Supplementary Material

Scalable synthesis of 3-*O* functionalized deoxyribonolactones from biorenewable levoglucosenone

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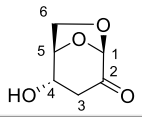
(1R,2S,5R)-2-hydroxy-6,8-dioxabicyclo[3.2.1]octan-4-one (2a)



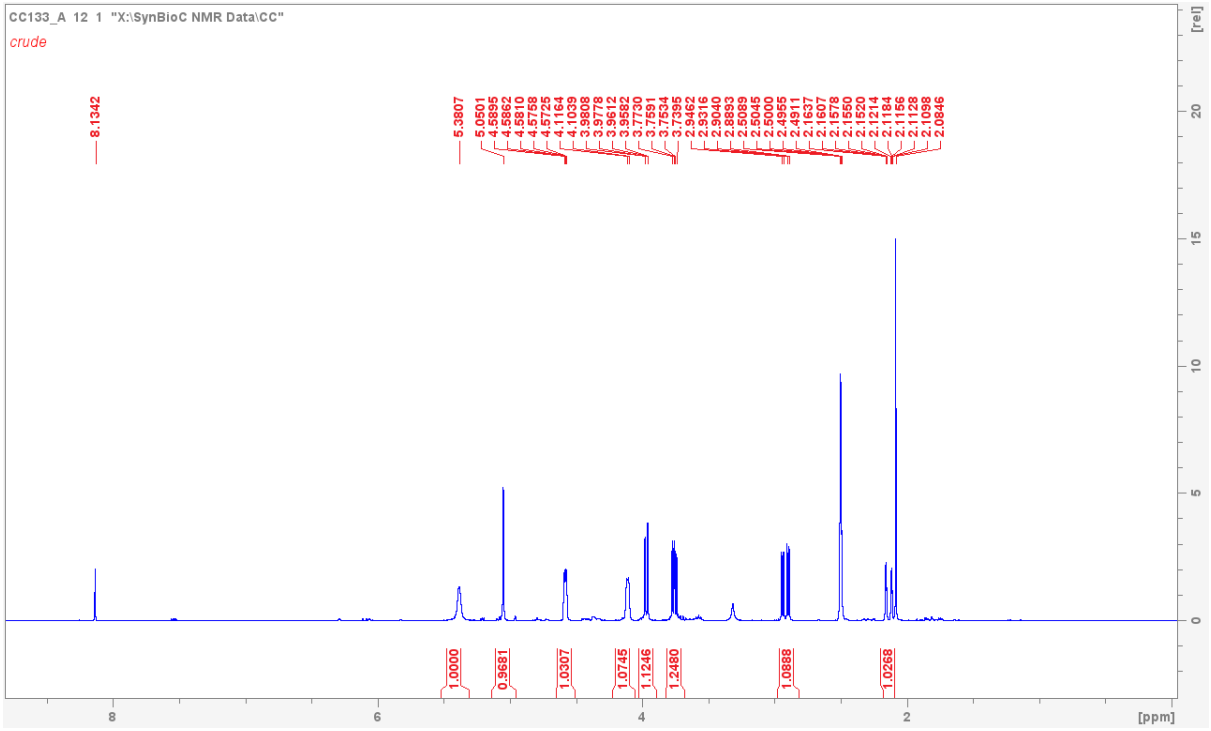


Figure S1. ^{1}H NMR spectrum of **2a**

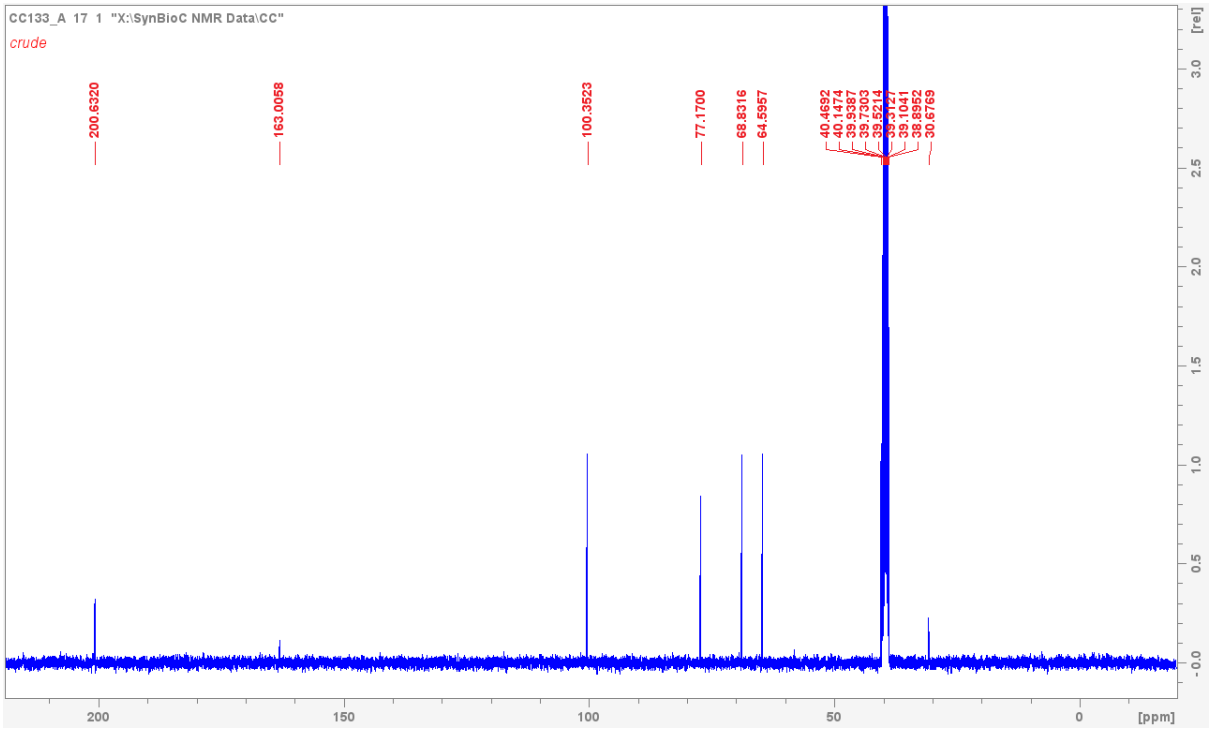
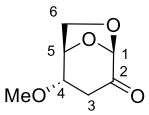


Figure S2. ^{13}C NMR spectrum of **2a**

(1*R*,2*S*,5*R*)-2-methoxy-6,8-dioxabicyclo[3.2.1]octan-4-one (2b)



