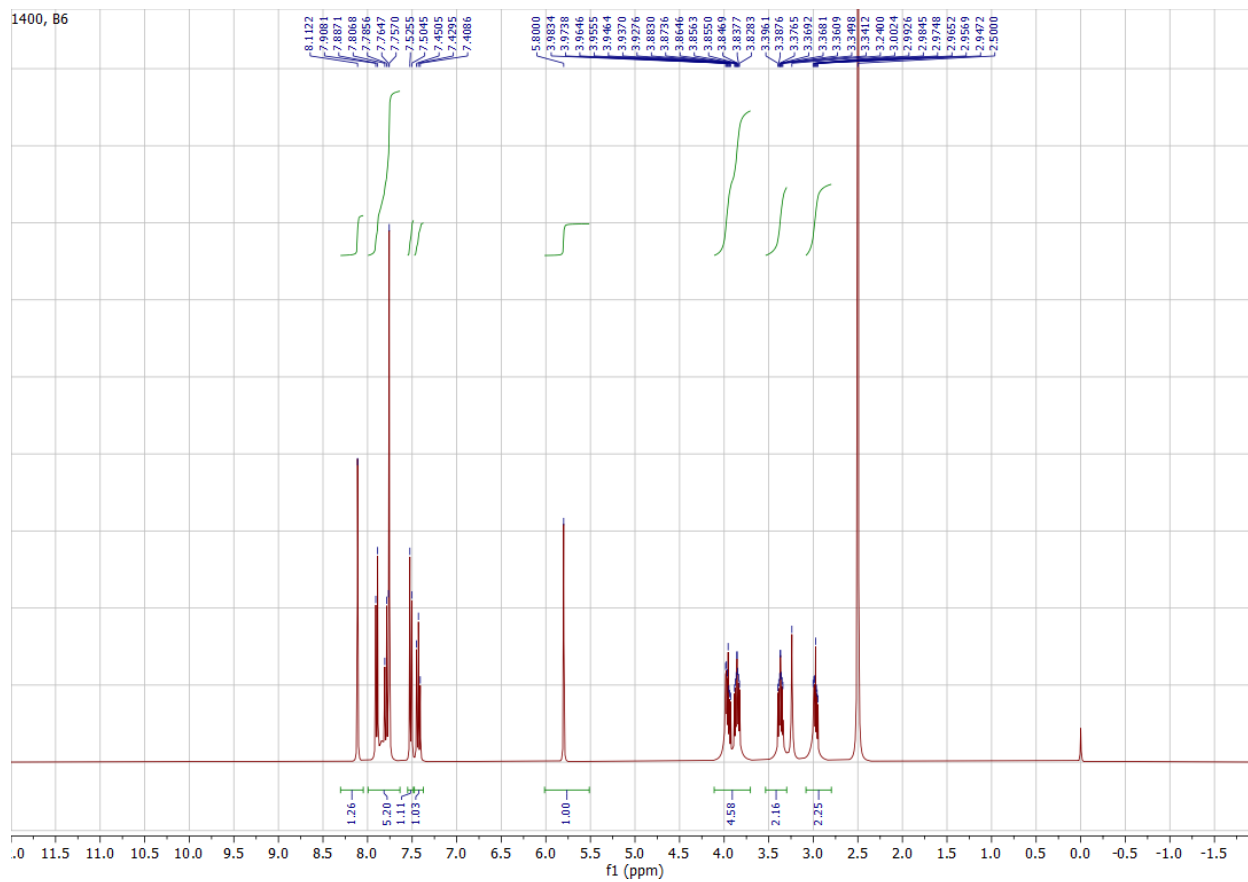
**Figure S44:**  $^{13}\text{C}$ -NMR spectra of 4-hydroxy-3-(morpholino(p-tolyl)methyl)-2H-chromen-2-one



**Figure S<sub>45</sub>:** <sup>1</sup>H-NMR spectra of 3-((2,4-dichlorophenyl)(morpholino)methyl)-4-hydroxy-2H-chromen-2-one

