Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

A Ferrier Glycosylation / *cis*-Dihydroxylation Strategy to Synthesize *Leishmania* spp Lipophosphoglycan-Associated βGal(1,4)Man Disaccharide

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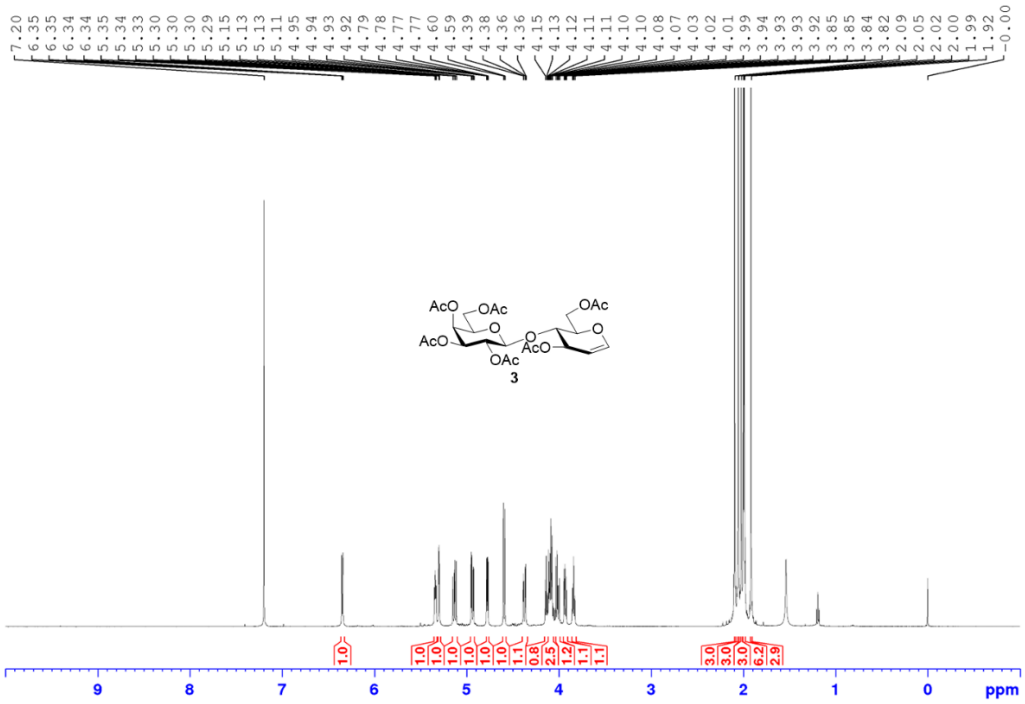

Figure S1. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of 3,6-Di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-1,5-anhydro-2-deoxy-D-arabino-hex-1-enitol **3**