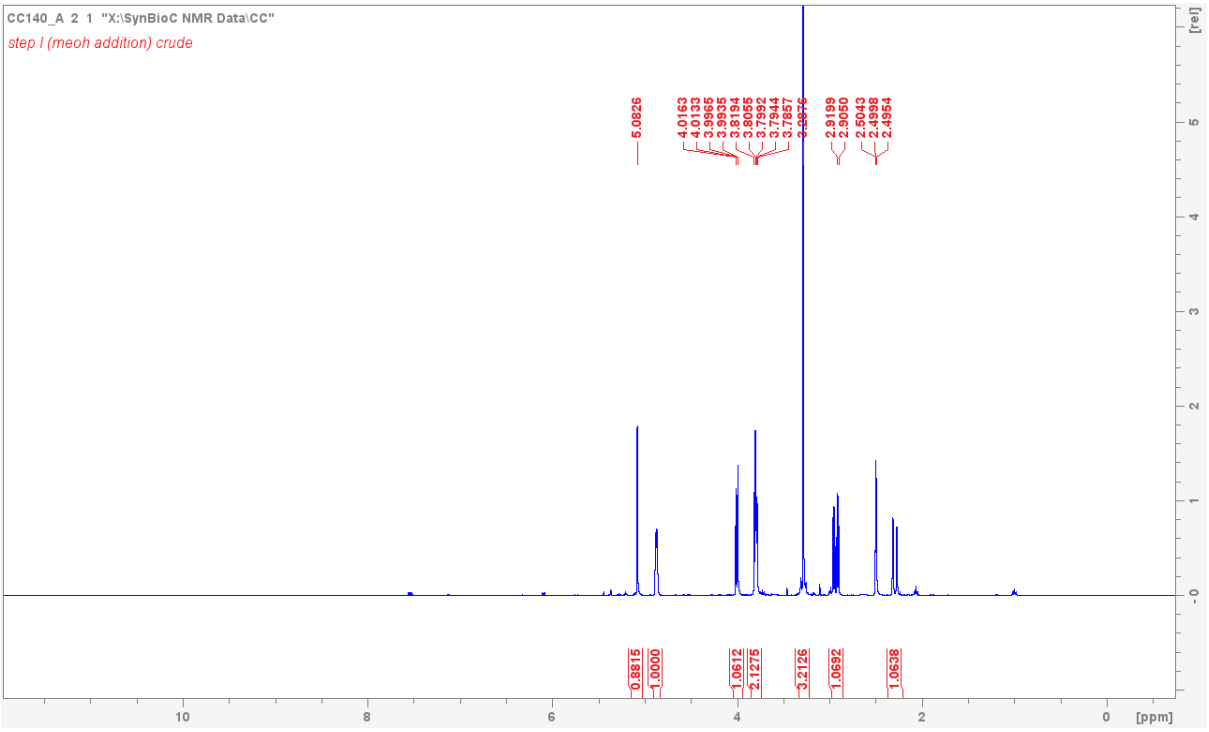


Figure S3. ^{1}H NMR spectrum of **2b**

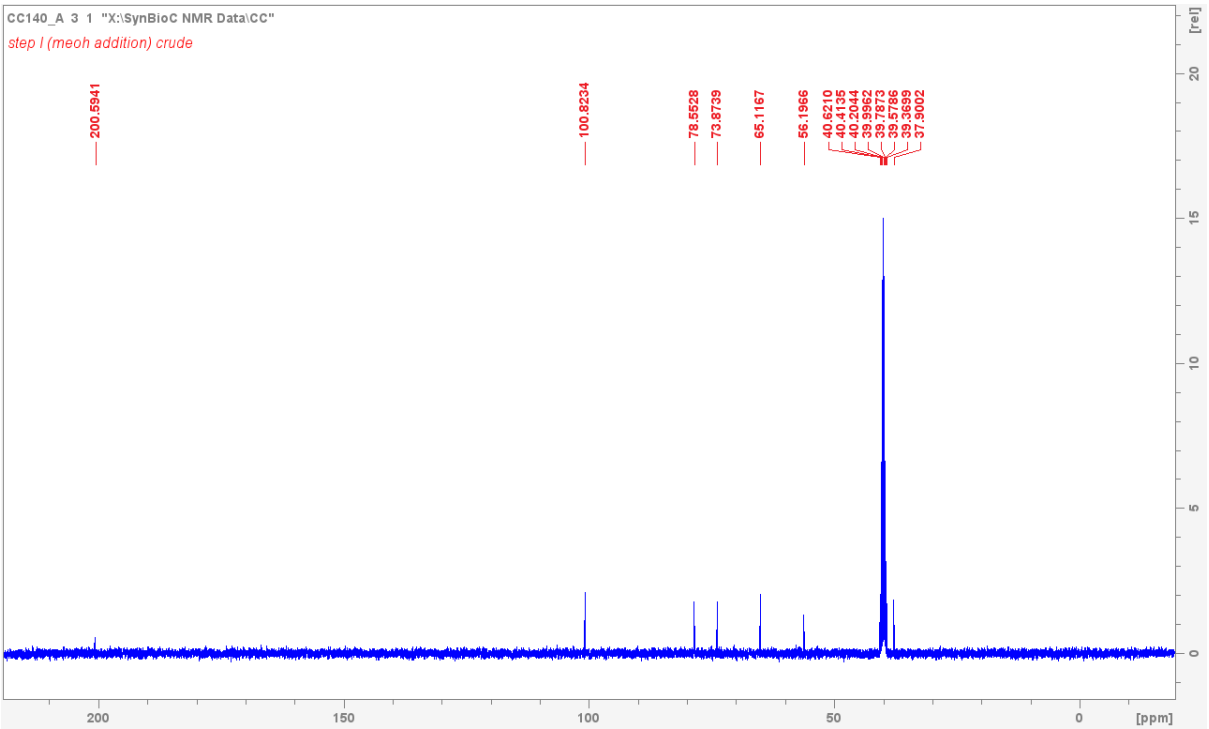
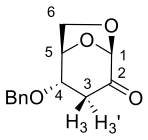


Figure S4. ^{13}**C NMR spectrum of 2b**

(1*R*,2*S*,5*R*)-2-(benzyloxy)-6,8-dioxabicyclo[3.2.1]octan-4-one (2c)



