

Supplementary Material

Synthesis, characterization, and bioassay of novel substituted 1-(3-(1,3-thiazol-2-yl)phenyl)-5-oxopyrrolidines

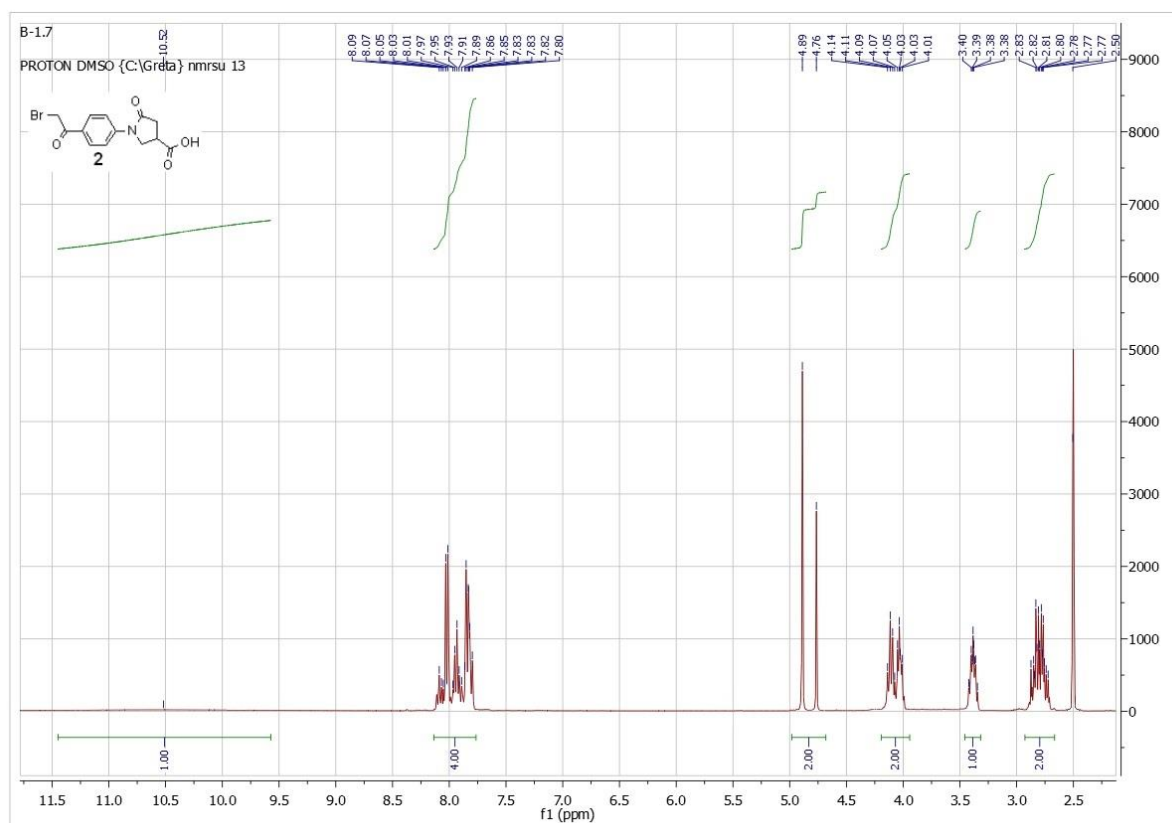
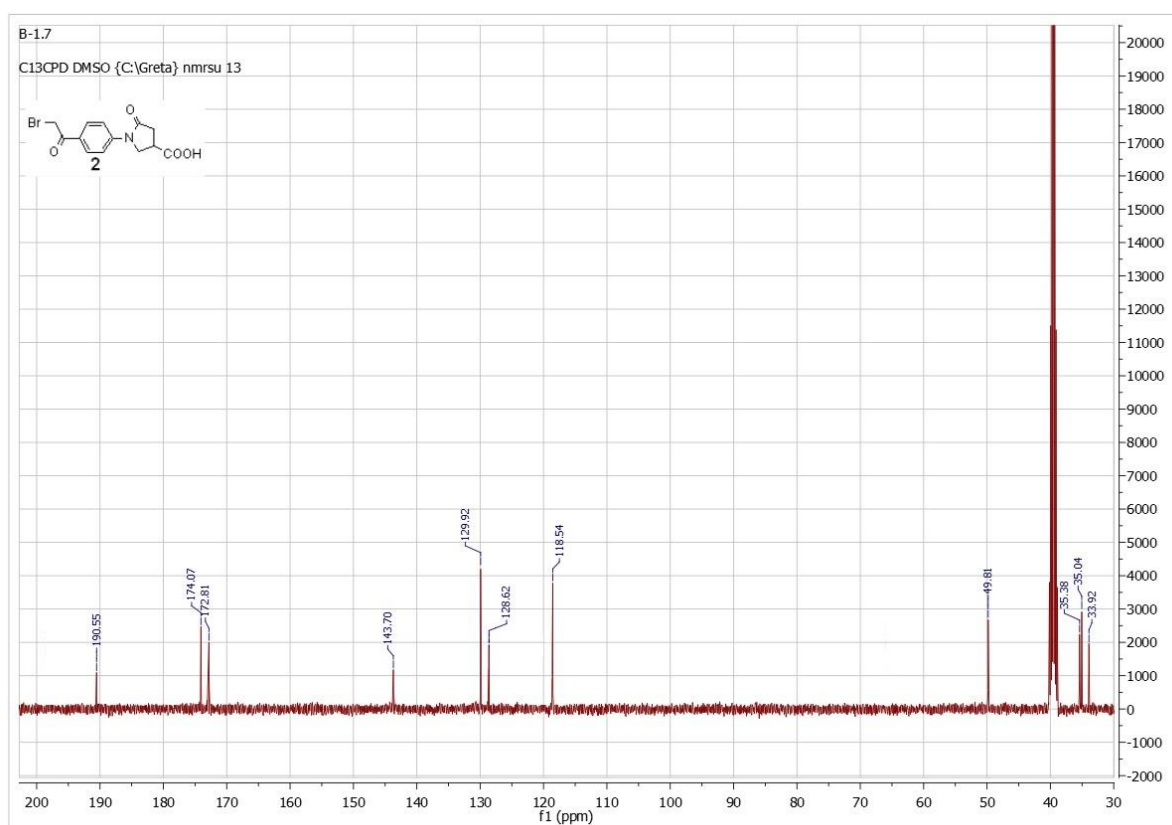
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1-(4-(2-Bromoacetyl)phenyl)-5-oxopyrrolidine-3-carboxylic acid (2)Figure S1: ¹H NMR of compound 2Figure S2: ¹³C NMR of compound 2

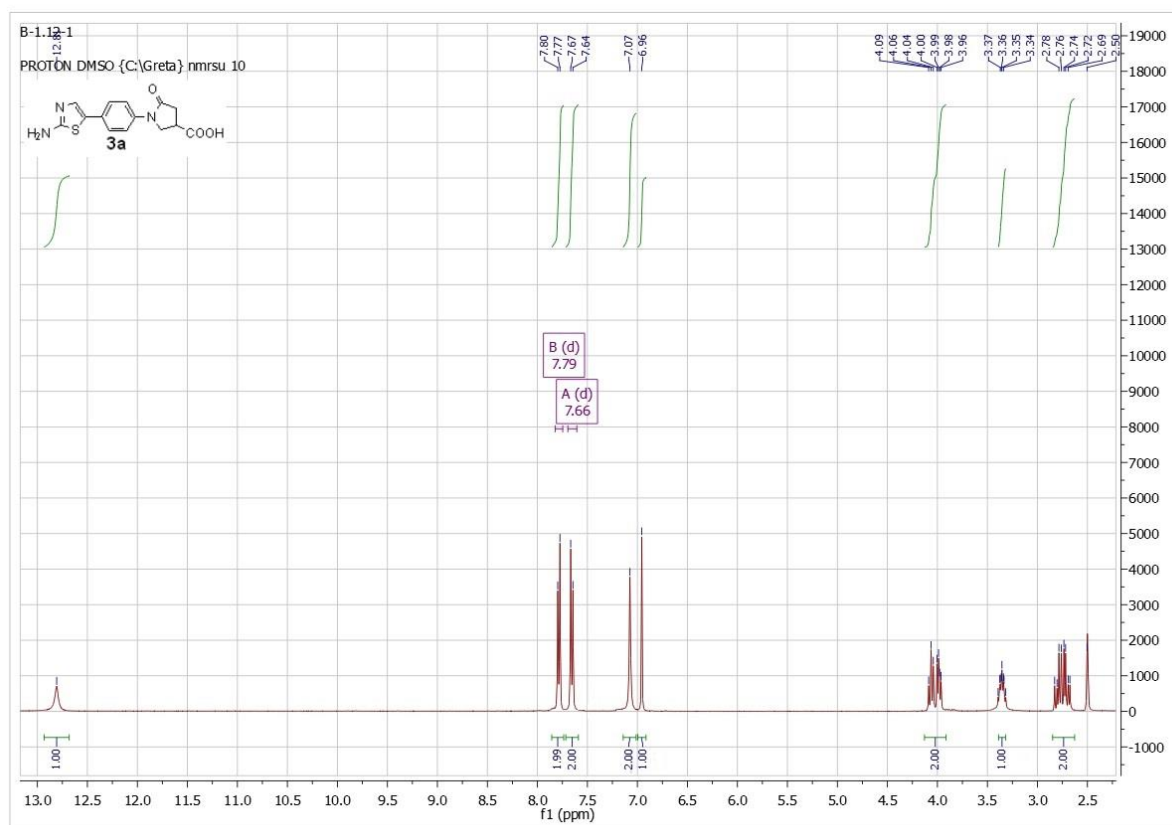
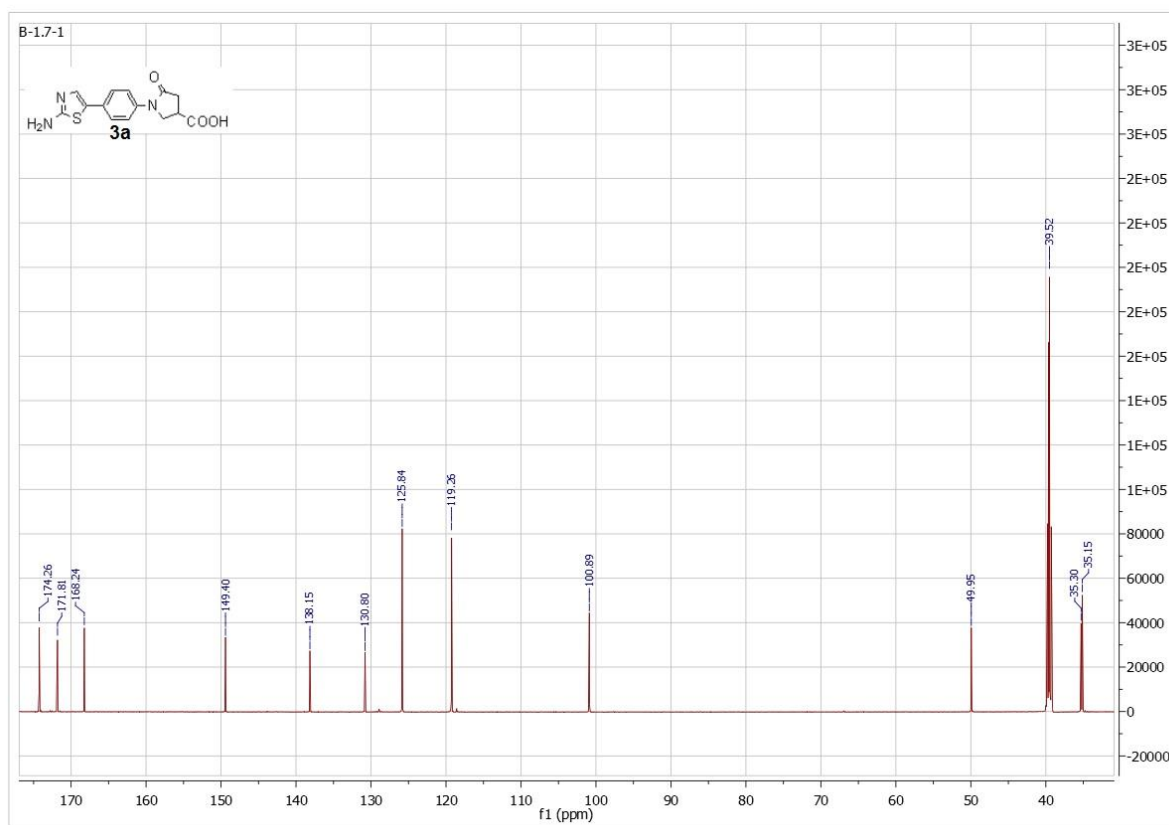
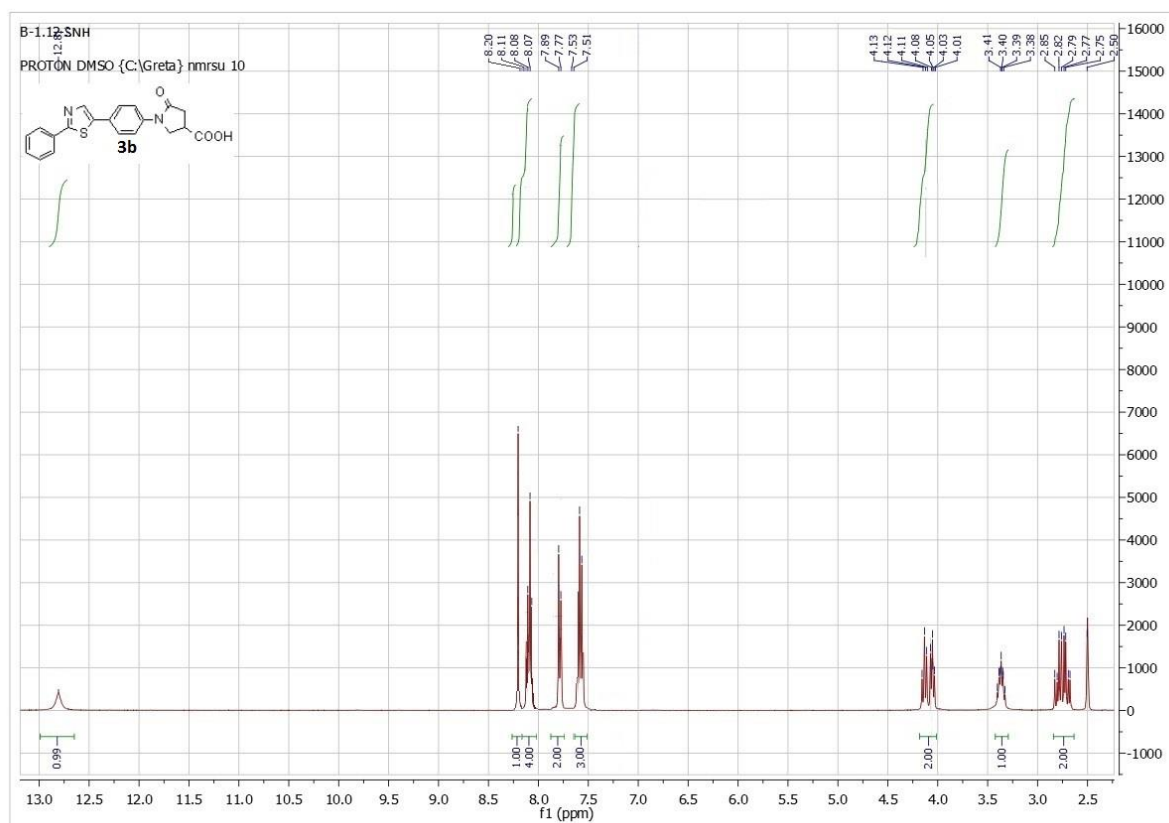
1-(4-(2-Aminothiazol-5-yl)phenyl)-5-oxopyrrolidine-3-carboxylic acid (3 a)

Figure S3: ¹H NMR of compound **3 a**

Figure S4: ^{13}C NMR of compound **3 a**

5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carboxylic acid (**3 b**)

Figure S5: ^1H NMR of compound **3 b**

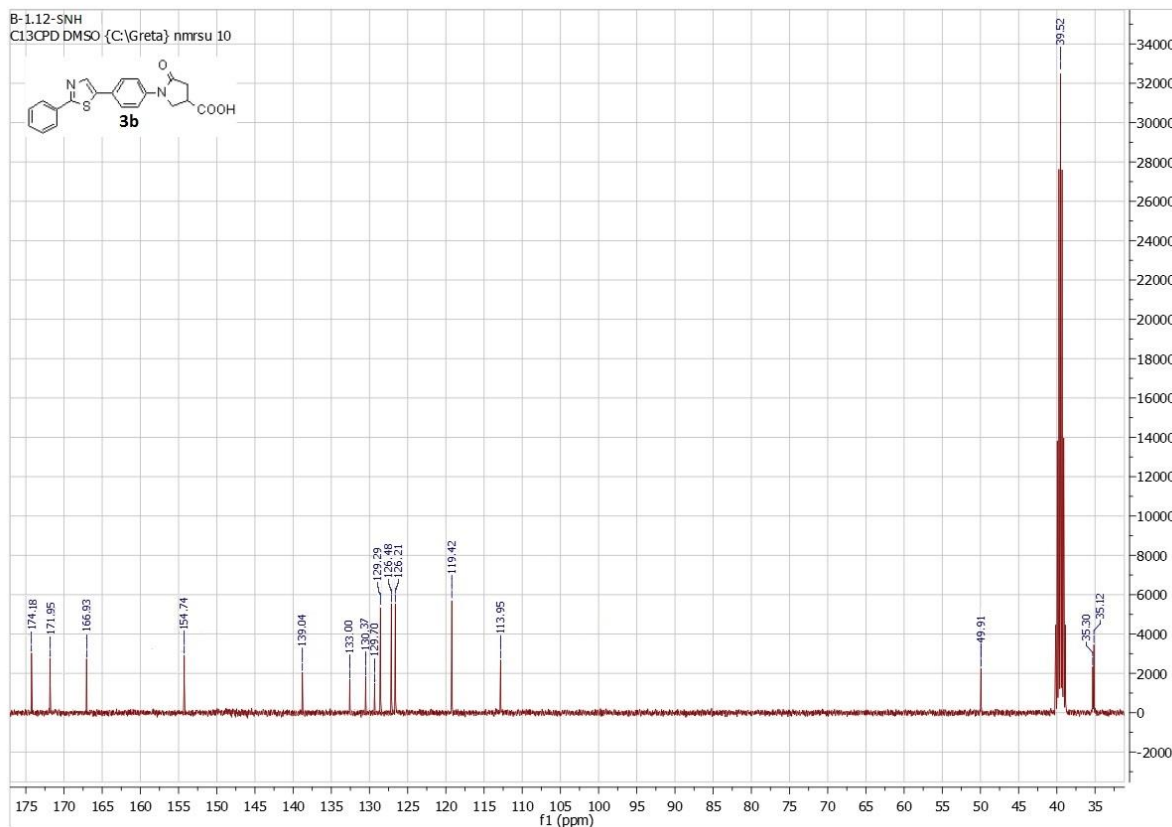


Figure S6: ^{13}C NMR of compound **3b**

1-(4-(2-((2-Carboxyethyl)-4-methylanilino)-1,3-thiazol-5-yl)phenyl)-5-oxo-3-pyrrolidinecarboxylic acid (3c**)**