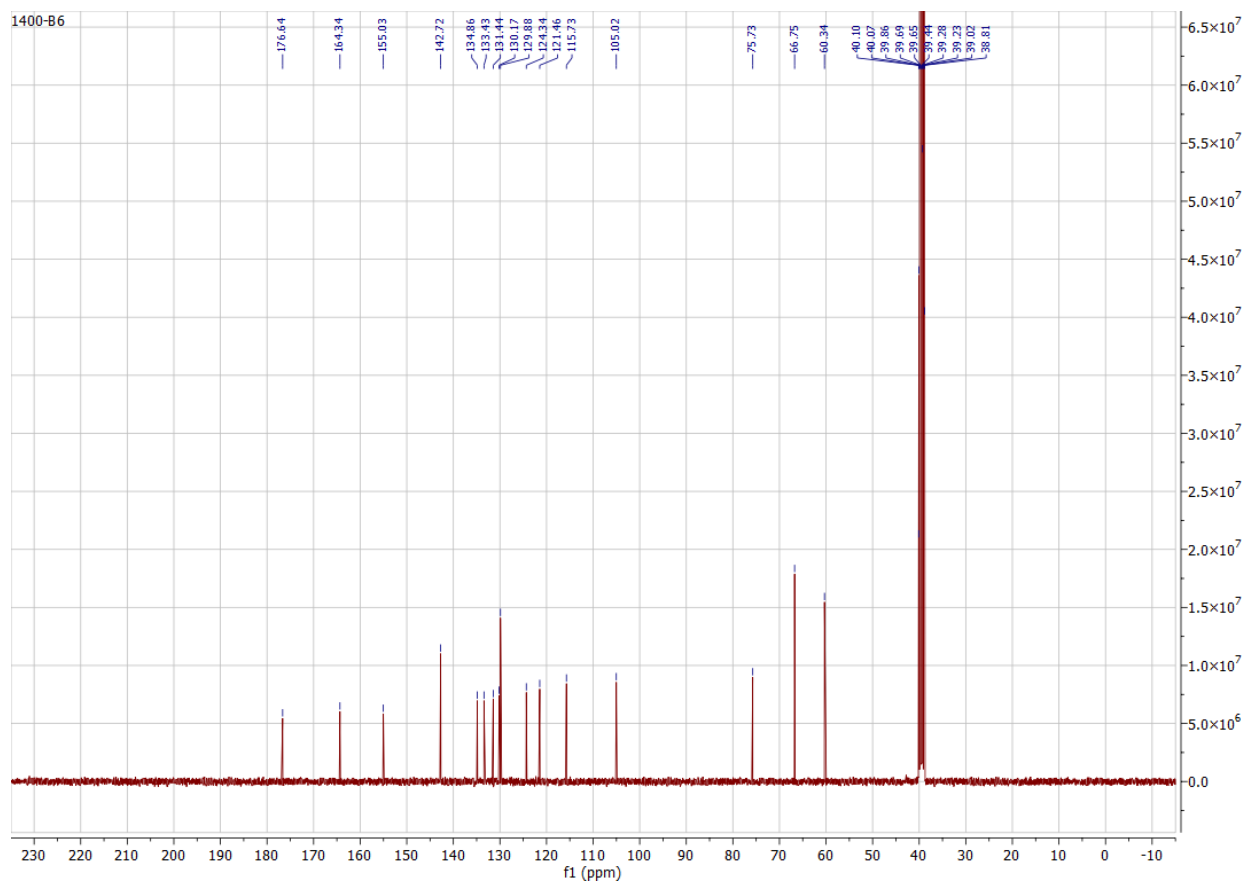


**Figure S<sub>46</sub>:** <sup>13</sup>C-NMR spectra of 3-((2,4-dichlorophenyl) (morpholino)methyl)-4-hydroxy-2H-chromen-2-one



**Figure S<sub>47</sub>:** <sup>1</sup>H-NMR spectra of 3-((3,5-dichlorophenyl) (morpholino)methyl)-4-hydroxy-2H-chromen-2-one





**Figure S<sub>48</sub>:** <sup>13</sup>C-NMR spectra of 3-((3,5-dichlorophenyl) (morpholino) methyl)-4-hydroxy-2H-chromen-2-one