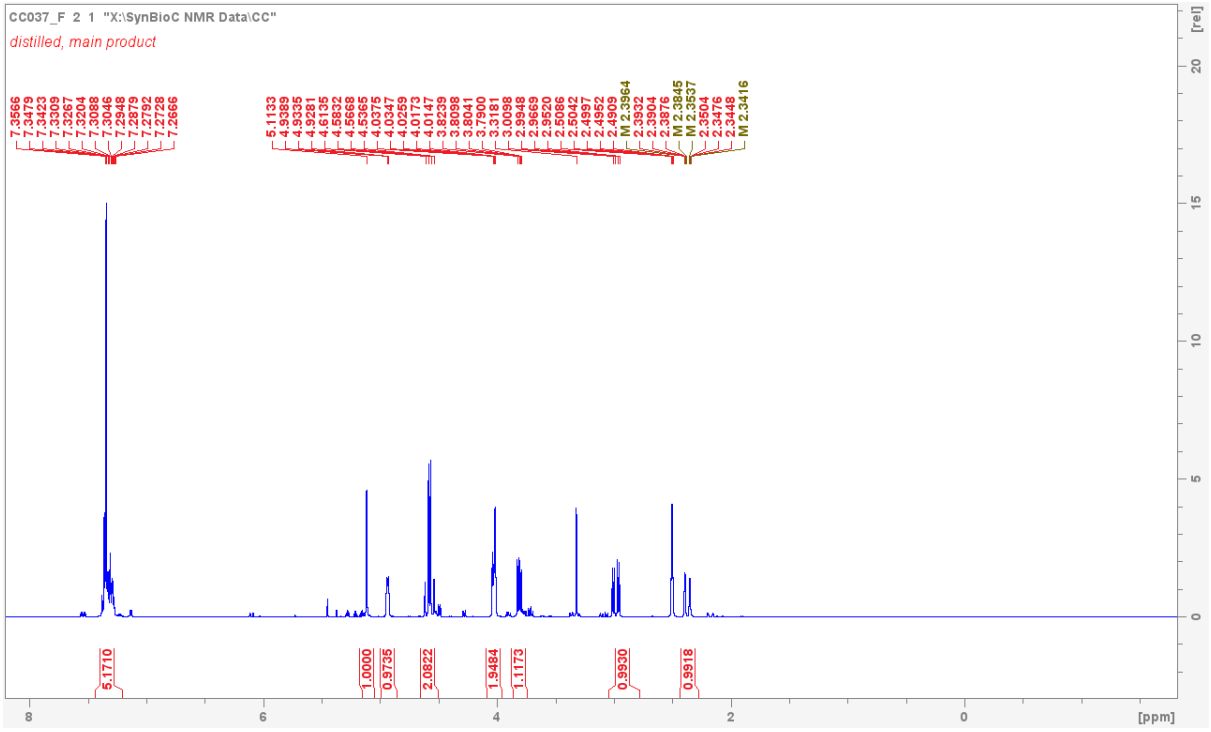


Figure S5. ^{1}H NMR spectrum of **2c**

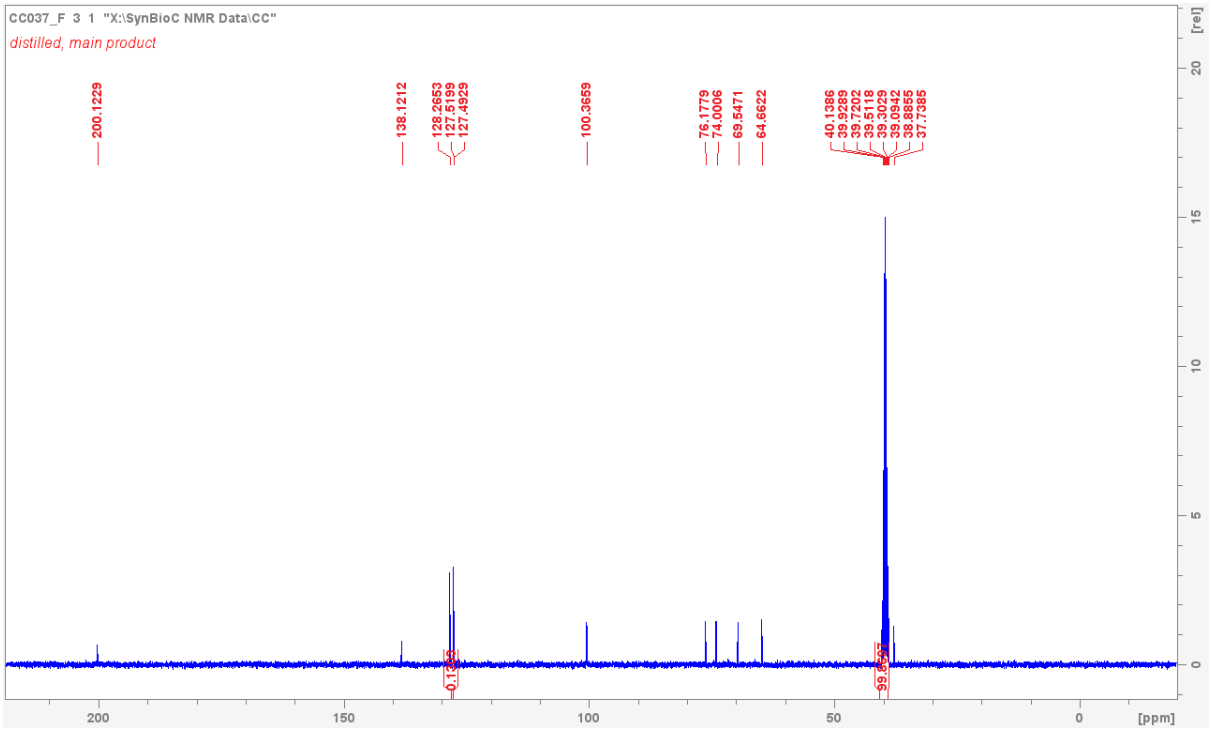
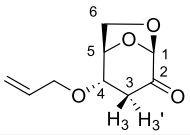


Figure S6. ^{13}C NMR spectrum of **2c**

(1*R*,2*S*,5*R*)-2-(allyloxy)-6,8-dioxabicyclo[3.2.1]octan-4-one (2d)



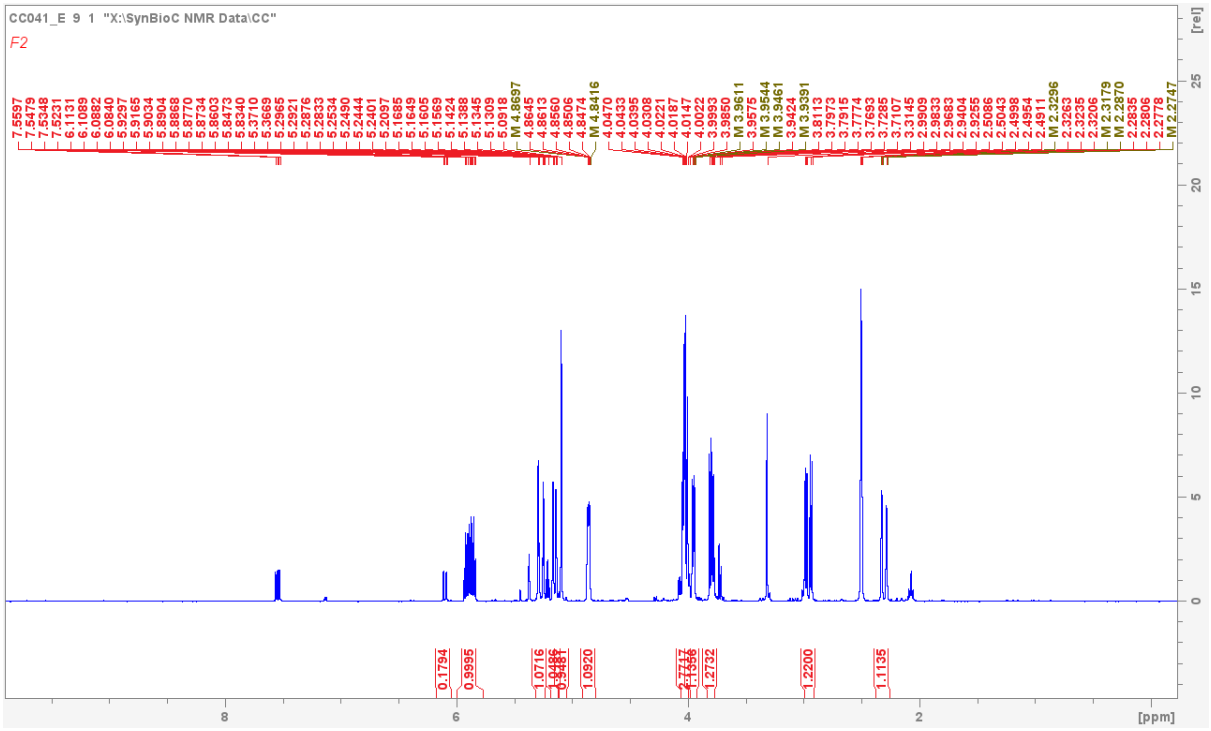


Figure S7. ^{1}H NMR spectrum of **2d**

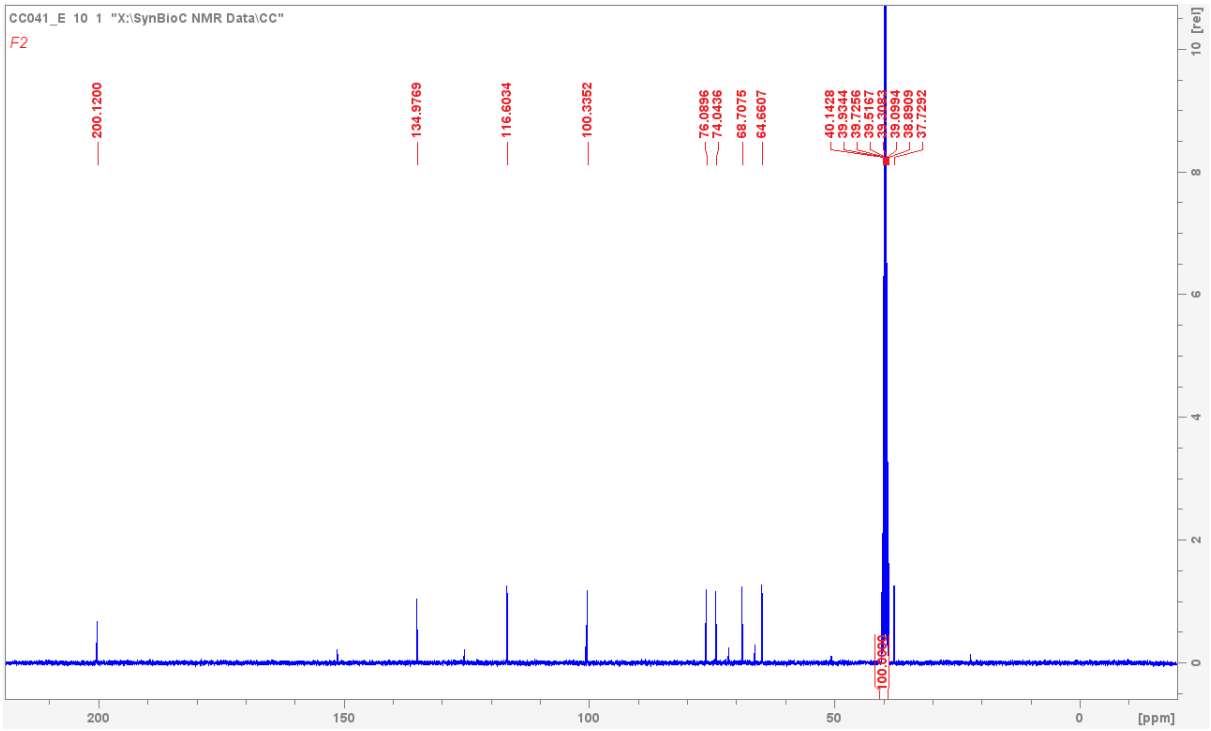
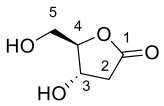


Figure S8. ^{13}C NMR spectrum of **2d**

(4S,5R)-4-hydroxy-5-(hydroxymethyl)dihydrofuran-2(3H)-one (3a)