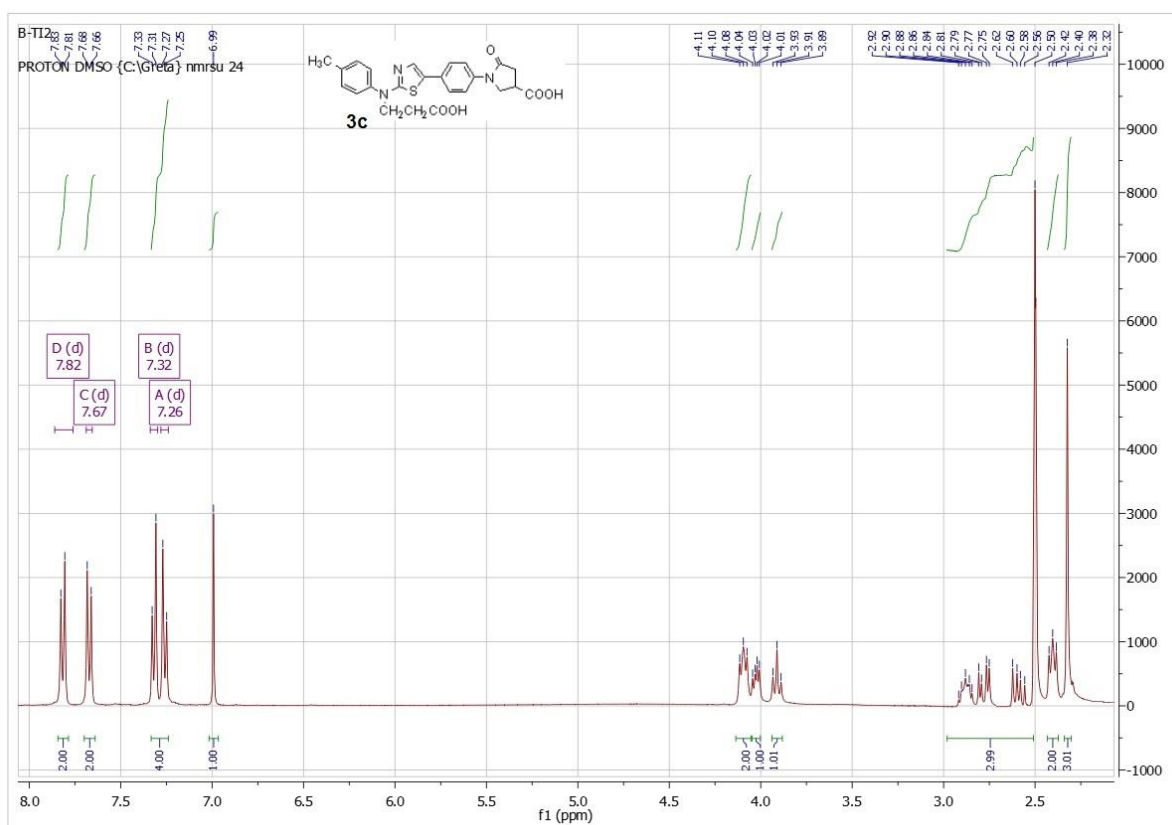


Figure S7: ¹H NMR of compound **3 c**

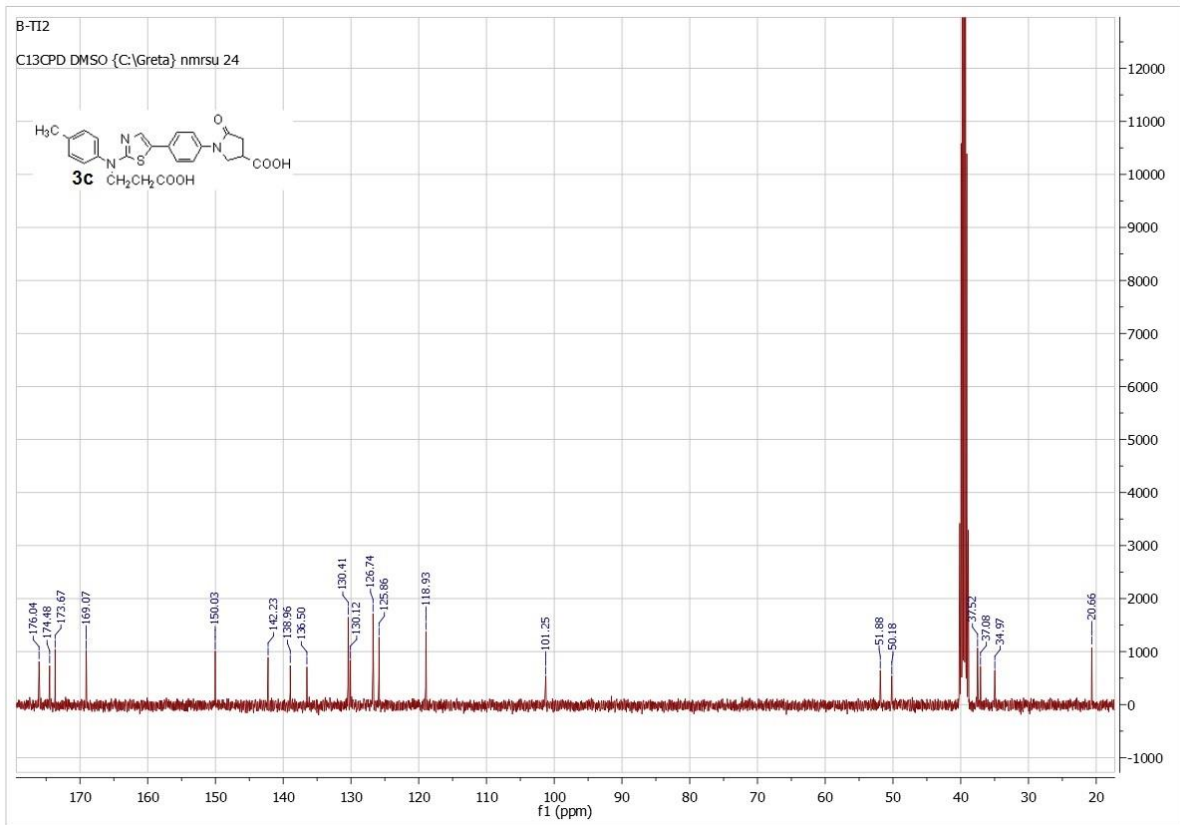


Figure S8: ¹³C NMR of compound **3 c**

Methyl 1-(4-(2-aminothiazol-5-yl)phenyl)-5-oxopyrrolidine-3-carboxylate (**4 a**)

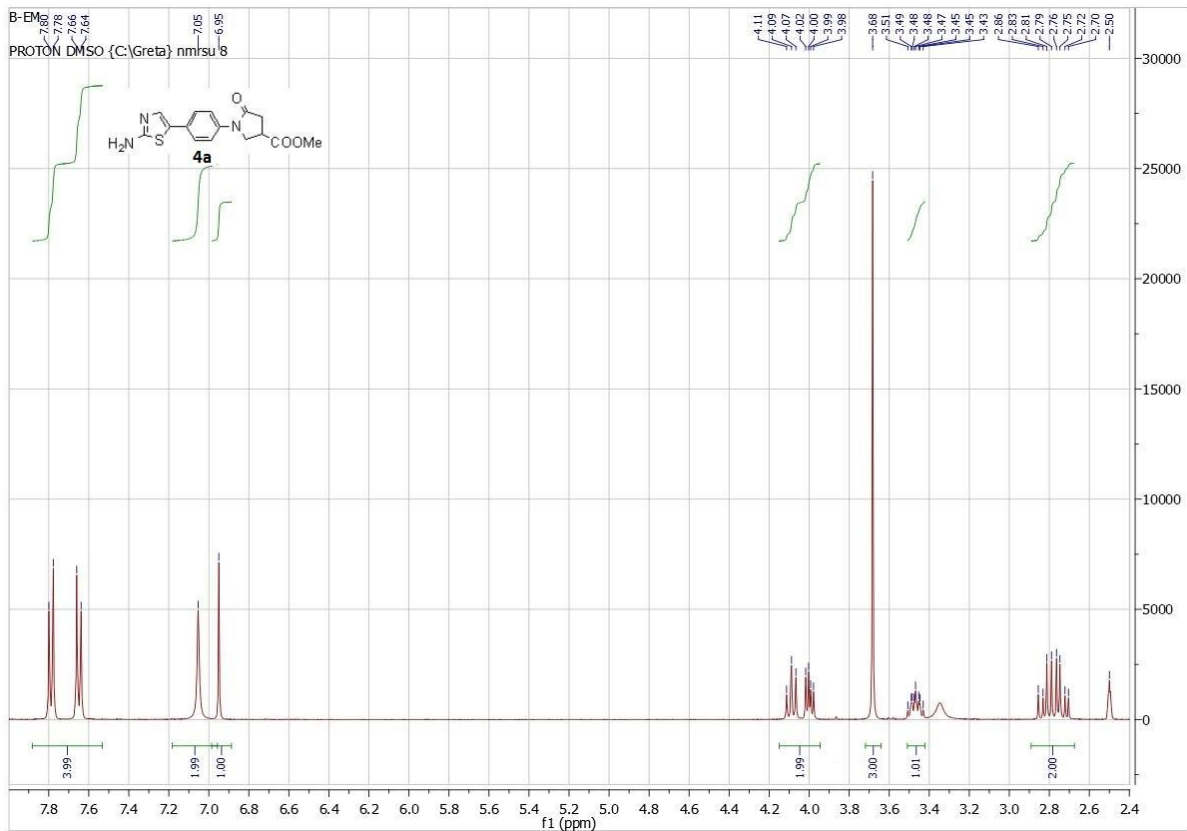


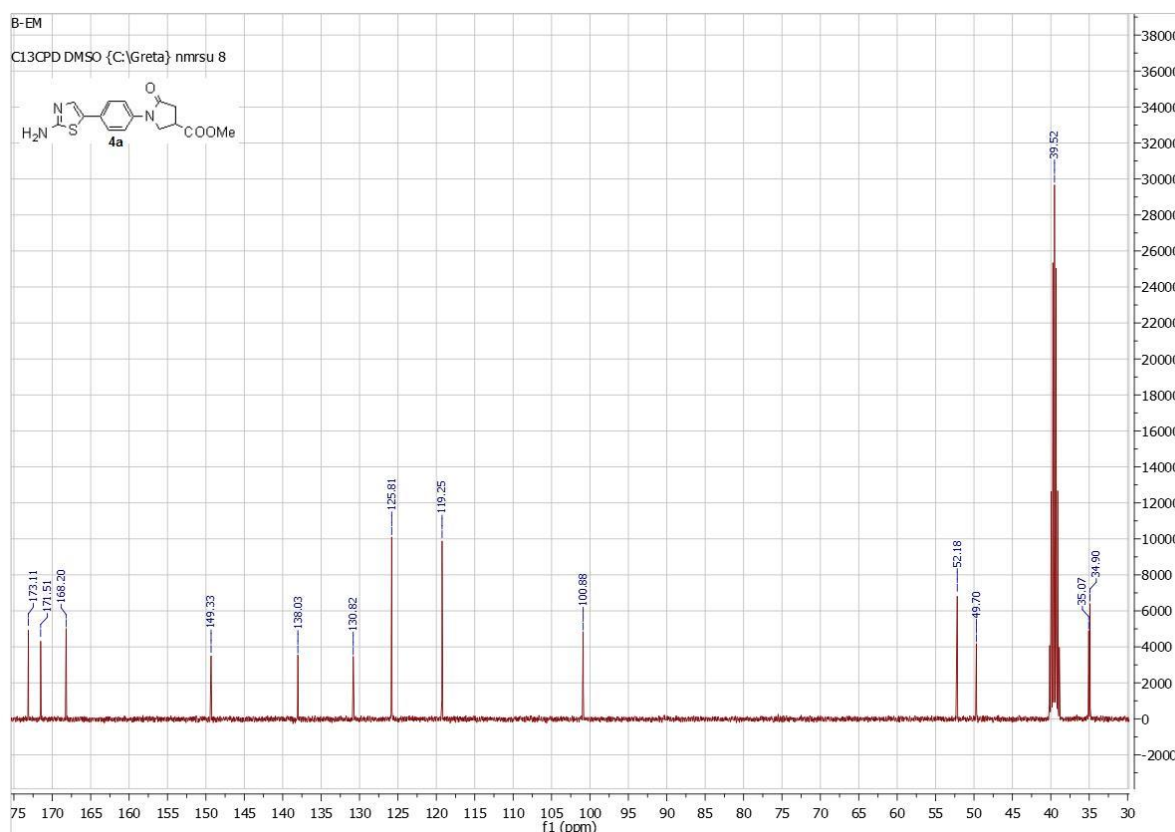
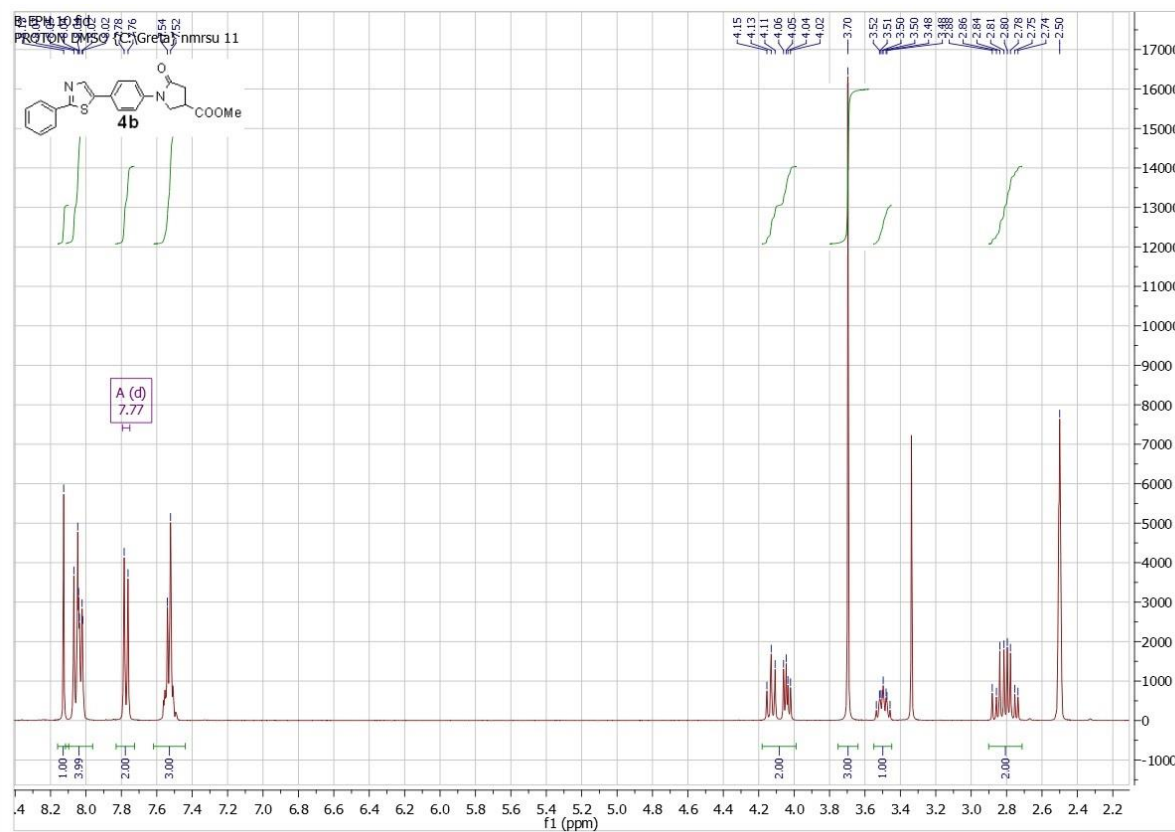
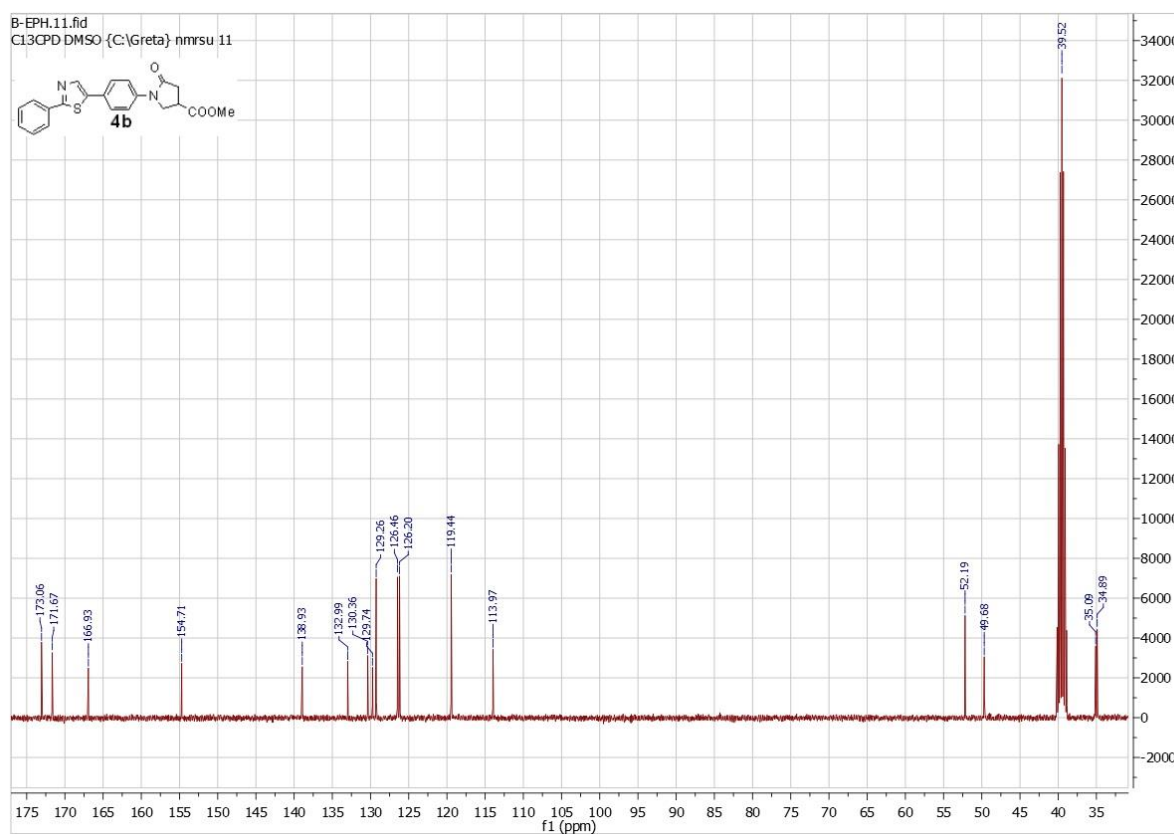
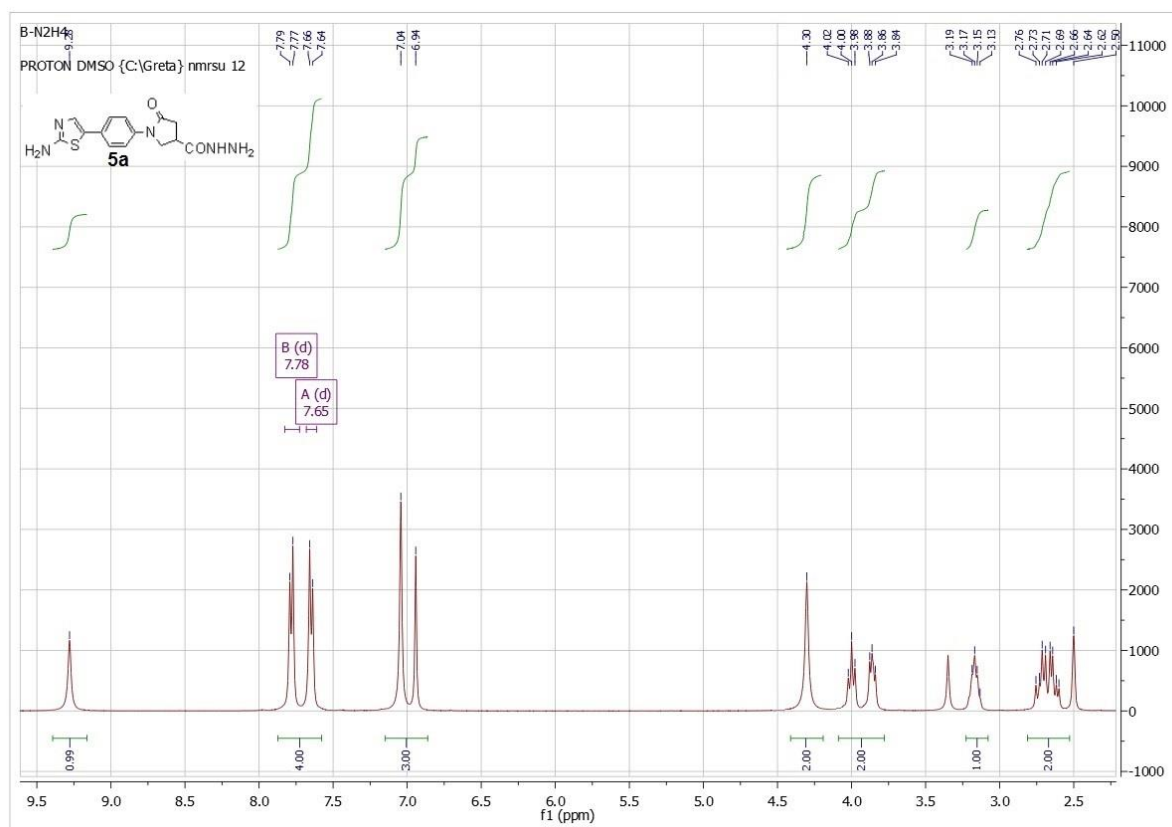
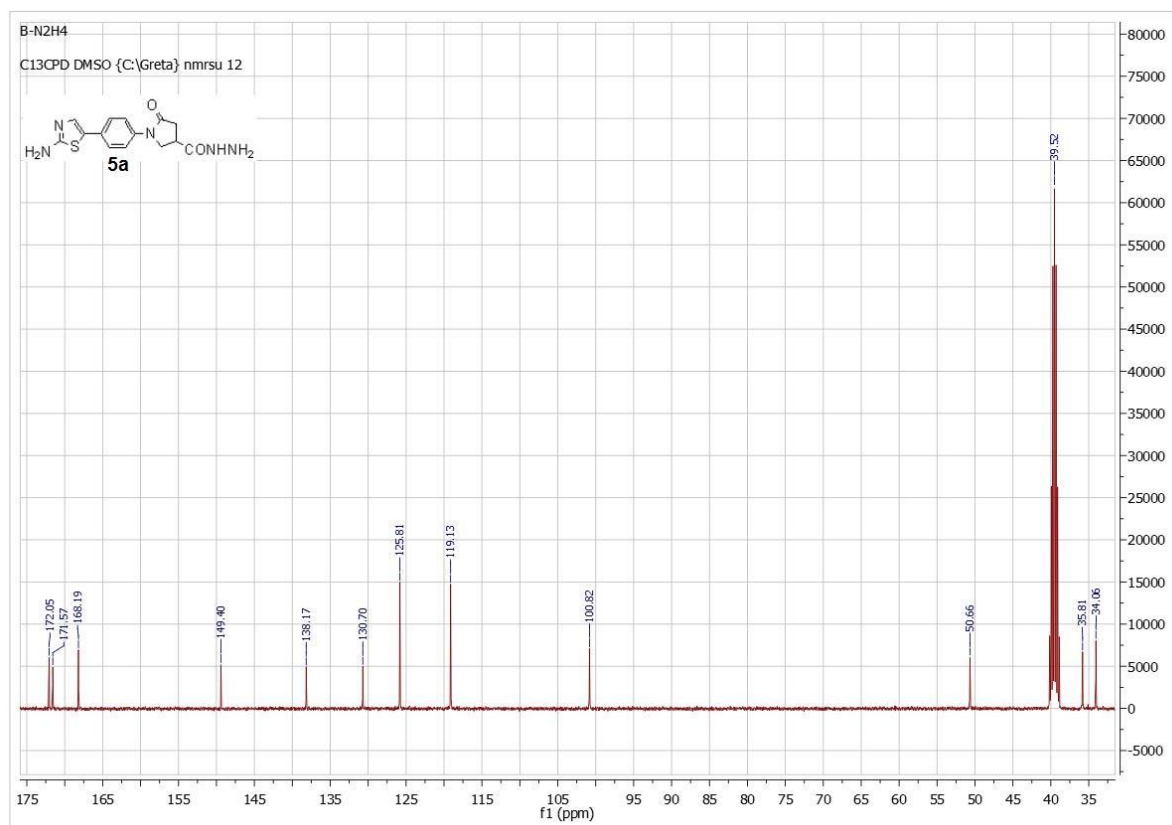
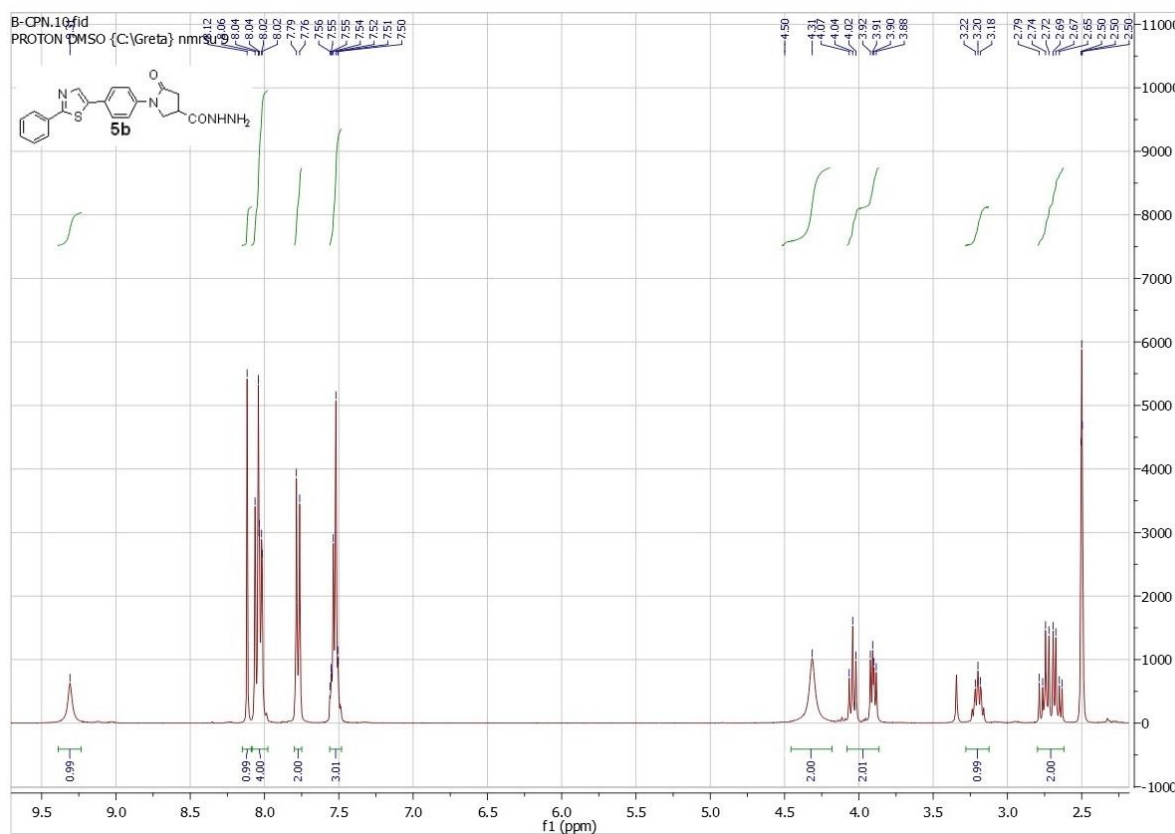
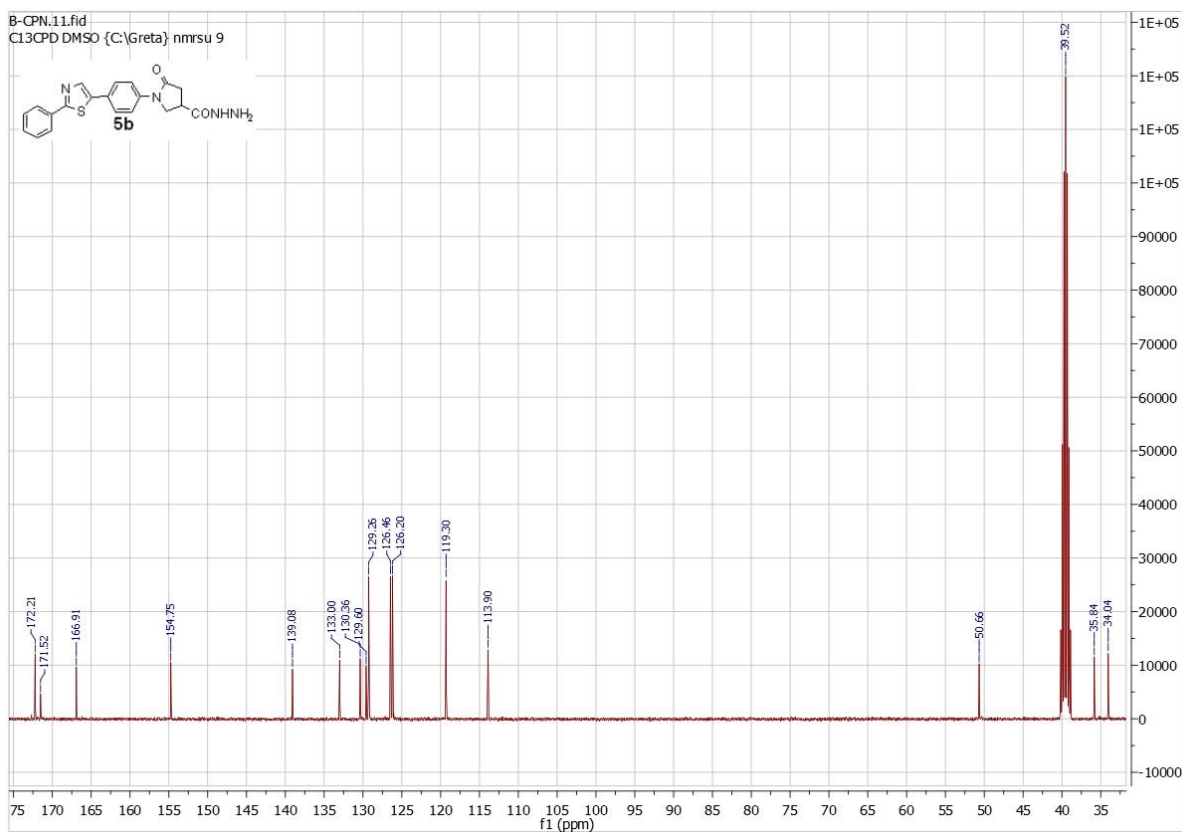
Figure S9: ^1H NMR of compound **4 a**Figure S10: ^{13}C NMR of compound **4 a**Methyl 5-oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carboxylate (**4 b**)

Figure S11: ^1H NMR of compound **4 b**Figure S12: ^{13}C NMR of compound **4 b**

1-(4-(2-Aminothiazol-5-yl)phenyl)-5-oxopyrrolidine-3-carbohydrazide (**5 a**)

Figure S13: ^1H NMR of compound **5a**Figure S14: ^{13}C NMR of compound **5a**

5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carbohydrazide (5 b):Figure S15: ¹H NMR of compound 5 bFigure S16: ¹³C NMR of compound 5 b

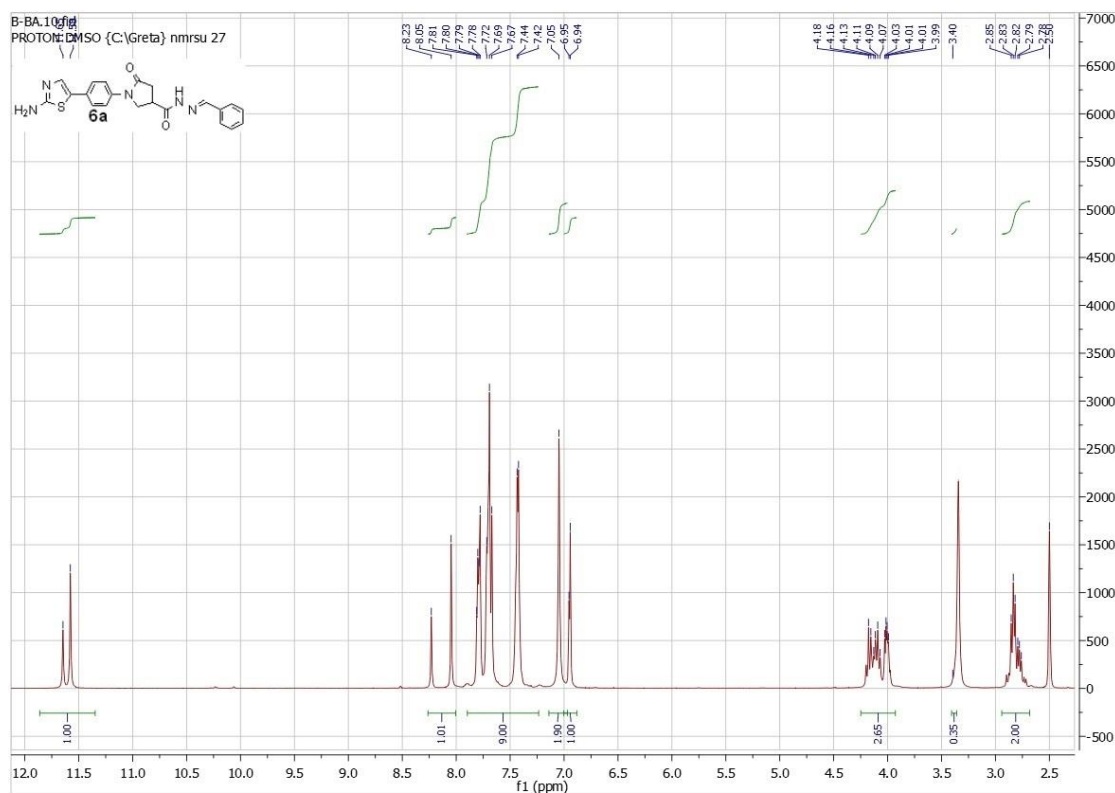
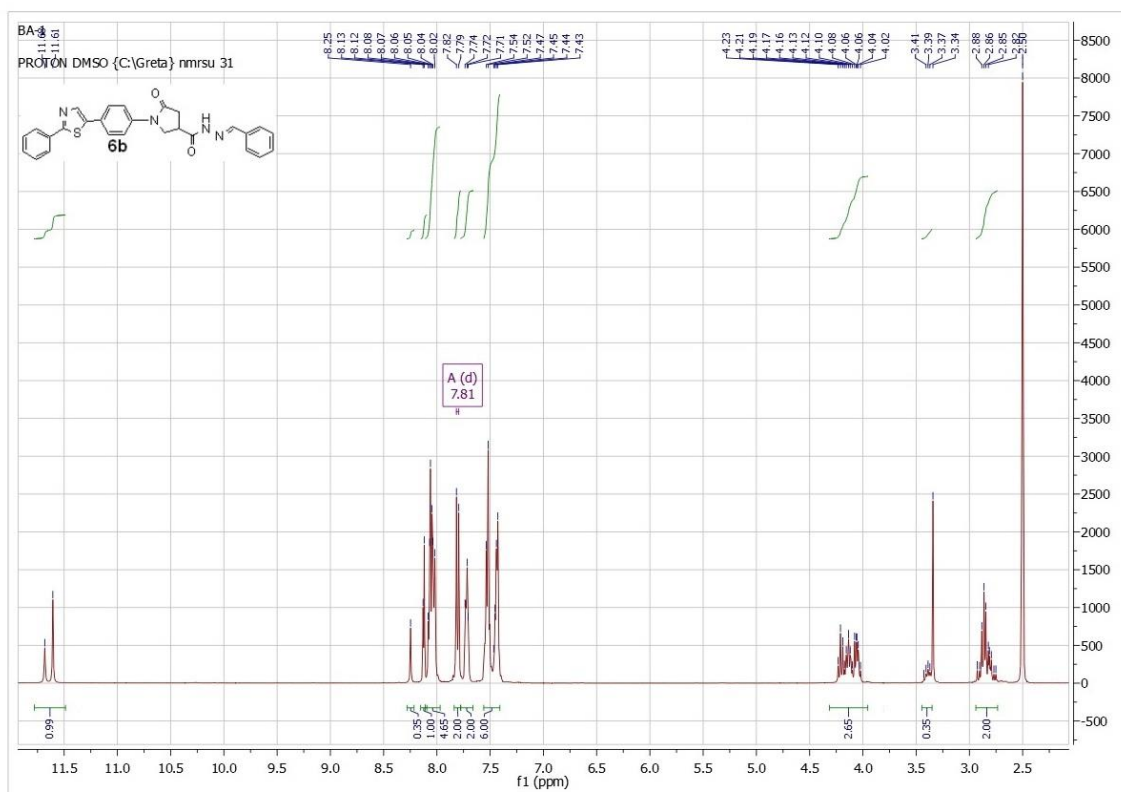
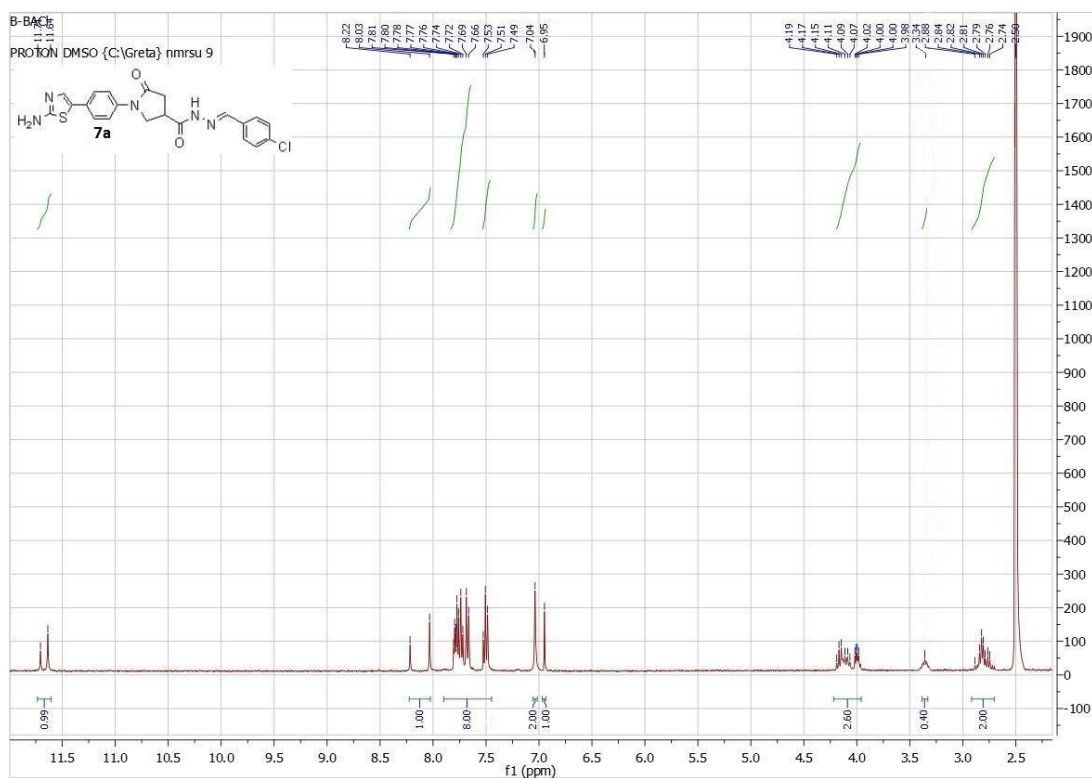
1-(4-(2-Aminothiazol-5-yl)phenyl)-3-(benzylidenehydrazinocarbonyl)-5-oxopyrrolidine (6 a)