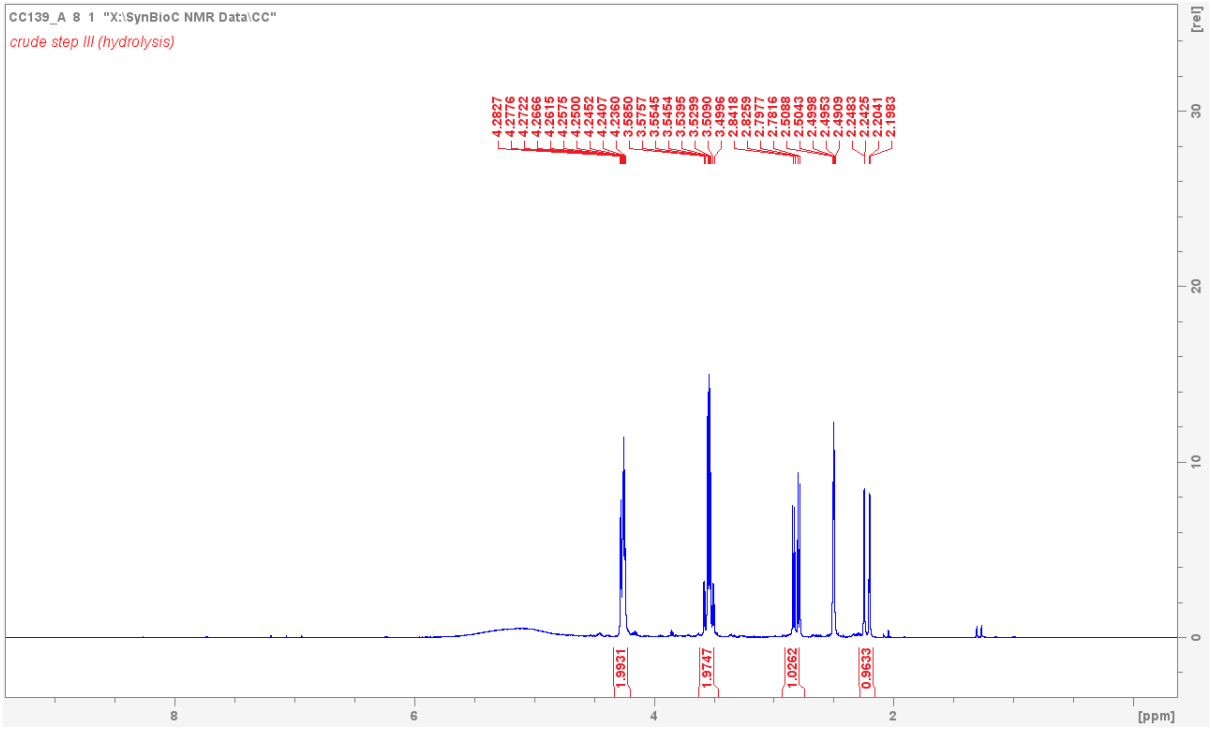


Figure S9. ^{1}H NMR spectrum of **3a**

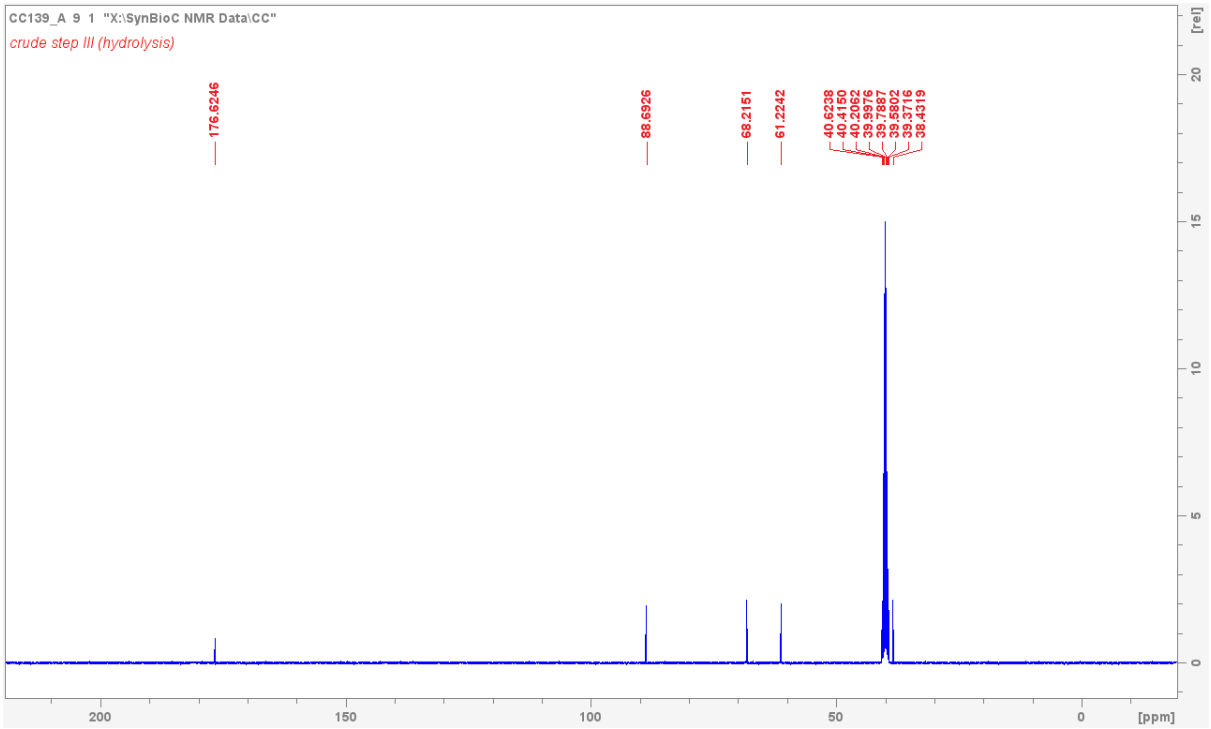
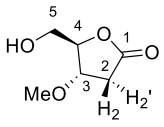


Figure S10. ^{13}C NMR spectrum of **3a**

(4*S*,5*R*)-5-(hydroxymethyl)-4-methoxydihydrofuran-2(3*H*)-one (3b)