Figure S17: ¹H NMR of compound **6 a**

3-(Benzylidenehydrazinocarbonyl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (6 b)

Figure S18: ¹H NMR of compound **6b****1-(4-(2-Aminothiazol-5-yl)phenyl)-3-(4-chlorobenzylidenehydrazinocarbonyl)-5-oxopyrrolidine (7a)**Figure S19: ¹H NMR of compound **7a**

3-(3-Chlorobenzylidenehydrazinocarbonyl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (7 b)

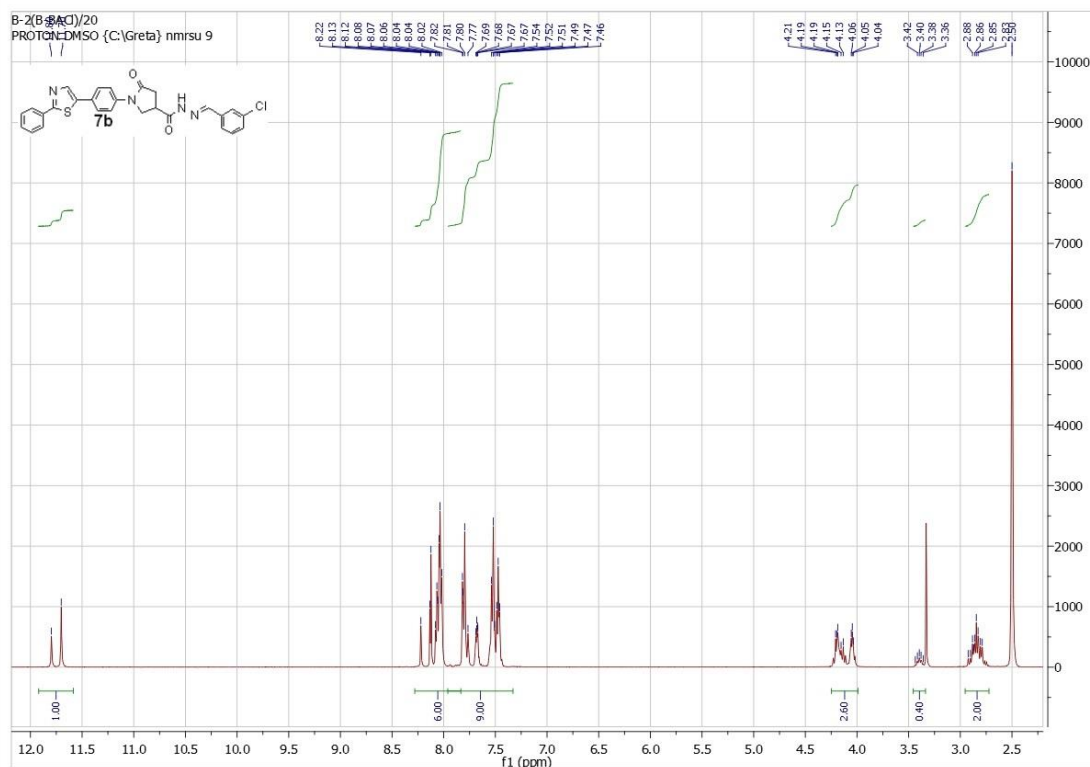


Figure S20: ¹H NMR of compound 7 b

1-(4-(2-Aminothiazol-5-yl)phenyl)-3-(4-nitrobenzylidenehydrazinocarbonyl)-5-oxopyrrolidine (8 a)

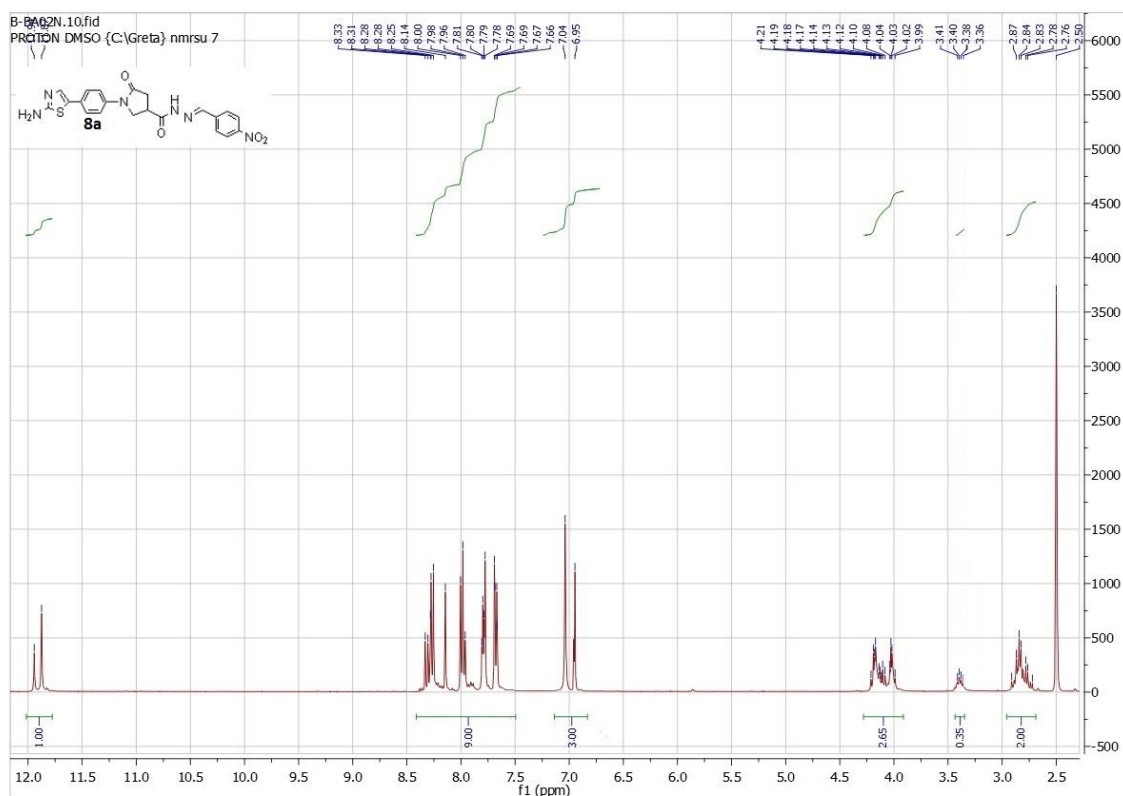


Figure S21: ¹H NMR of compound 8 a

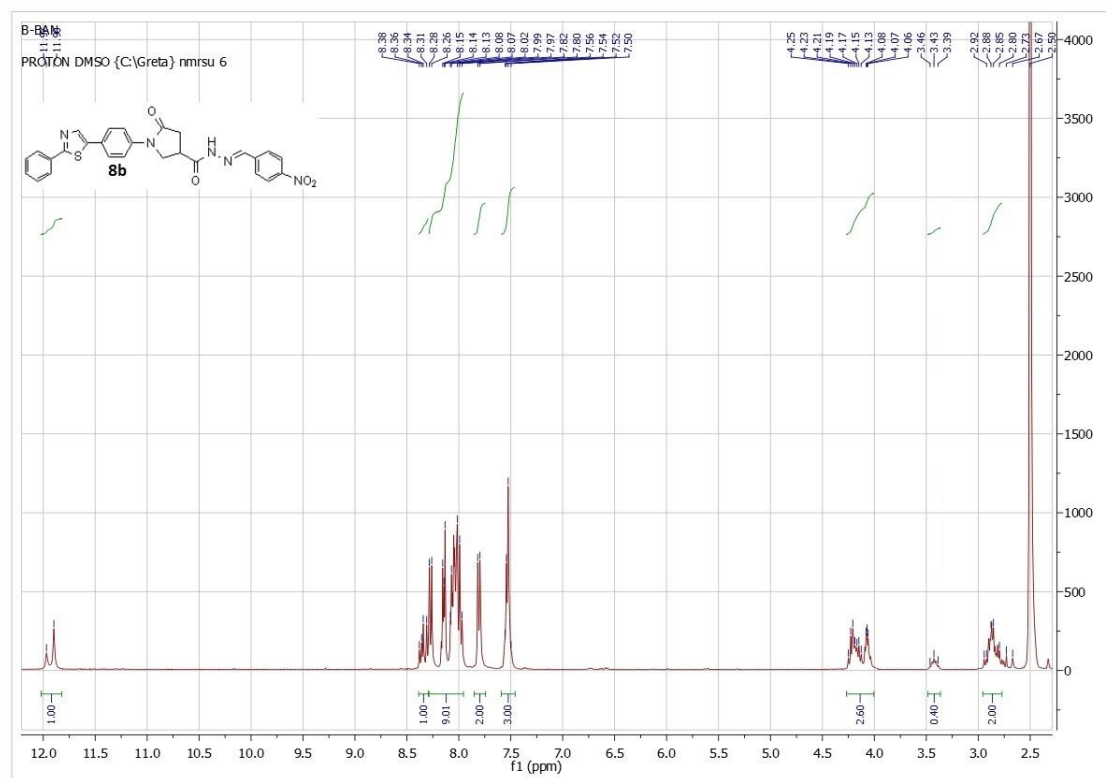
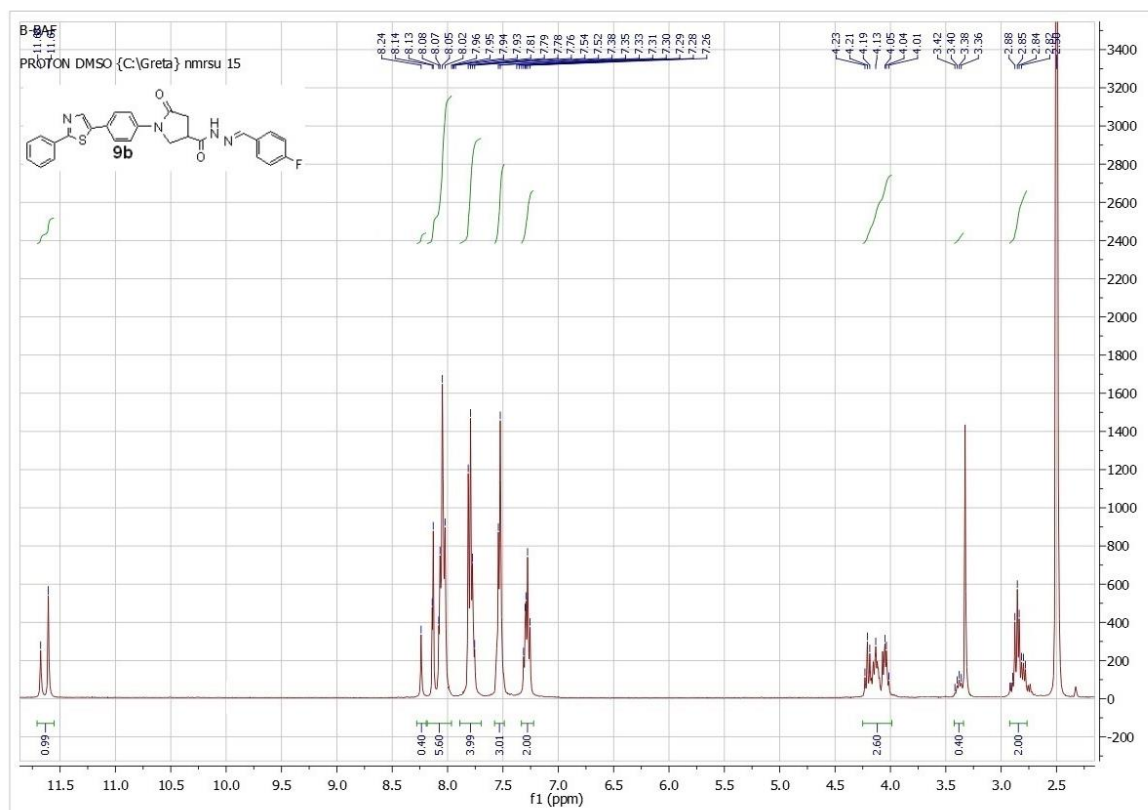
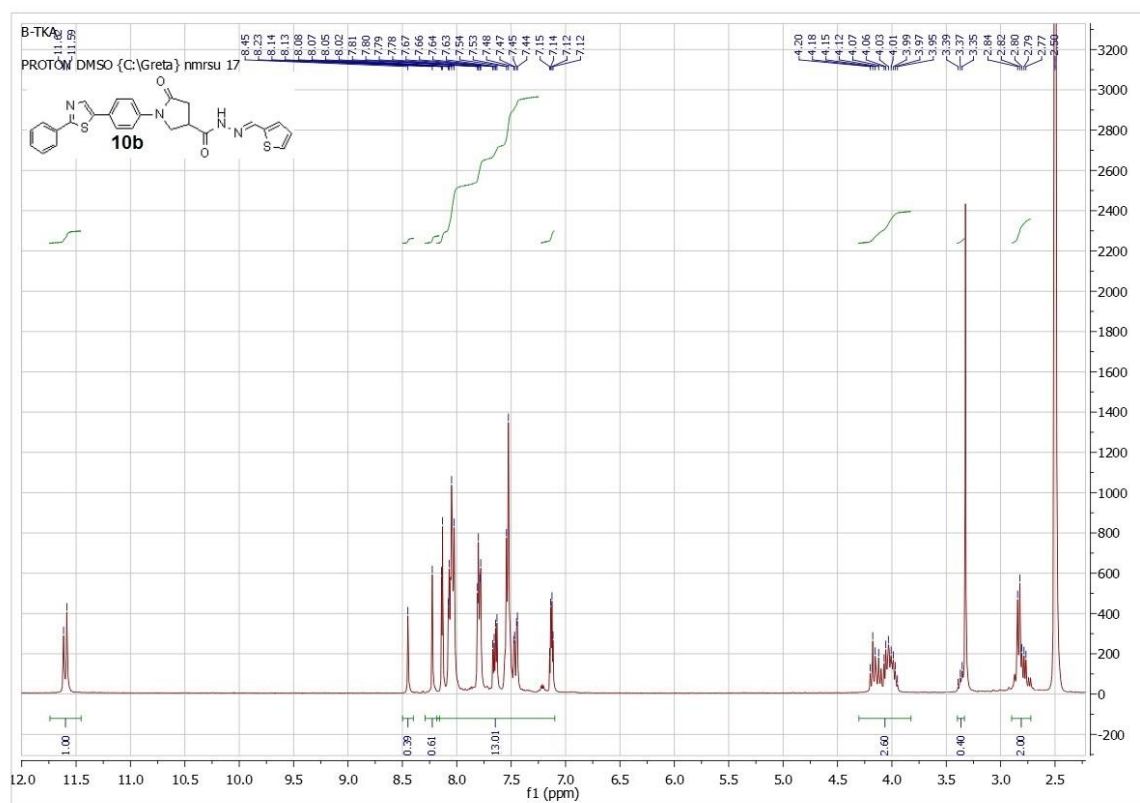
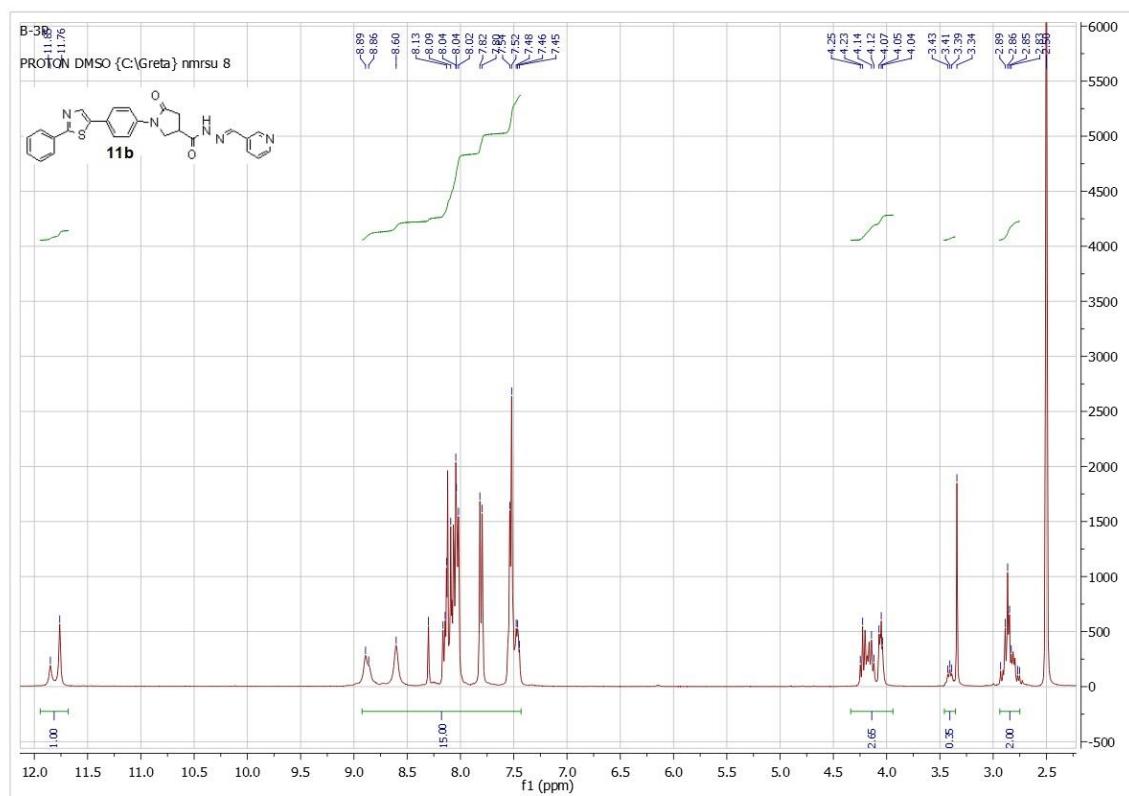
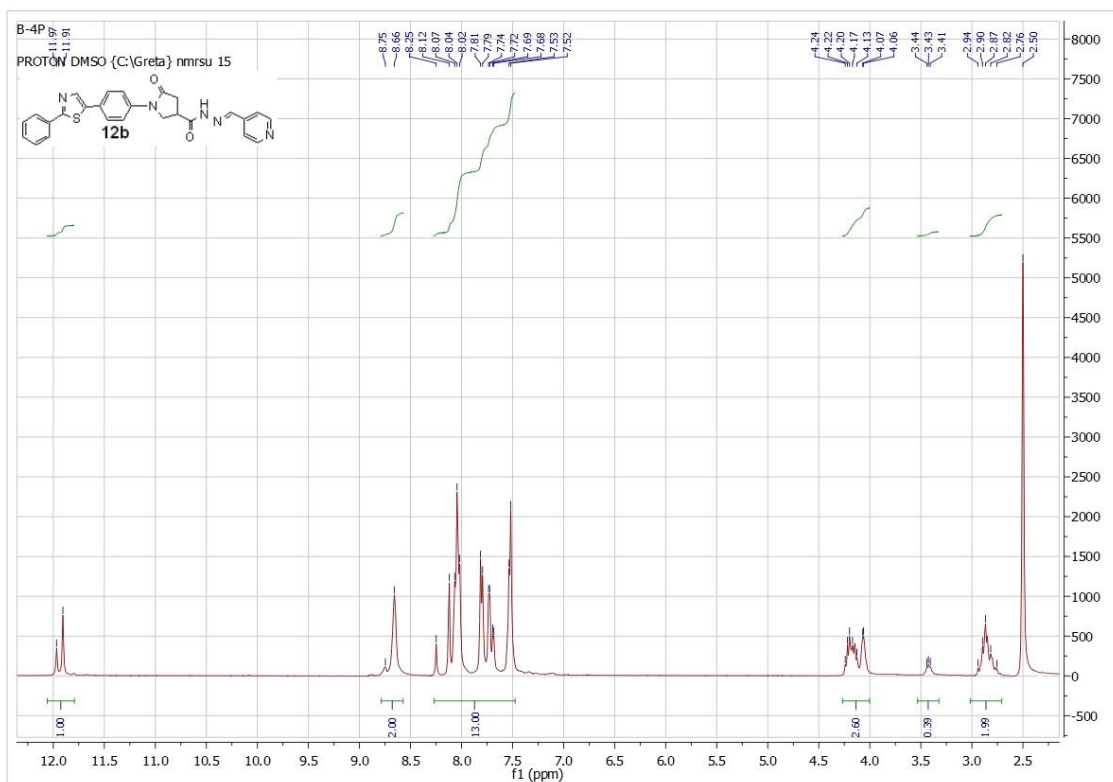
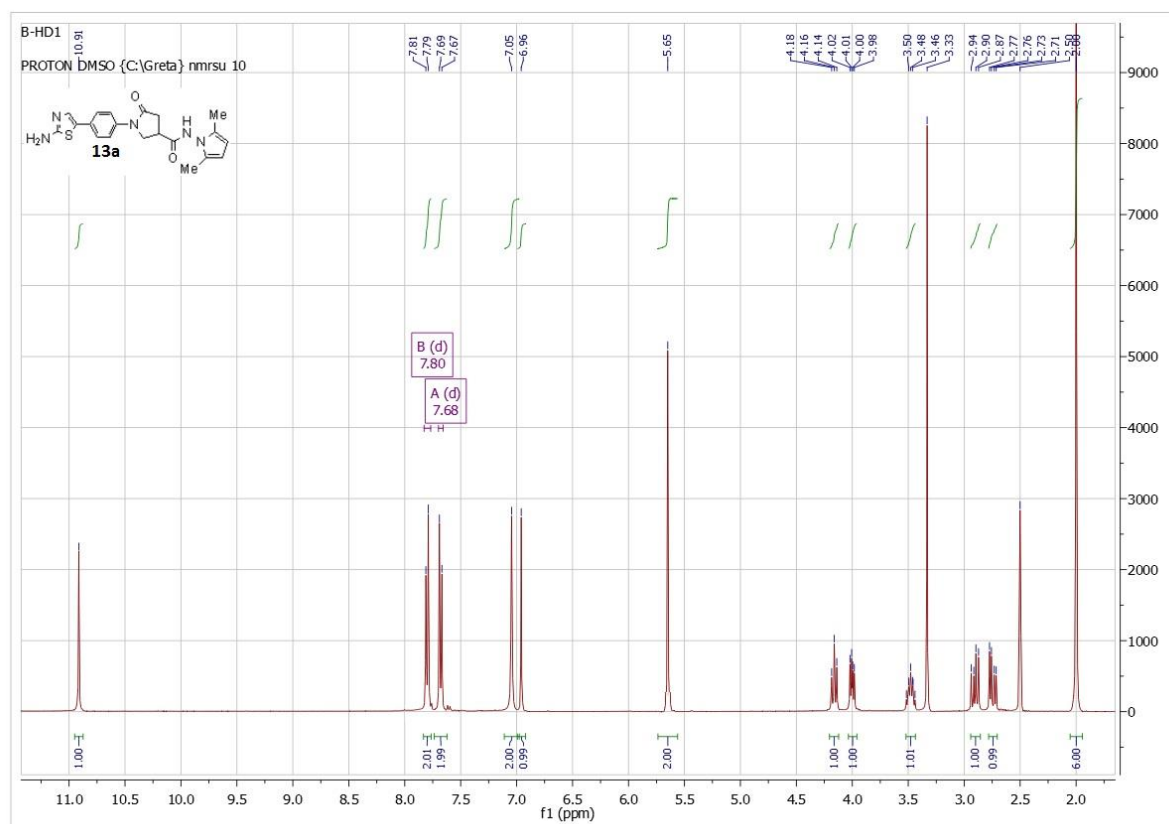
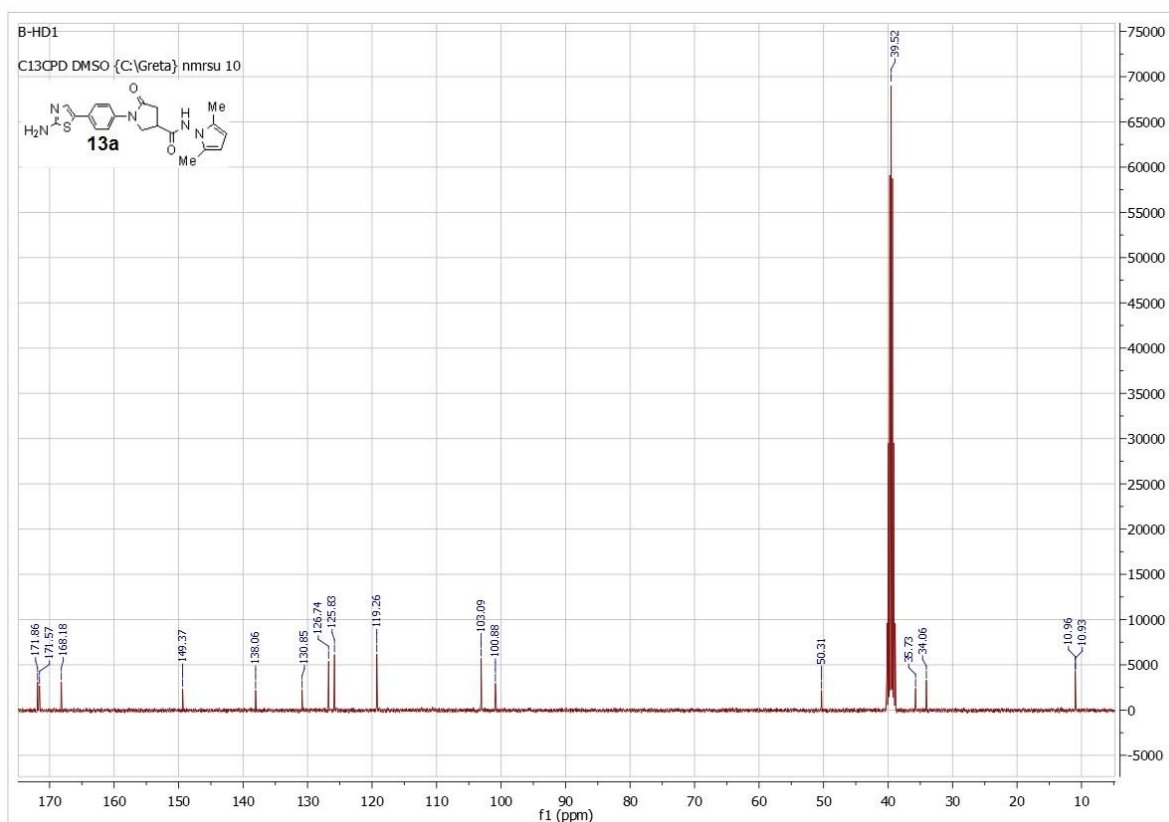
3-(4-Nitrobenzylidenehydrazinocarbonyl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (8 b)