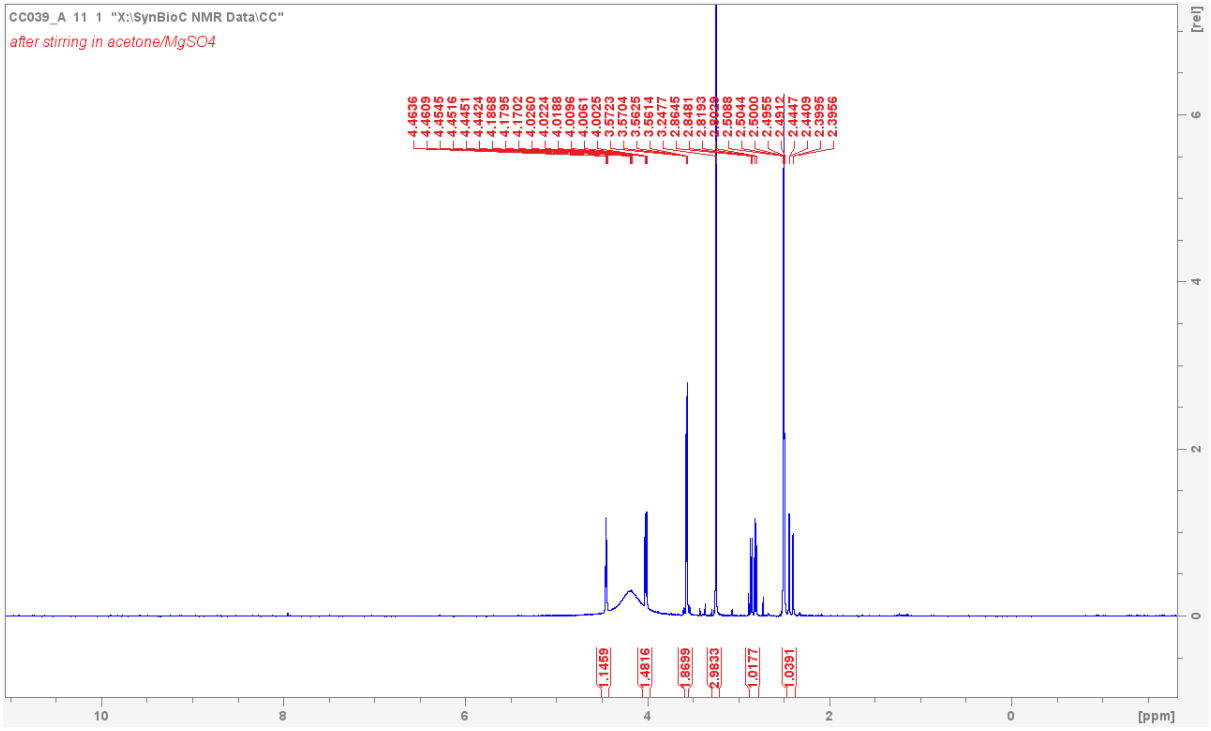


Figure S11. ^{1}H NMR spectrum of **3b**

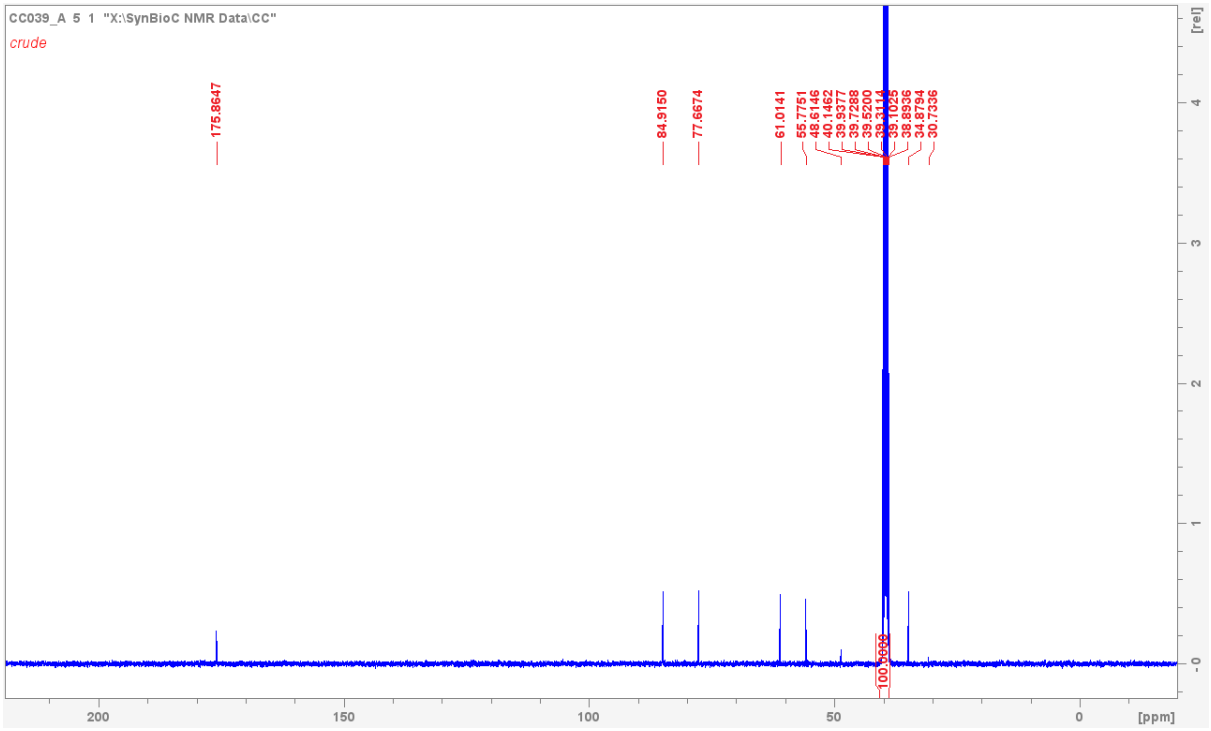
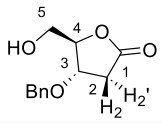


Figure S12. ^{13}C NMR spectrum of **3b**

(4*S*,5*R*)-4-(benzyloxy)-5-(hydroxymethyl)dihydrofuran-2(3*H*)-one (3c)



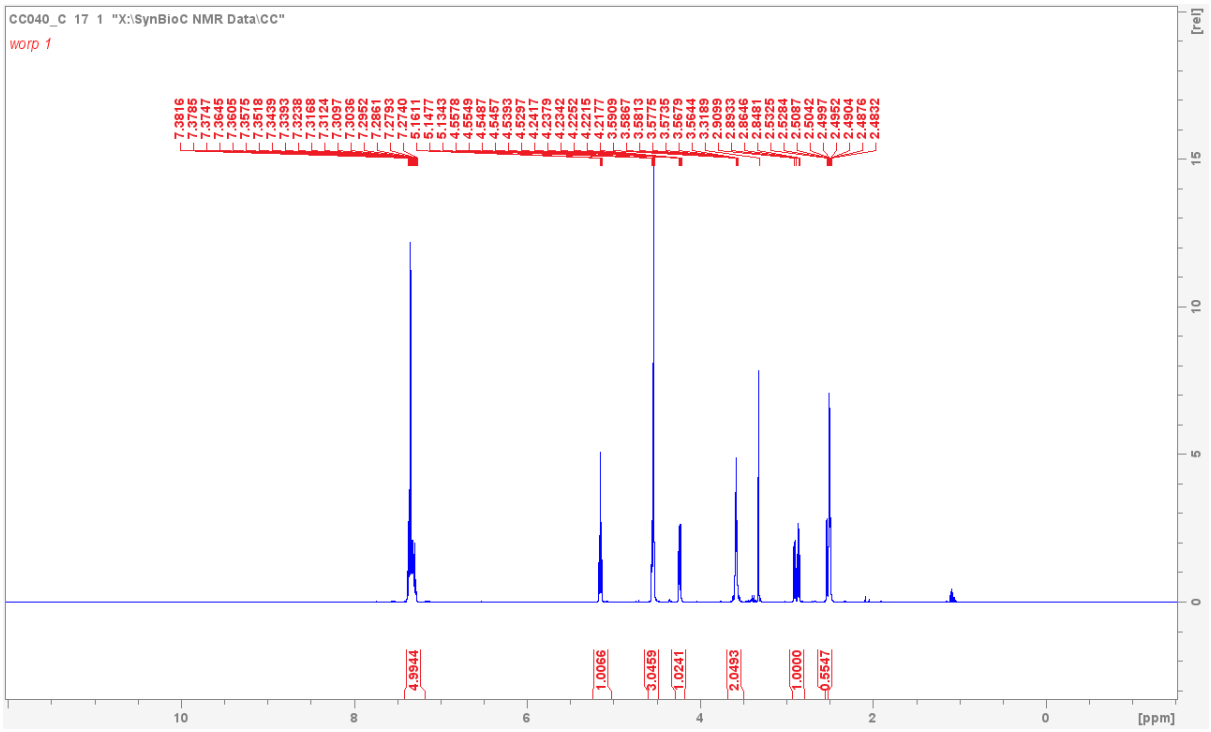


Figure S13. ^{1}H NMR spectrum of **3c**

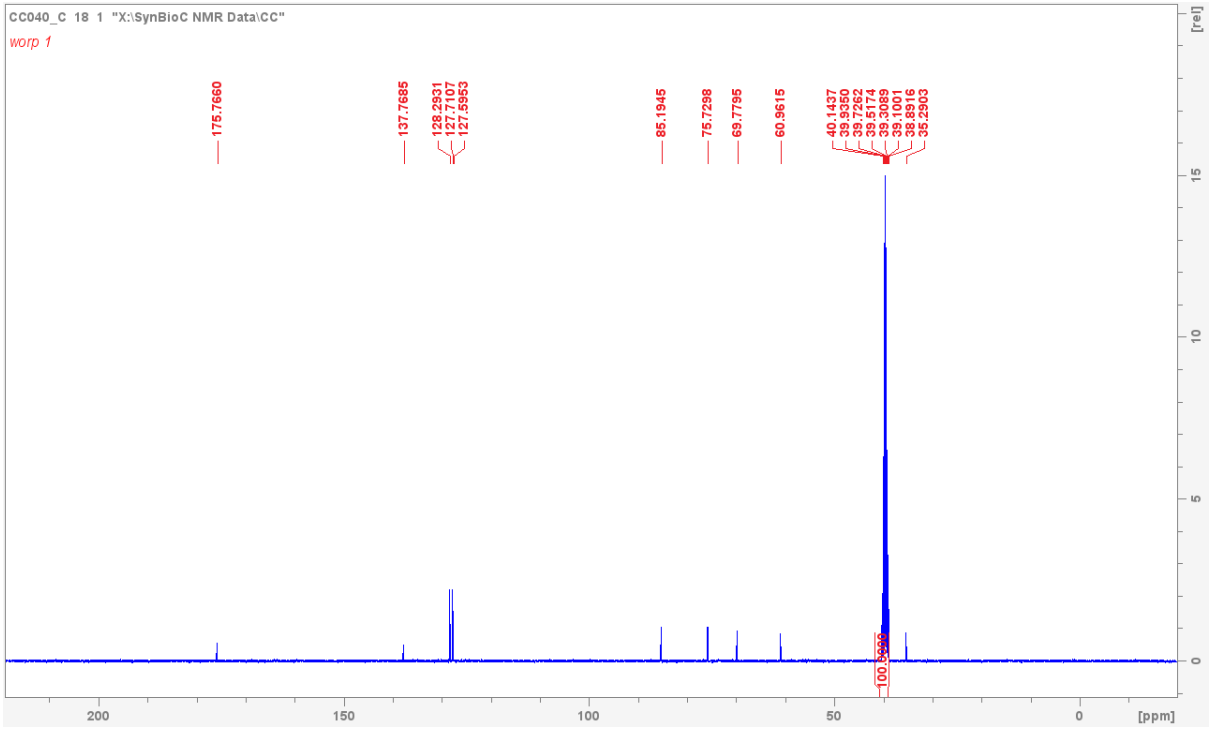
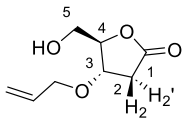


Figure S14. ^{13}C NMR spectrum of **3c**

(4*S*,5*R*)-4-(allyloxy)-5-(hydroxymethyl)dihydrofuran-2(3*H*)-one (3d)



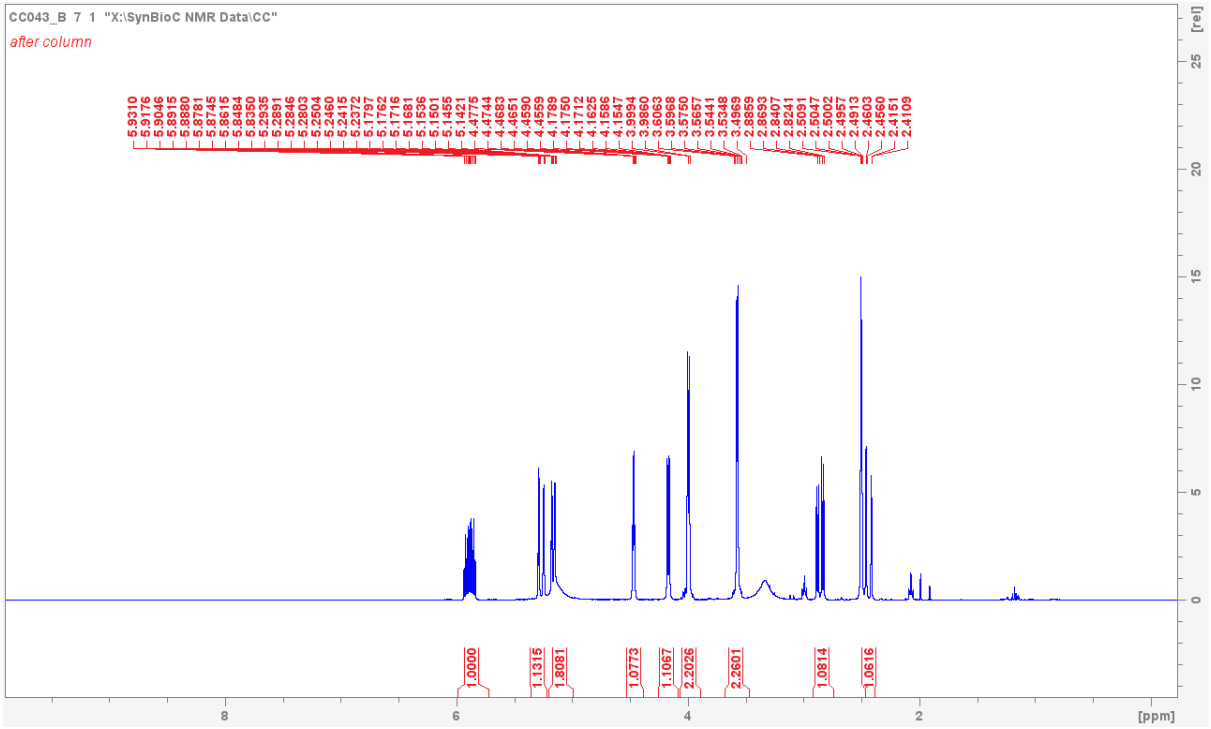


Figure S15. ^{1}H NMR spectrum of **3d**

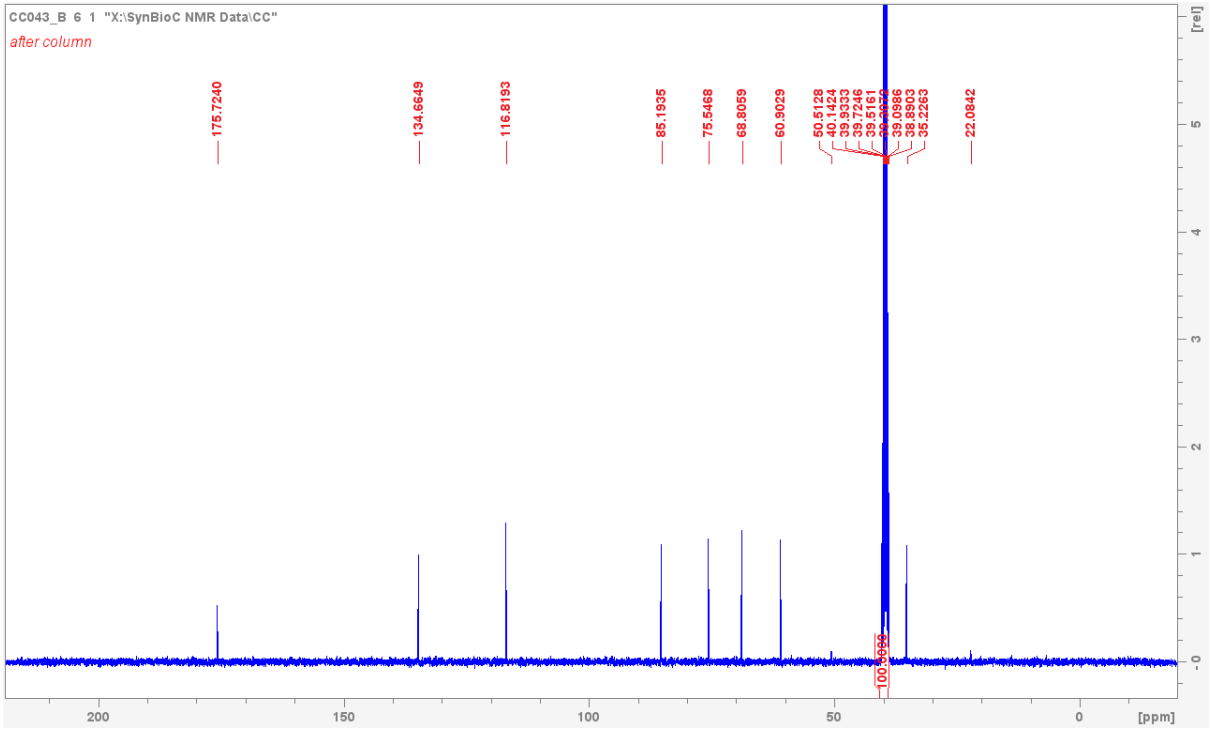
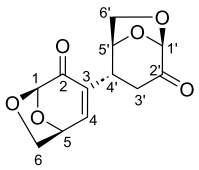


Figure S16. ^{13}C NMR spectrum of **3d**

(1*S*,1'*S*,2*R*,5*R*,5'*R*)-6,6',8,8'-tetraoxa[2,3'-bi(bicyclo[3.2.1]octan)]-2'-ene-4,4'-dione 5