Figure S22: ^1H NMR of compound **8 b**

3-(4-Fluorobenzylidenehydrazinocarbonyl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (9 b)

Figure S23: ^1H NMR of compound **9 b****5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)-N'-(thiophen-2-ylmethylene)pyrrolidine-3-carbohydrazide (10 b)**Figure S24: ^1H NMR of compound **10 b**

5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)-N-(pyridin-3-ylmethylene)pyrrolidine-3-carbohydrazide (11 b)Figure S25: ¹H NMR of compound **11 b****5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)-N-(pyridin-4-ylmethylene)pyrrolidine-3-carbohydrazide (12 b)**Figure S26: ¹H NMR of compound **12 b**

1-(4-(2-Aminothiazol-5-yl)phenyl)-N-(2,5-dimethyl-1H-pyrrol-1-yl)-5-oxopyrrolidine-3-carboxamide (13a)Figure S27: ¹H NMR of compound 13 aFigure S28: ¹³C NMR of compound 13 a

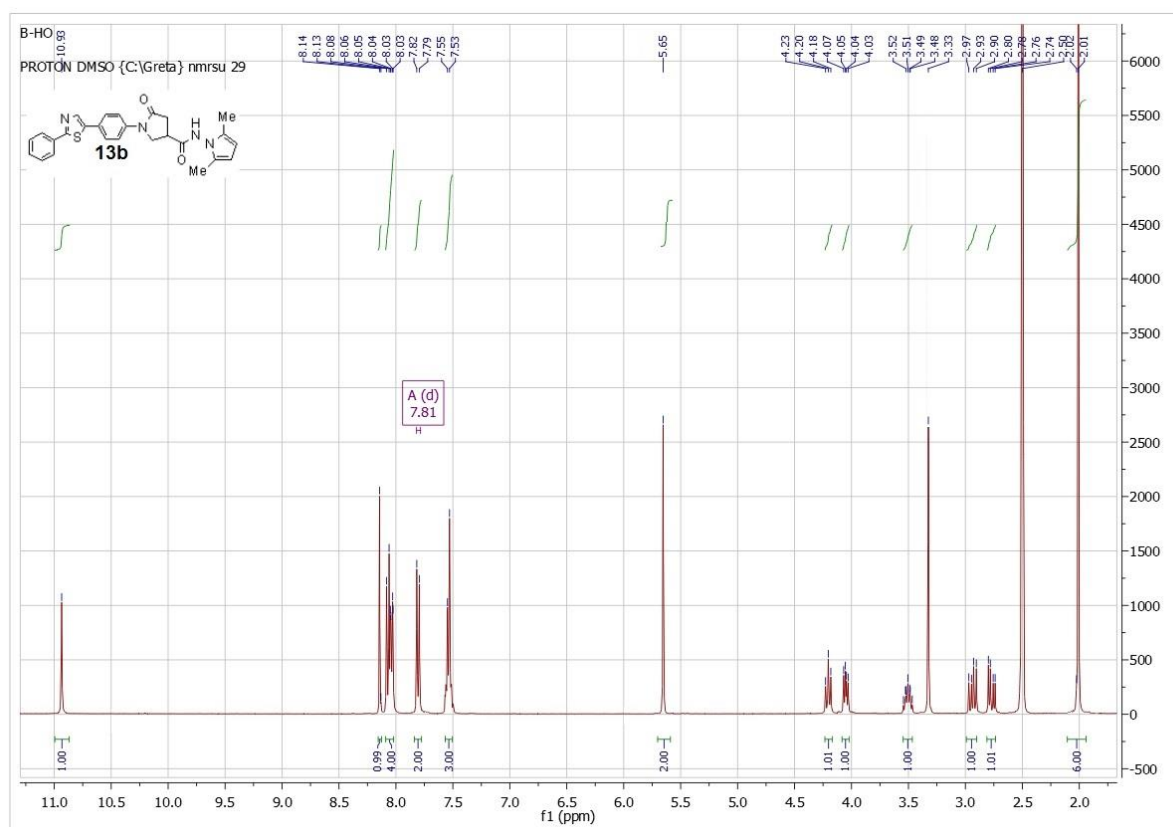
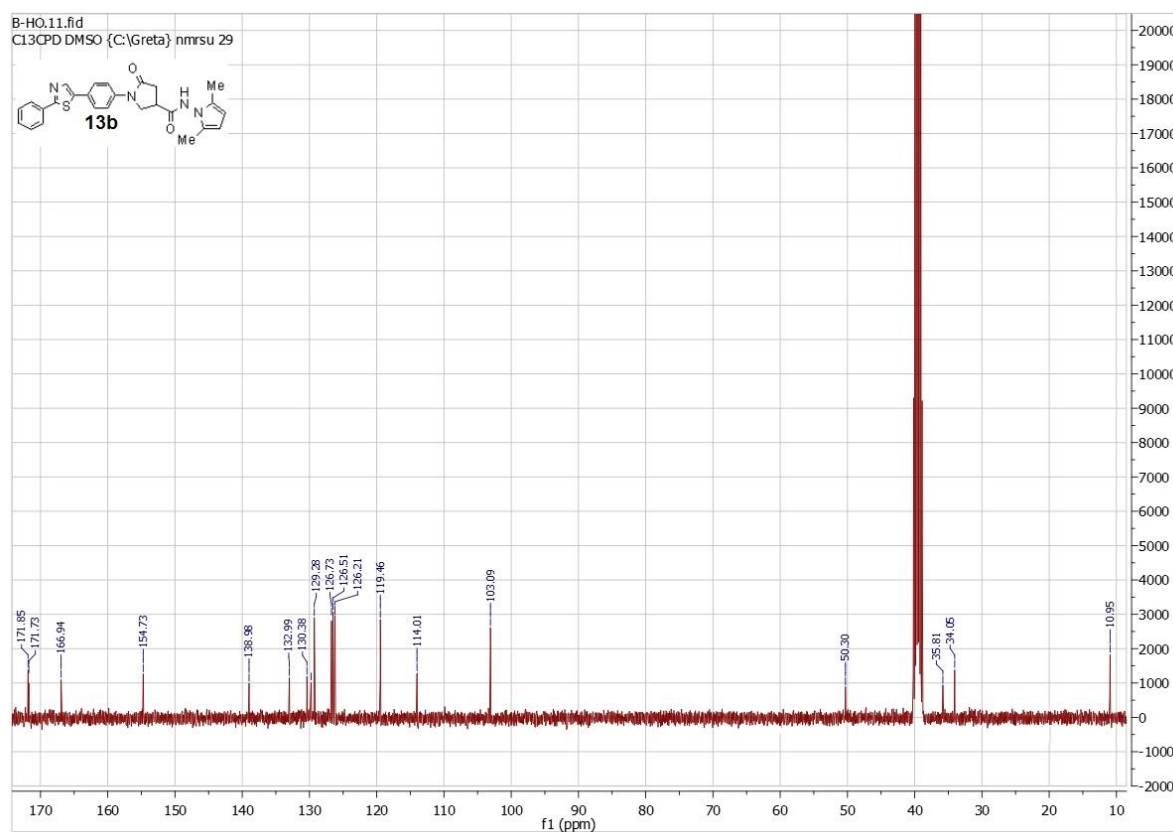
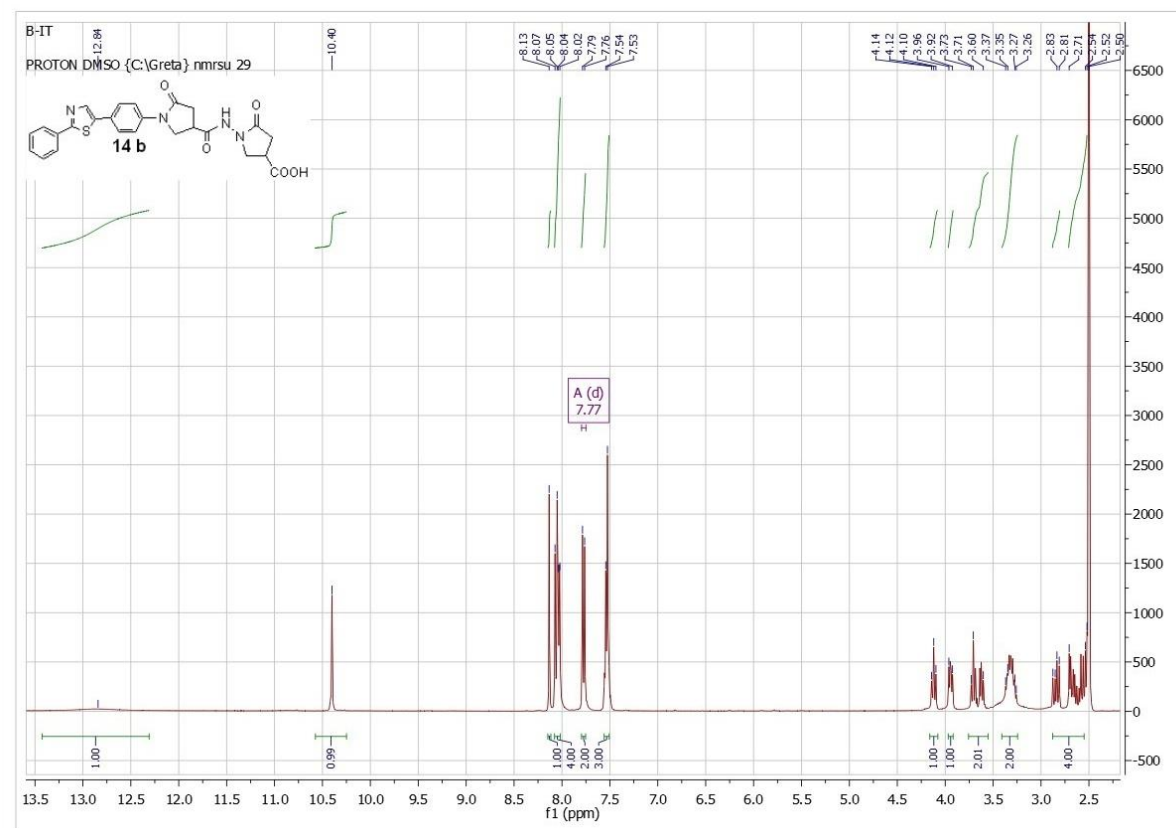
***N*-(2,5-Dimethyl-1*H*-pyrrol-1-yl)-5-oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carboxamide (13 b)**Figure S29: ¹H NMR of compound 13 b

Figure S30: ^{13}C NMR of compound **13 b****5-Oxo-1-(5-oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carboxamido)pyrrolidine-3-carboxylic acid (14 b)**Figure S31: ^1H NMR of compound **14 b**