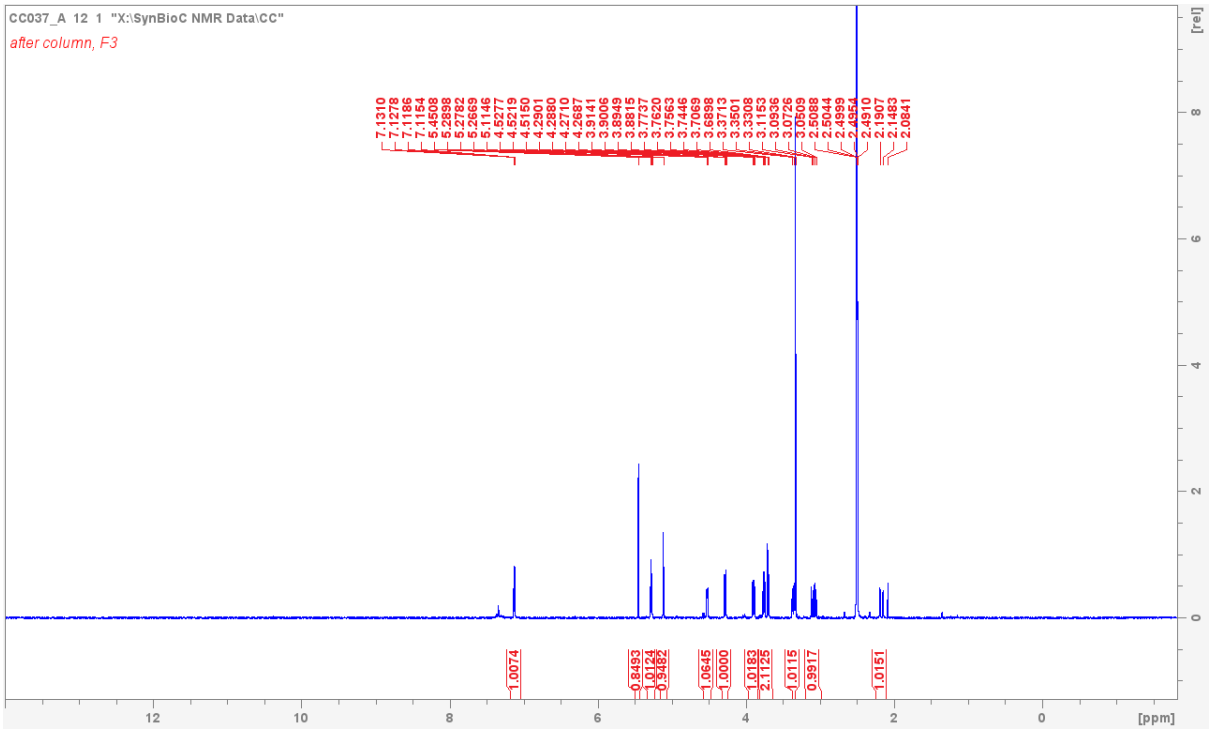


Figure S17. ^{1}H NMR spectrum of **5**

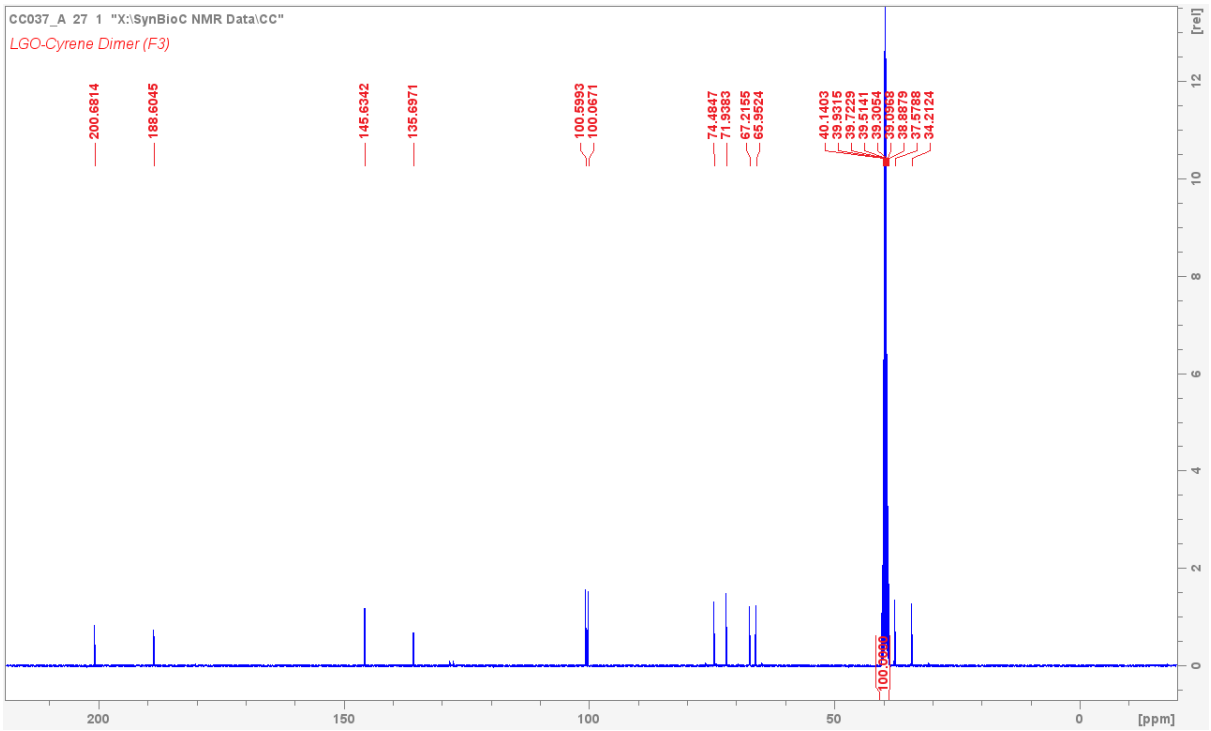
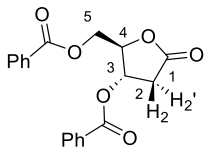


Figure S18. ^{13}C NMR spectrum of **5**

((2*R*,3*S*)-3-(benzoyloxy)-5-oxotetrahydrofuran-2-yl)methyl benzoate 6



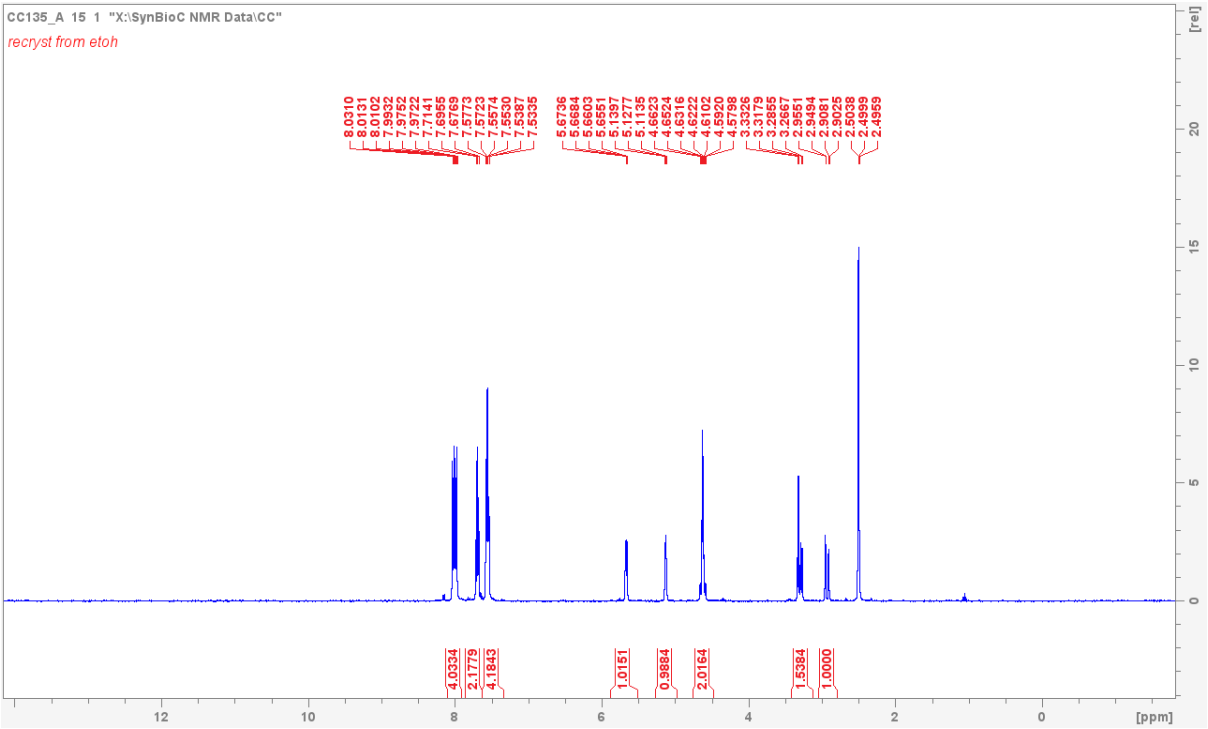


Figure S19. ^{1}H NMR spectrum of **6**

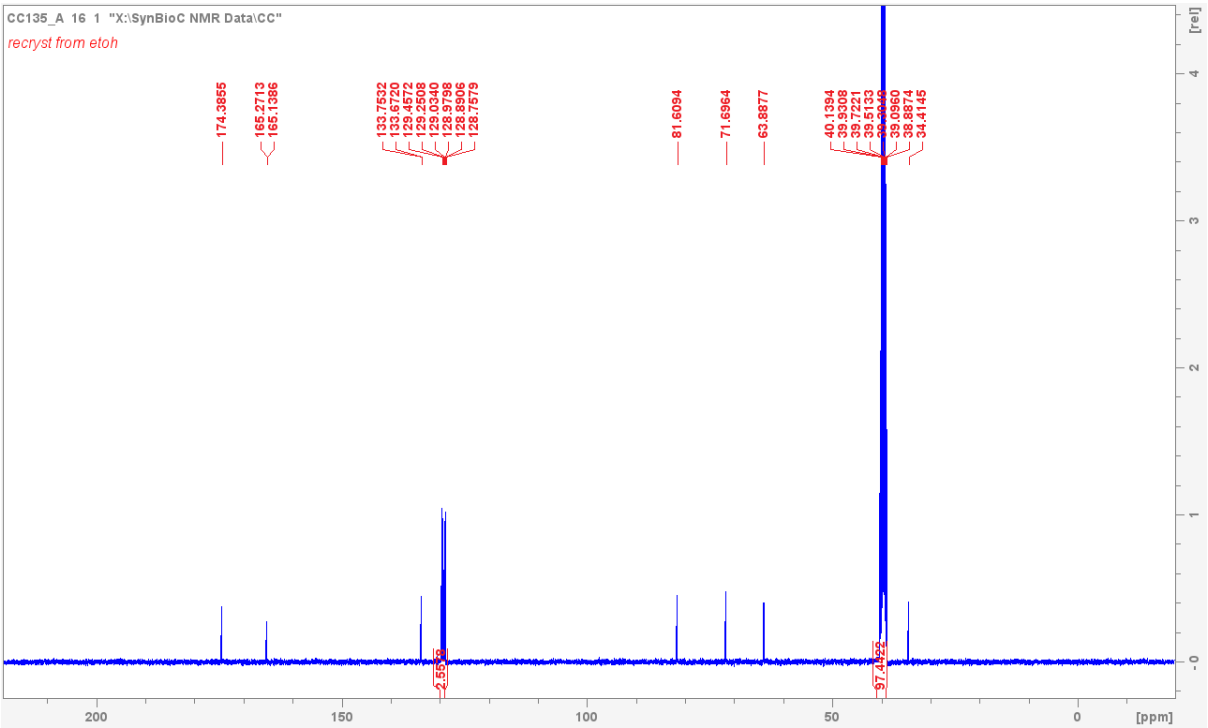
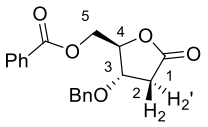


Figure S20. ^{13}C NMR spectrum of **6**

((2*R*,3)-3-(benzyloxy)-5-oxotetrahydrofuran-2-yl)methyl benzoate 7



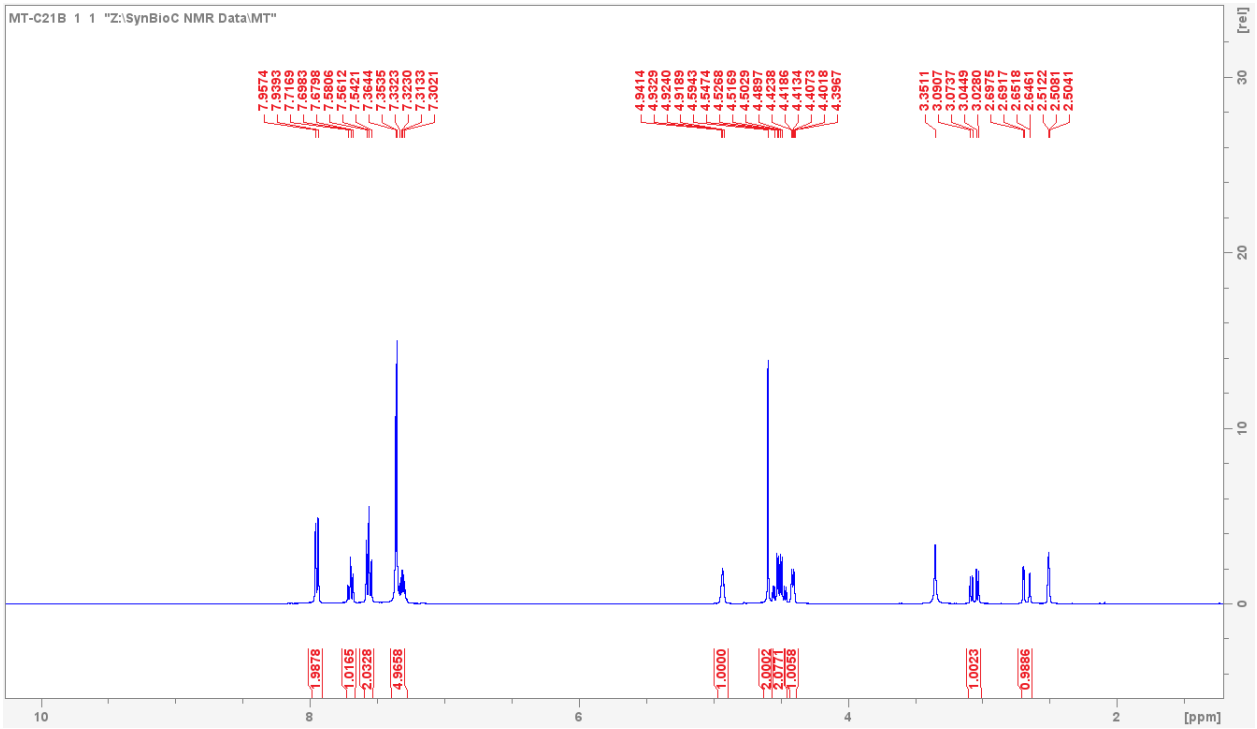


Figure S21. ^{1}H NMR spectrum of **7**

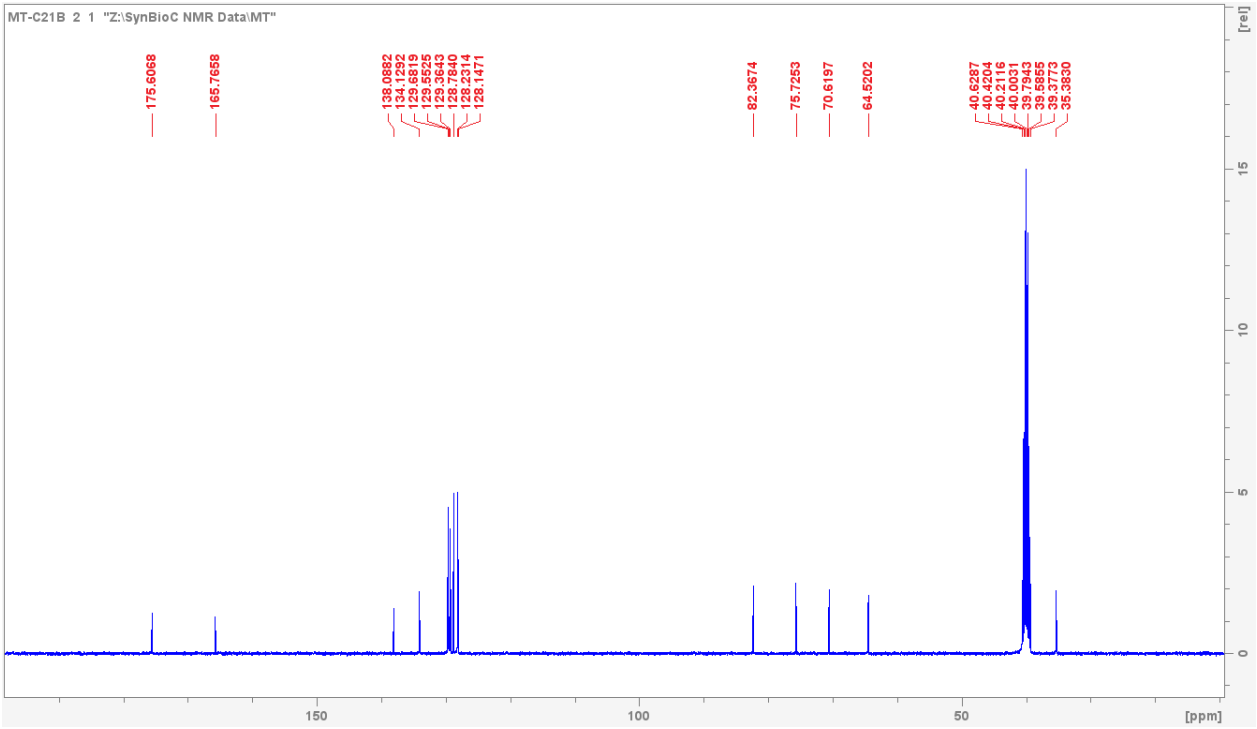


Figure S22. ^{13}C NMR spectrum of **7**