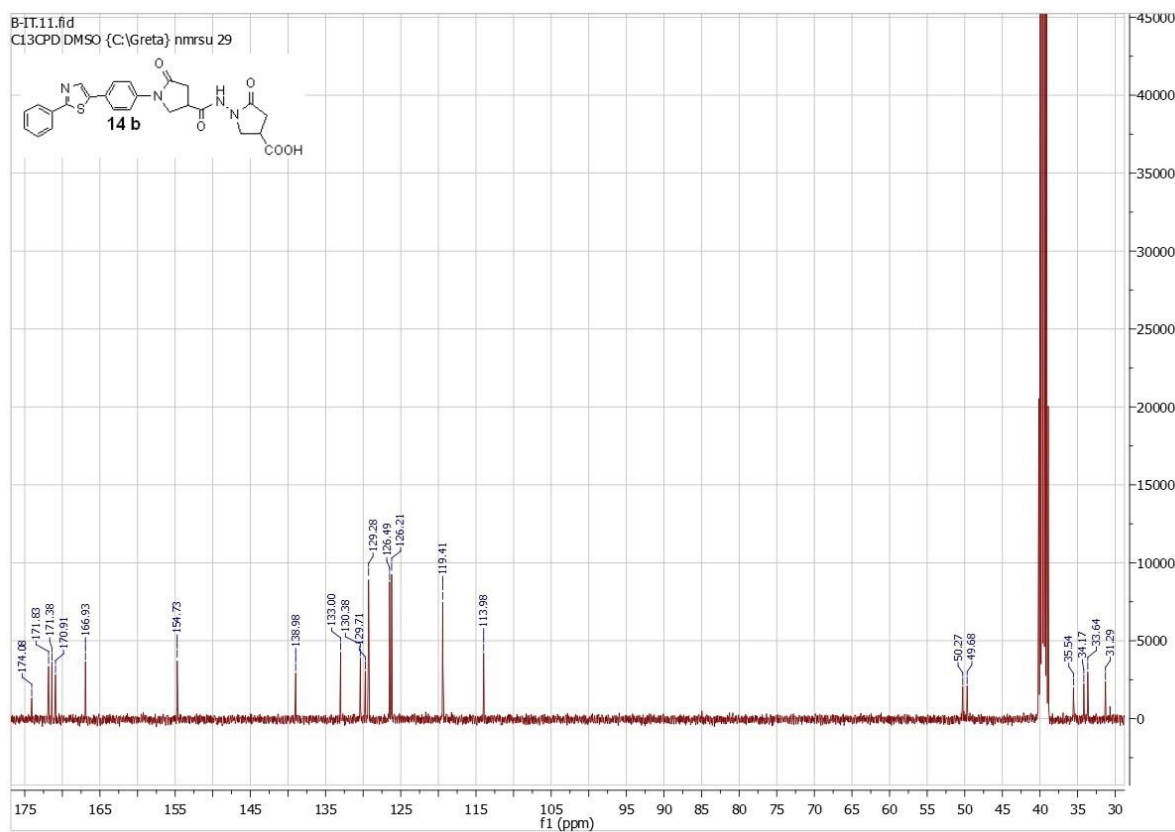
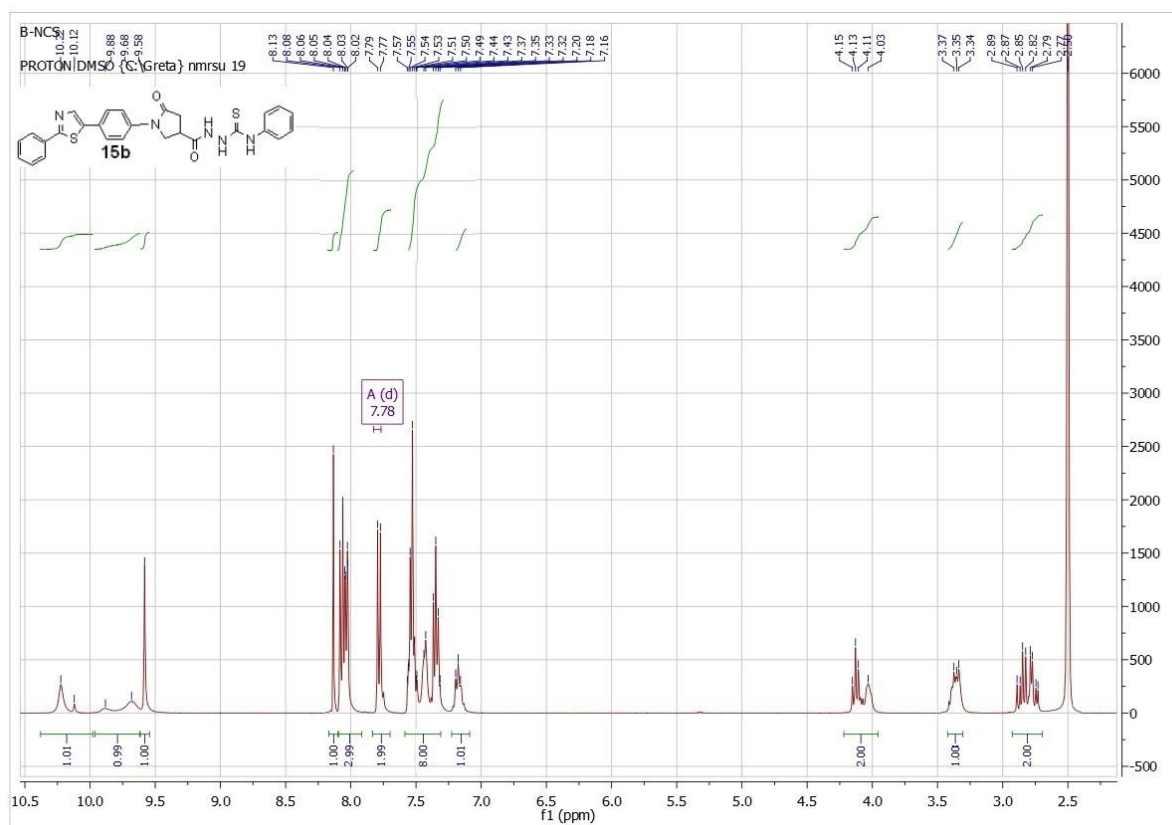
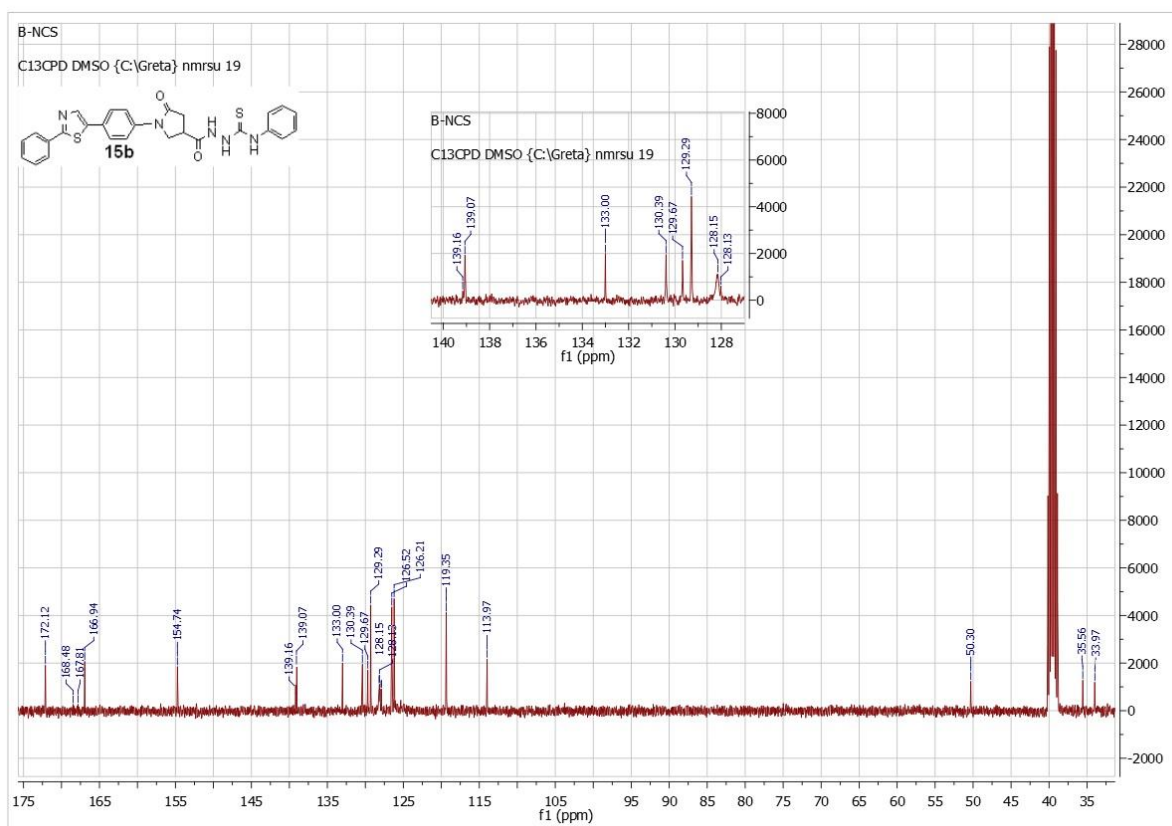
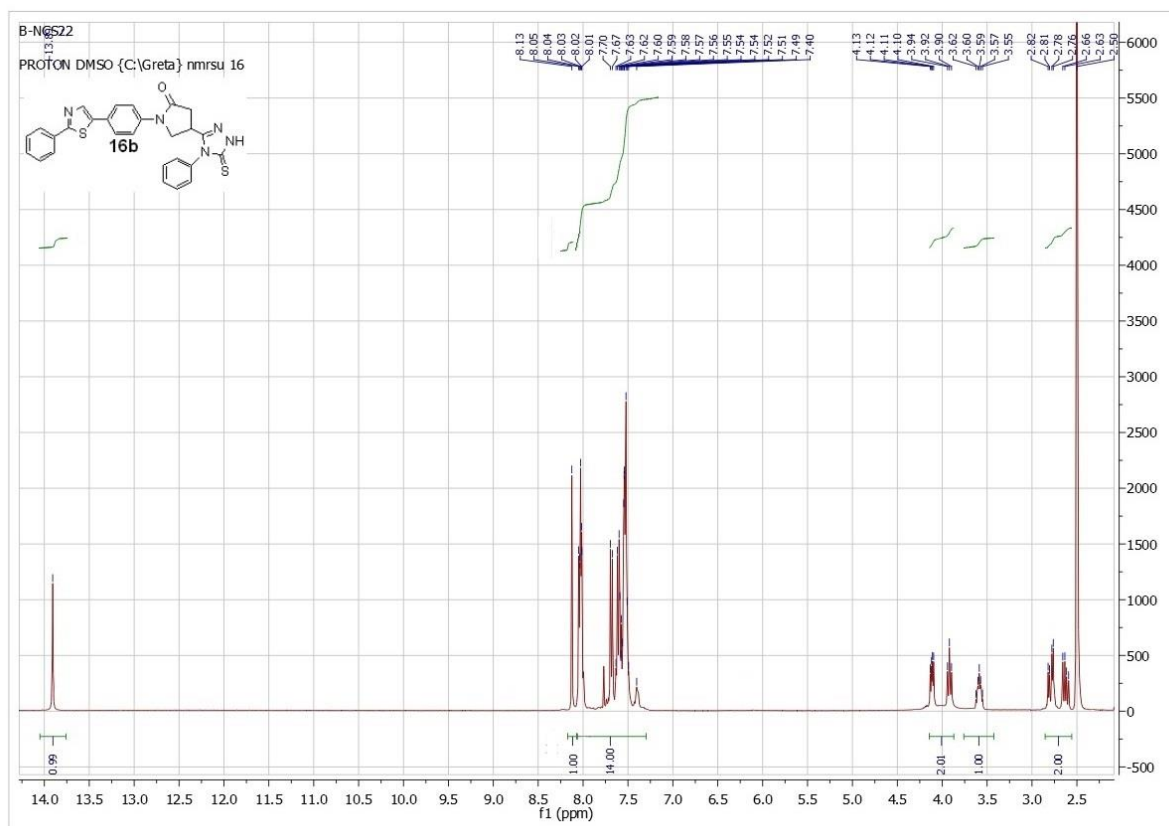
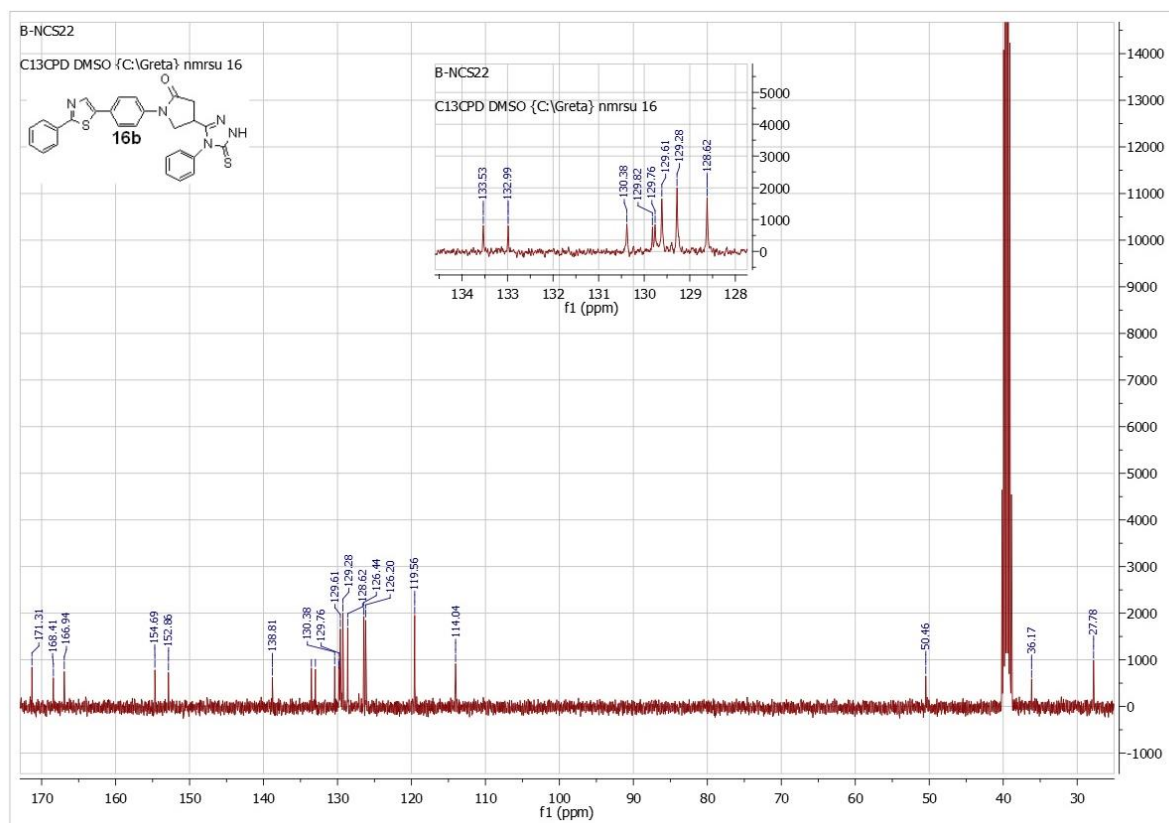


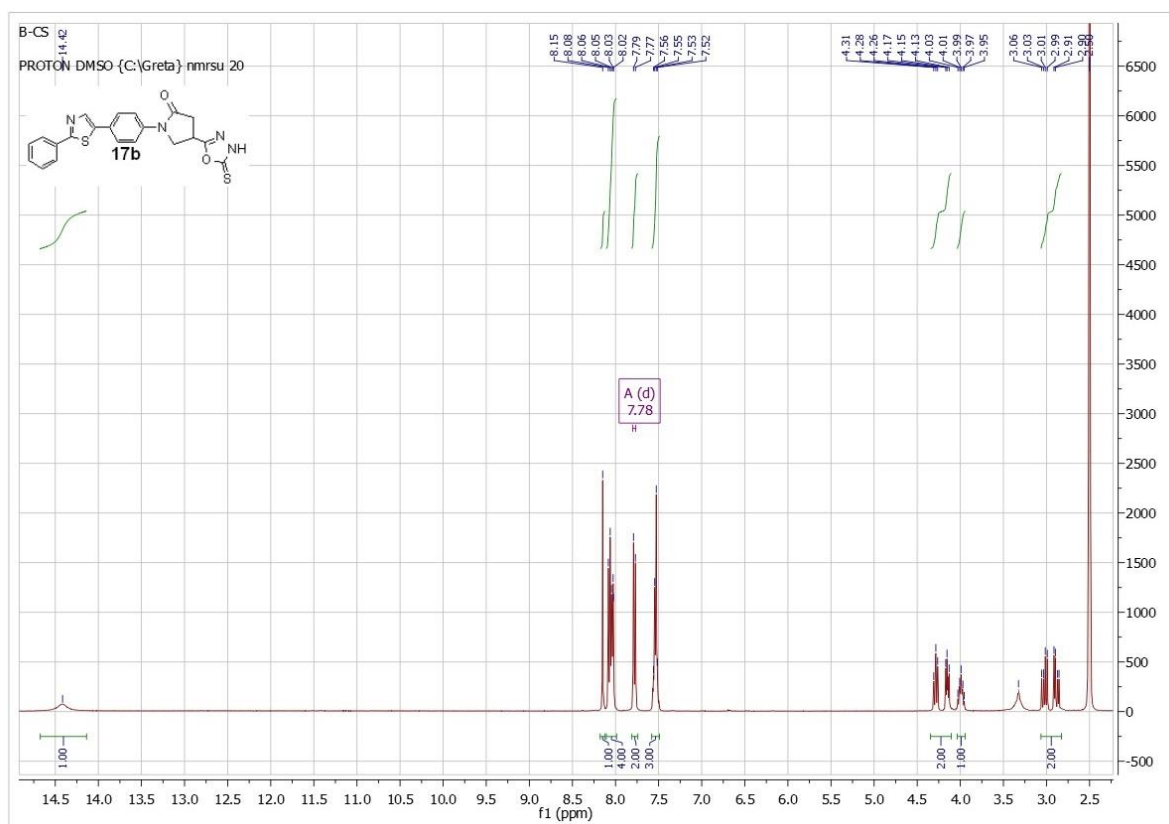
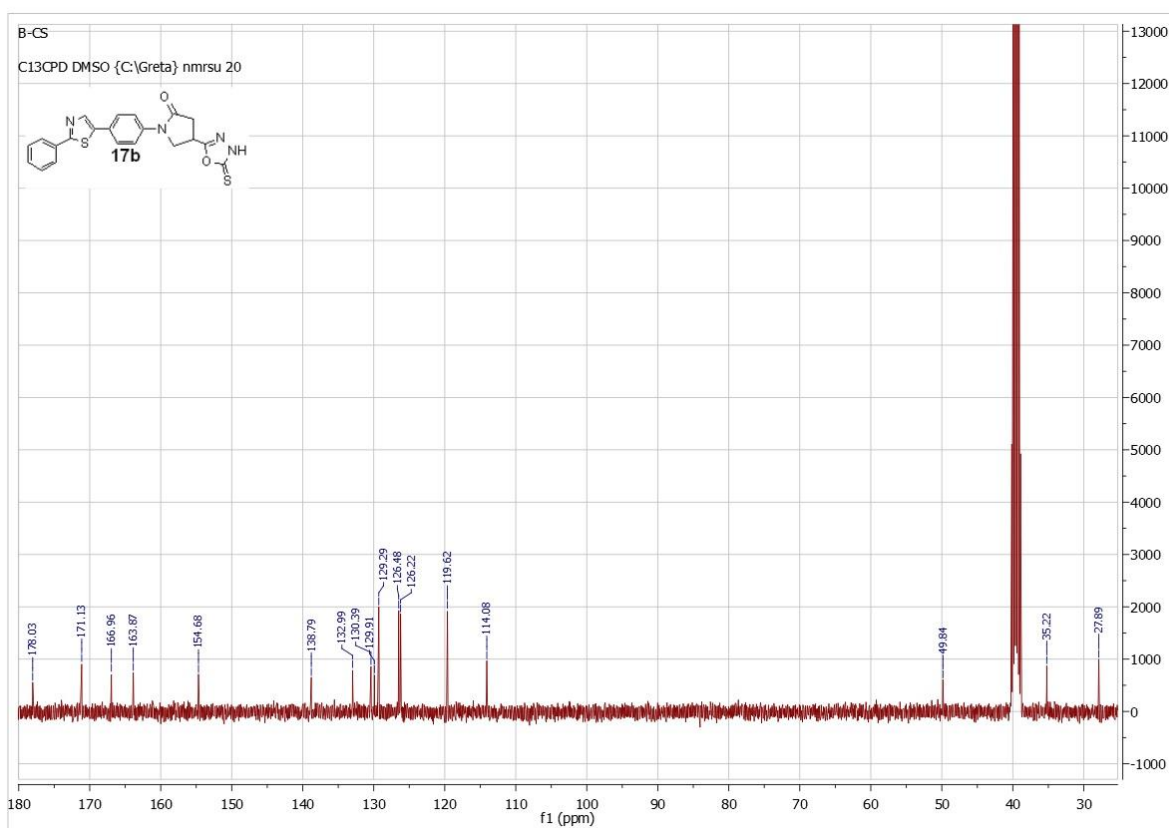
Figure S32: ^{13}C NMR of compound **14 b**

2-(5-Oxo-1-(4-(2-phenylthiazol-5-yl)phenyl)pyrrolidine-3-carbonyl)-*N*-phenylhydrazine-1-carbothioamide (15 b)

Figure S33: ¹H NMR of compound 15 bFigure S34: ¹³C NMR of compound 15 b

3-(4-Phenyl-5-thioxo-4,5-dihydro-1H-1,2,4-triazol-3-yl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (16 b)

Figure S35: ^1H NMR of compound **16 b**Figure S36: ^{13}C NMR of compound **16 b**

3-(5-Thioxo-4,5-dihydro-1,3,4-oxadiazol-2-yl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (17 b)Figure S37: ¹H NMR of compound **17 b**Figure S38: ¹³C NMR of compound **17 b**

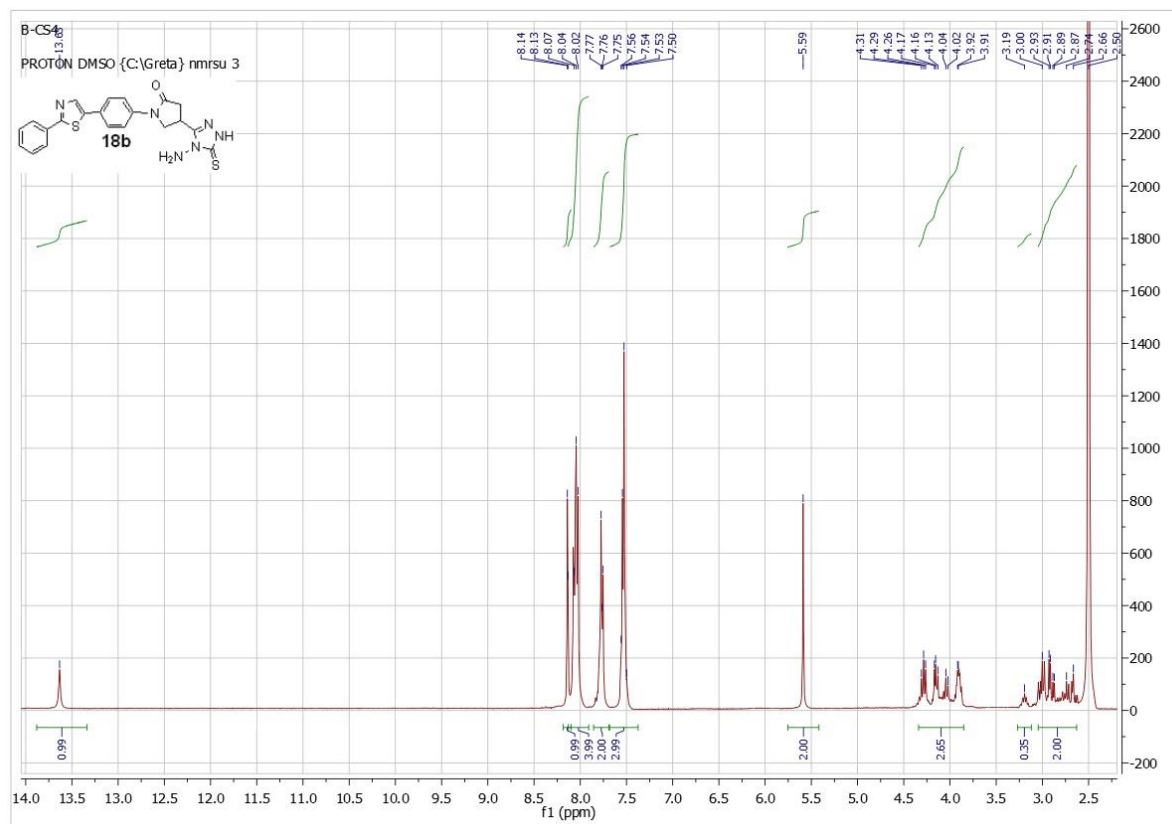
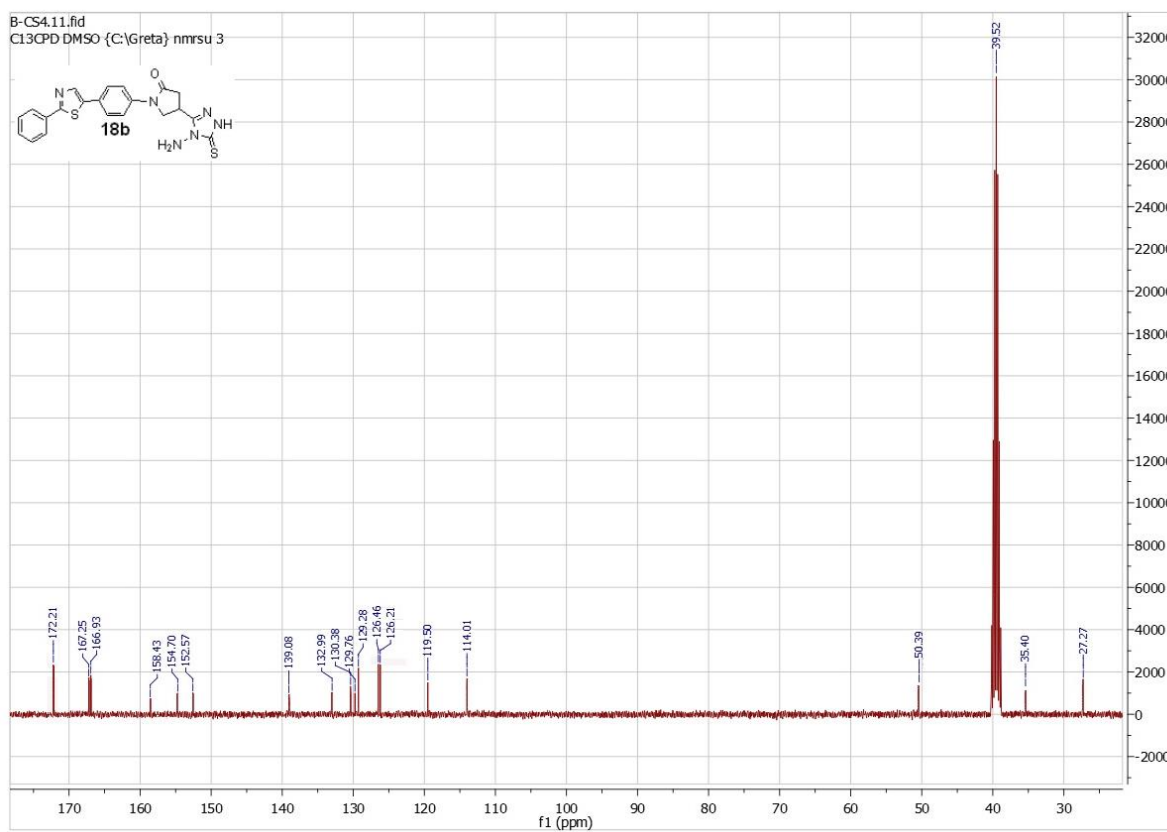
3-(4-Amino-5-thioxo-4,5-dihydro-1H-1,2,4-triazol-3-yl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (18 b)Figure S39: ¹H NMR of compound **18 b**

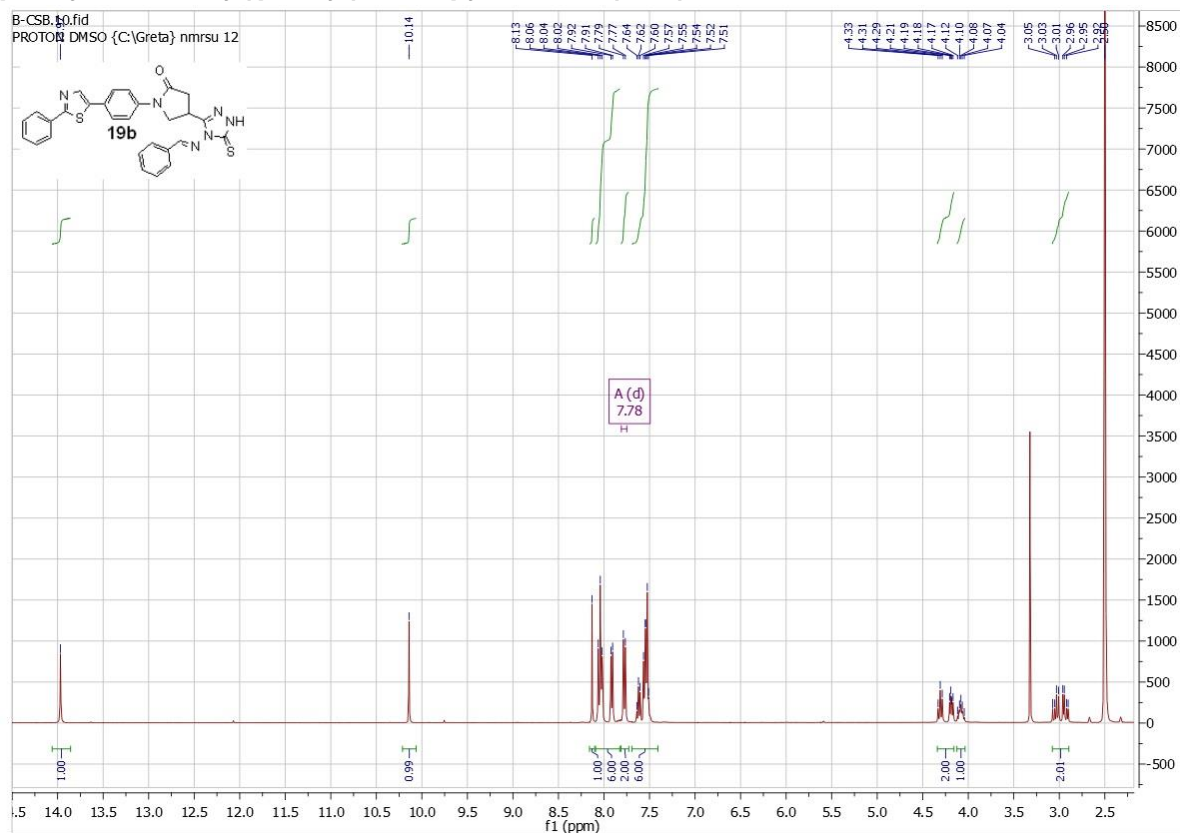
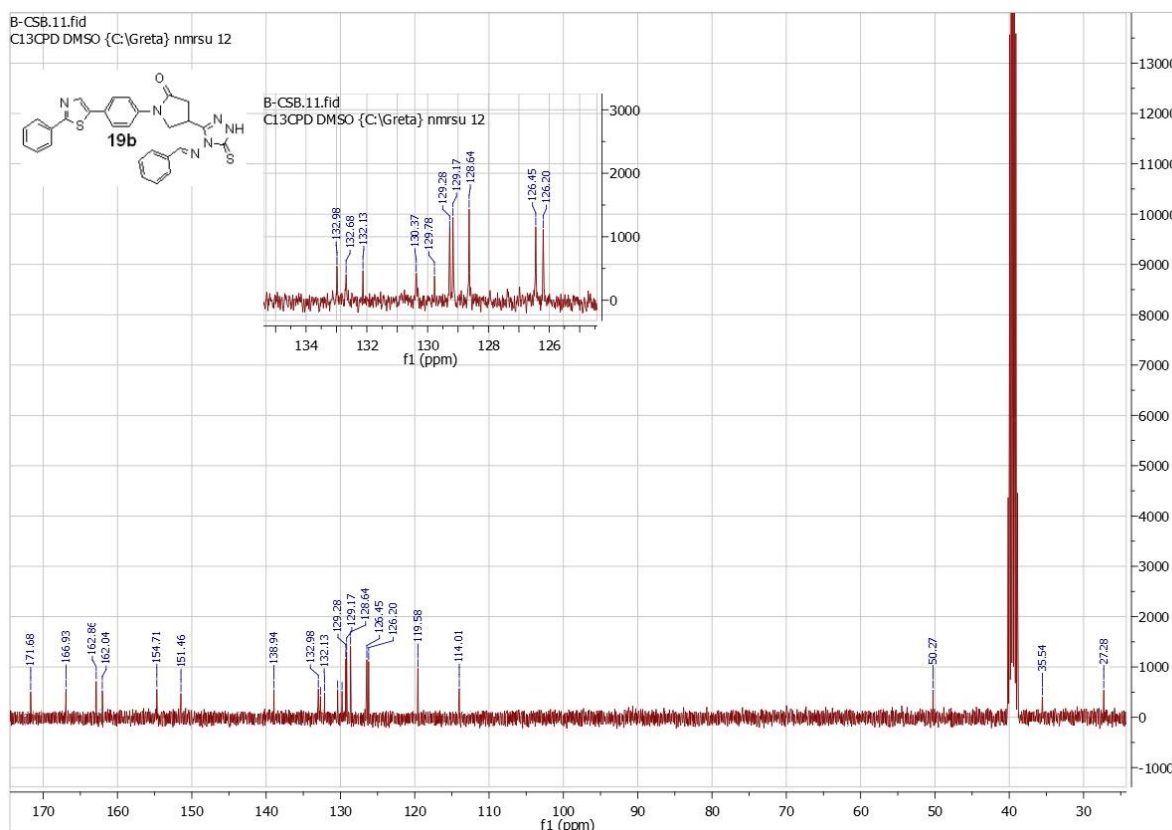
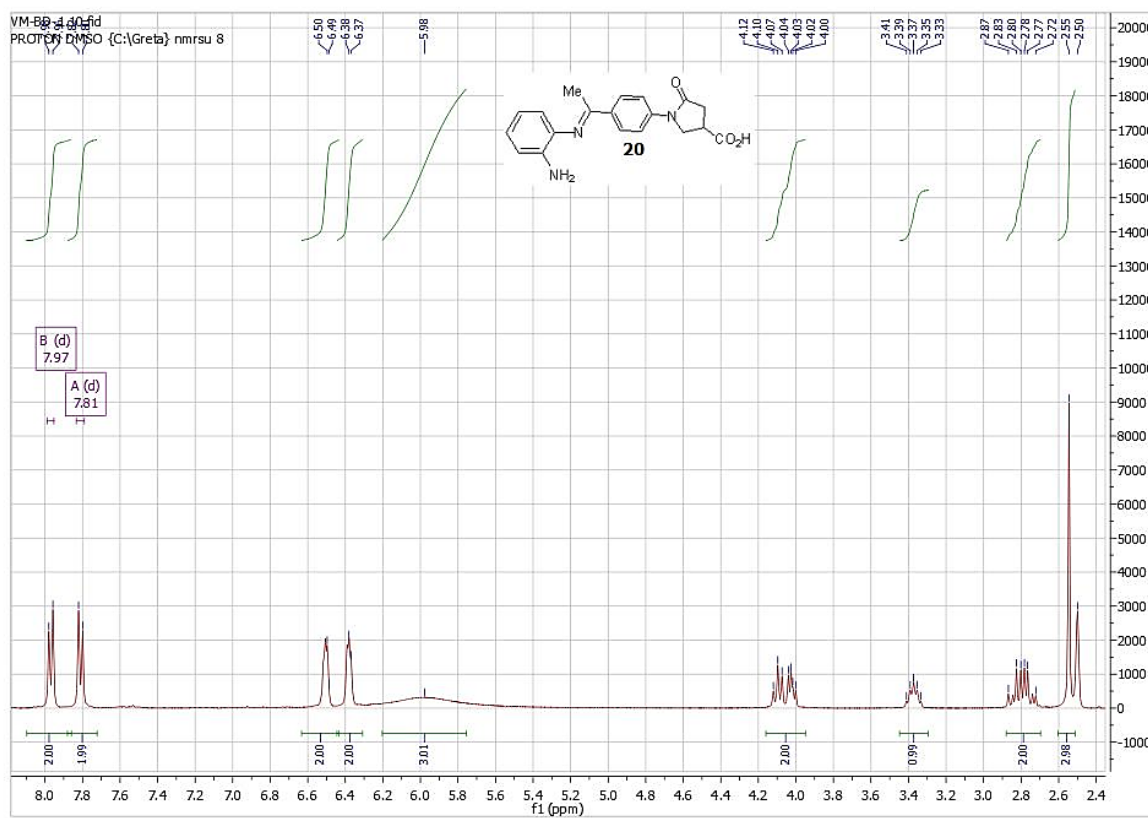
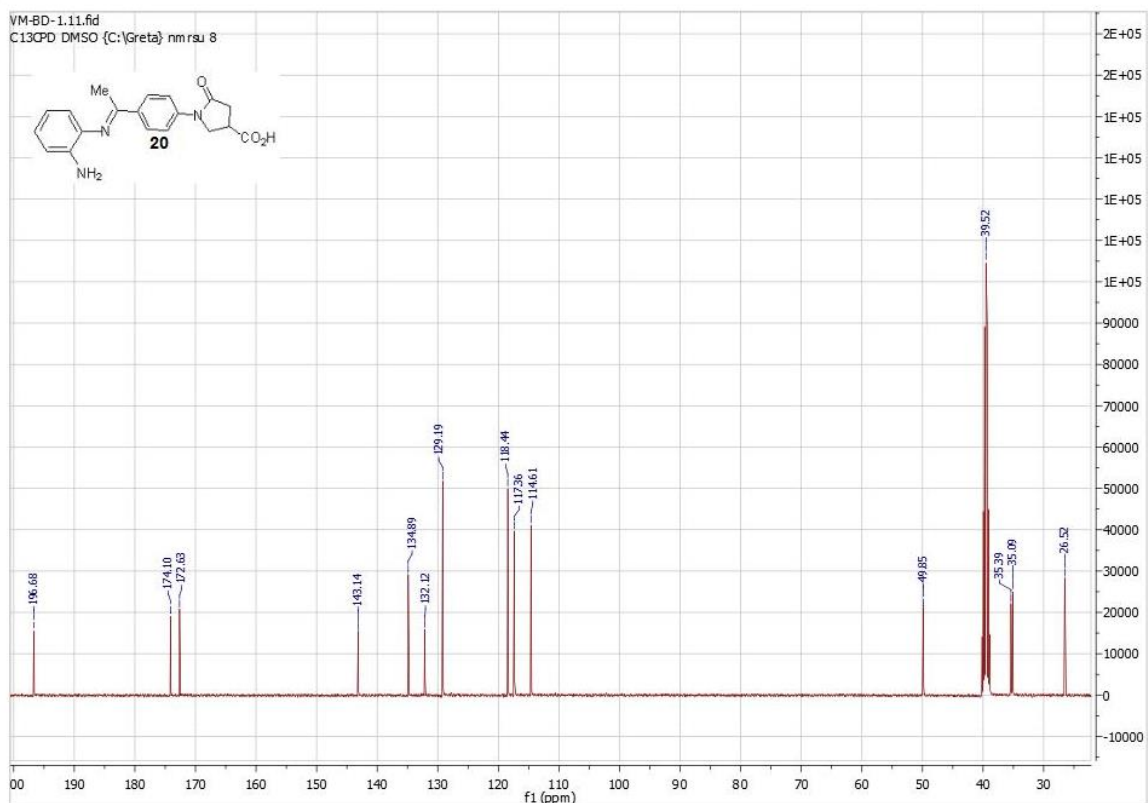
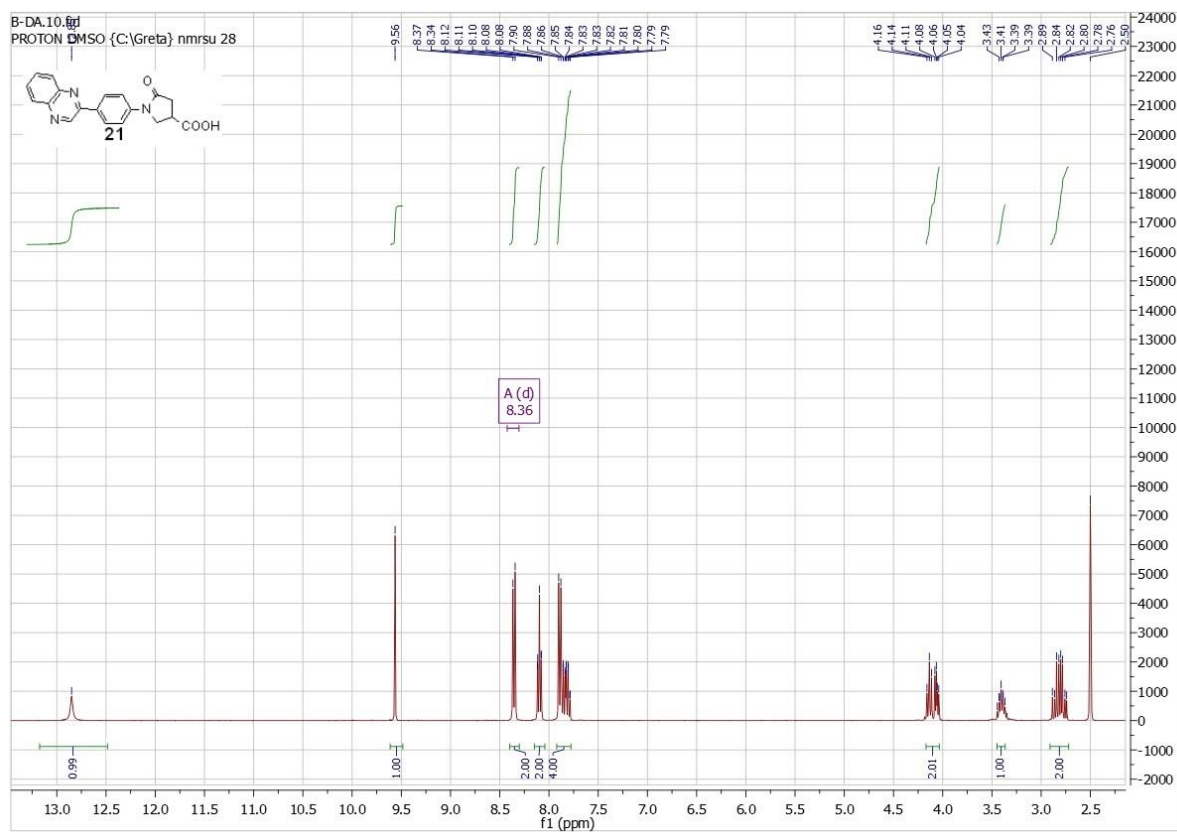
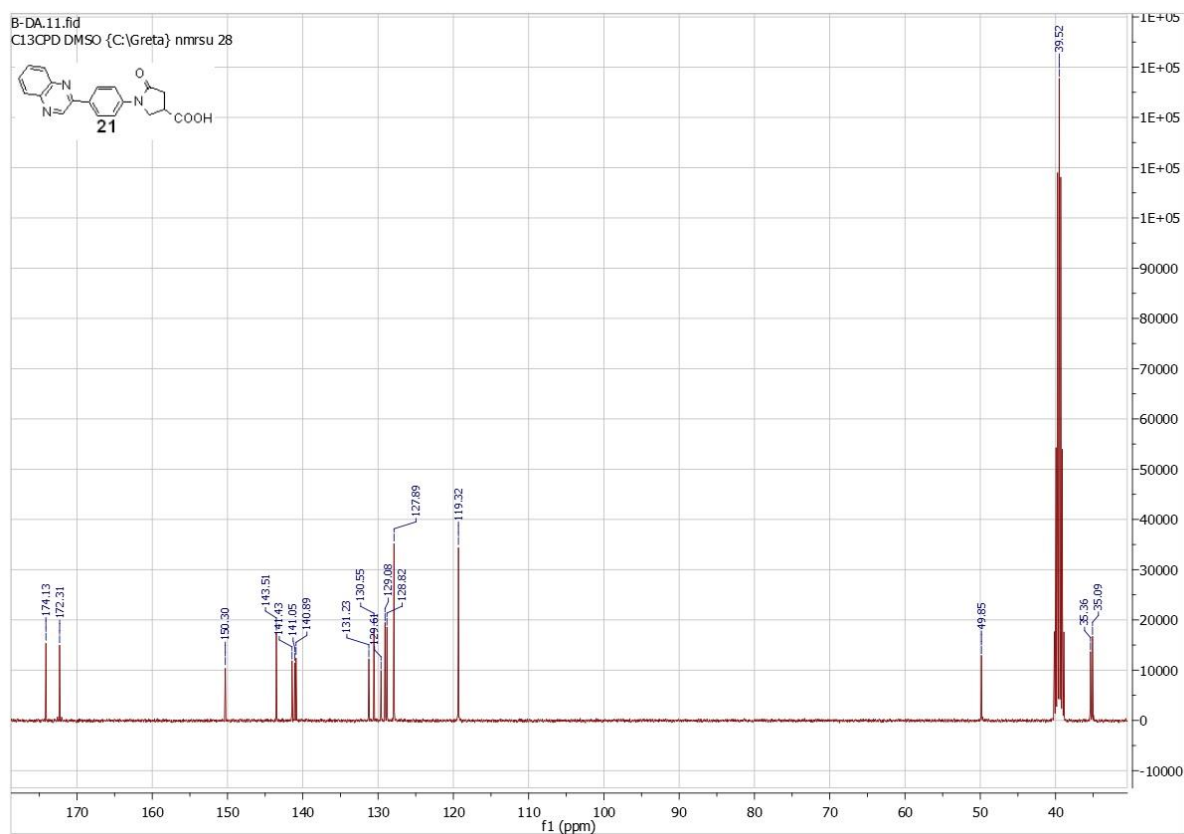
Figure S40: ^{13}C NMR of compound **18 b****3-(4-(Benzylideneamino)-5-thioxo-4,5-dihydro-1H-1,2,4-triazol-3-yl)-1-(4-(2-phenylthiazol-5-yl)phenyl)-5-oxopyrrolidine (19 b)**Figure S41: ^1H NMR of compound **19 b**

Figure S42: ^{13}C NMR of compound **19 b****1-(4-(1-((2-Aminophenyl)iminoethyl)phenyl)-5-oxopyrrolidine-3-carboxylic acid (20)**Figure S43: ^1H NMR of compound **20**

Figure S44: ^{13}C NMR of compound 20

5-Oxo-1-(4-(quinoxalin-2-yl)phenyl)pyrrolidine-3-carboxylic acid (21)

Figure S45: ^1H NMR of compound 21

Figure S46: ^{13}C NMR of compound 21

1-(4-Acetylphenyl)-3-(1H-benzimidazol-2-yl)-5-oxopyrrolidine (22)

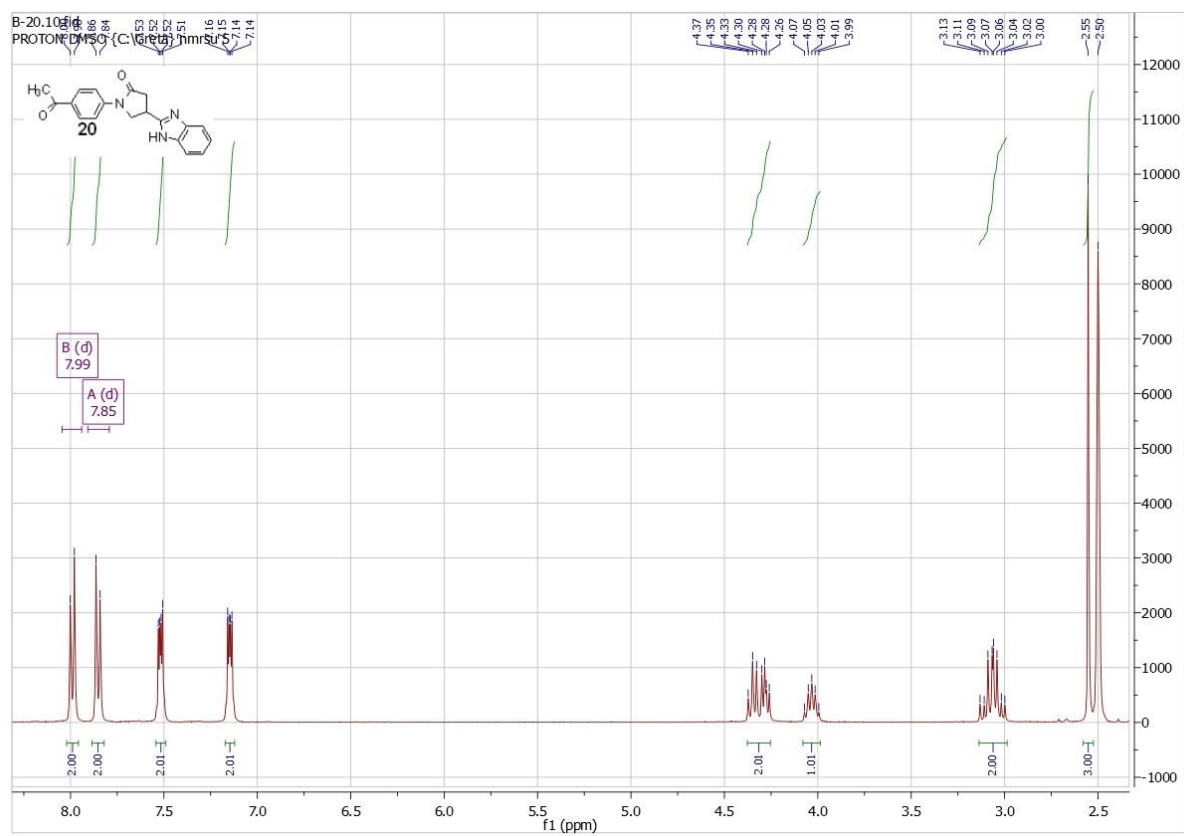
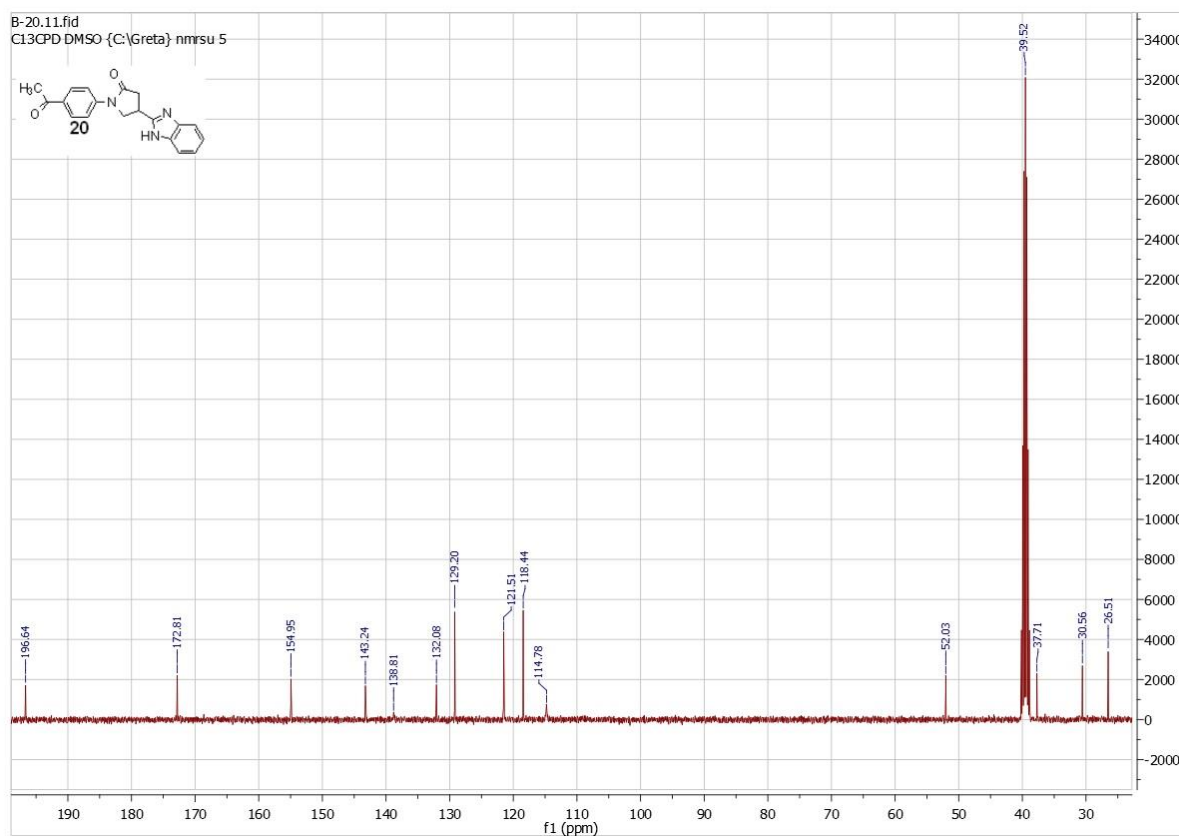
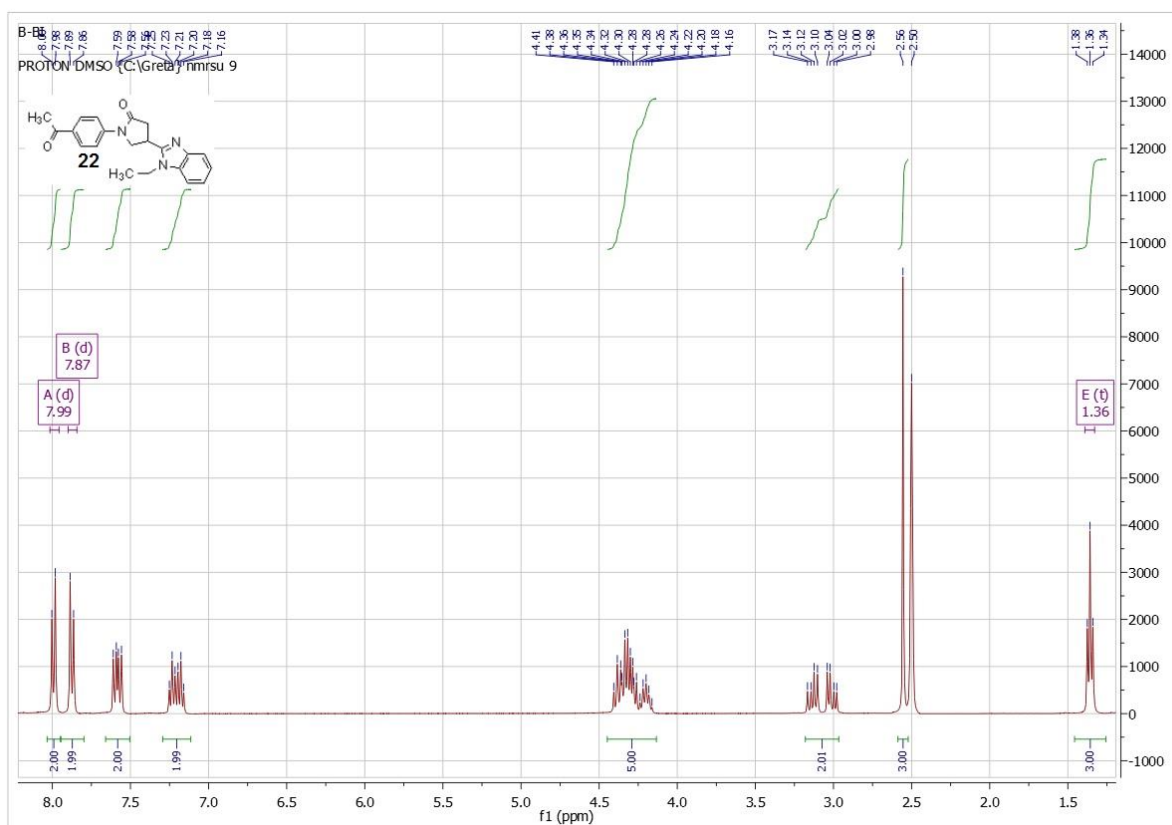
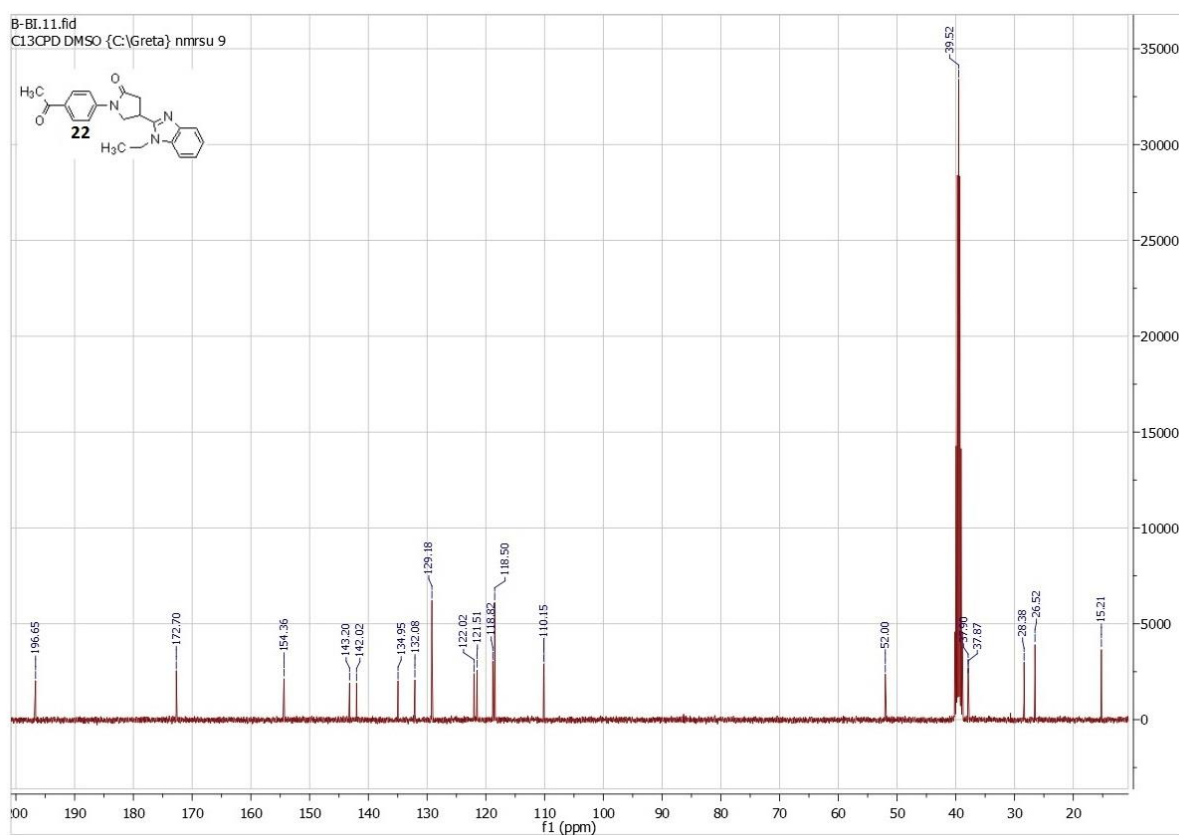


Figure S47: ^1H NMR of compound **22**Figure S48: ^{13}C NMR of compound **22****1-(4-Acetylphenyl)-3-(1-ethyl-1*H*-benzimidazol-2-yl)-5-oxopyrrolidine (23)**

Figure S49: ¹H NMR of compound **23**Figure S50: ¹³C NMR of compound **23**