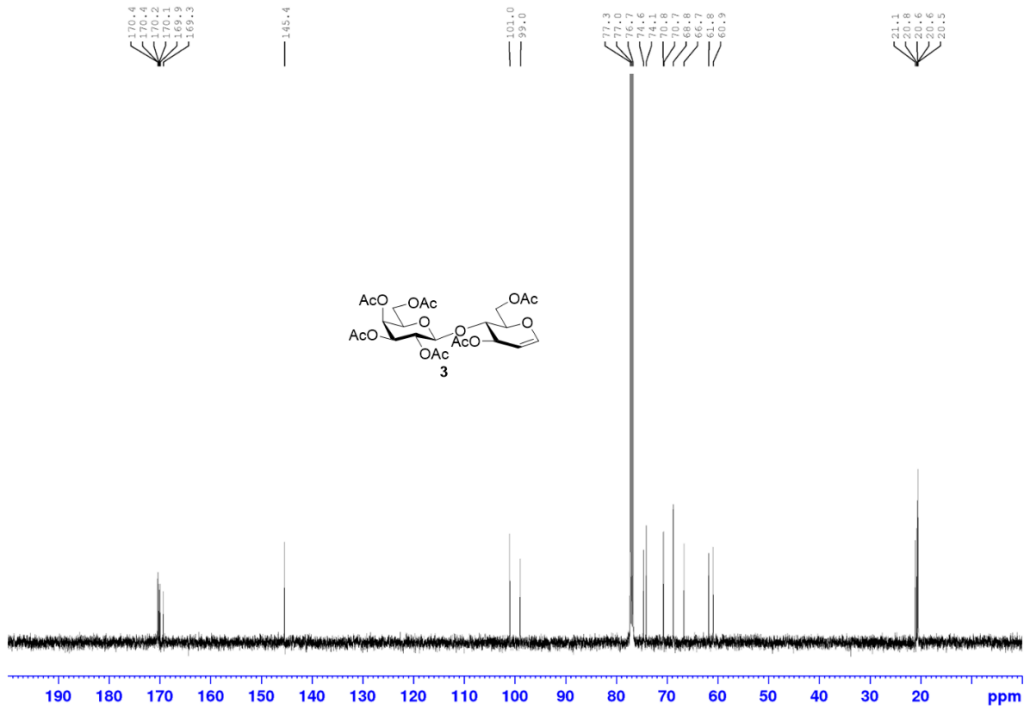

Figure S2. $^{13}C\{^{1}H\}$ NMR (125 MHz, $CDCl_3$) spectrum of 3,6-Di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-1,5-anhydro-2-deoxy-D-arabino-hex-1-enitol **3**

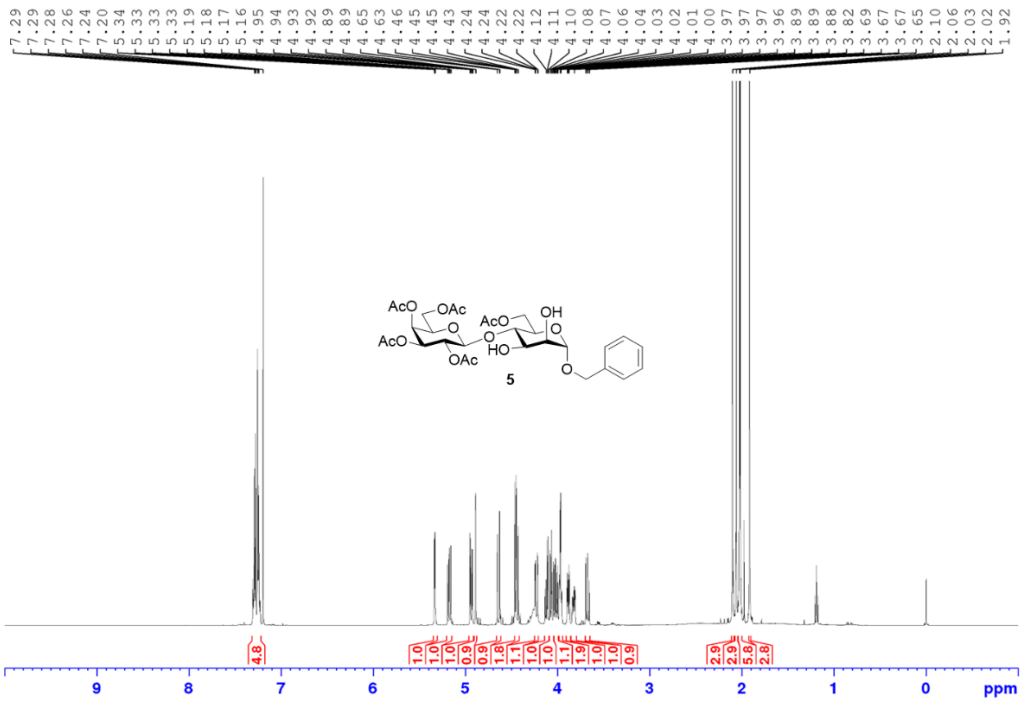

Figure S3 ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of benzyl 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **5**

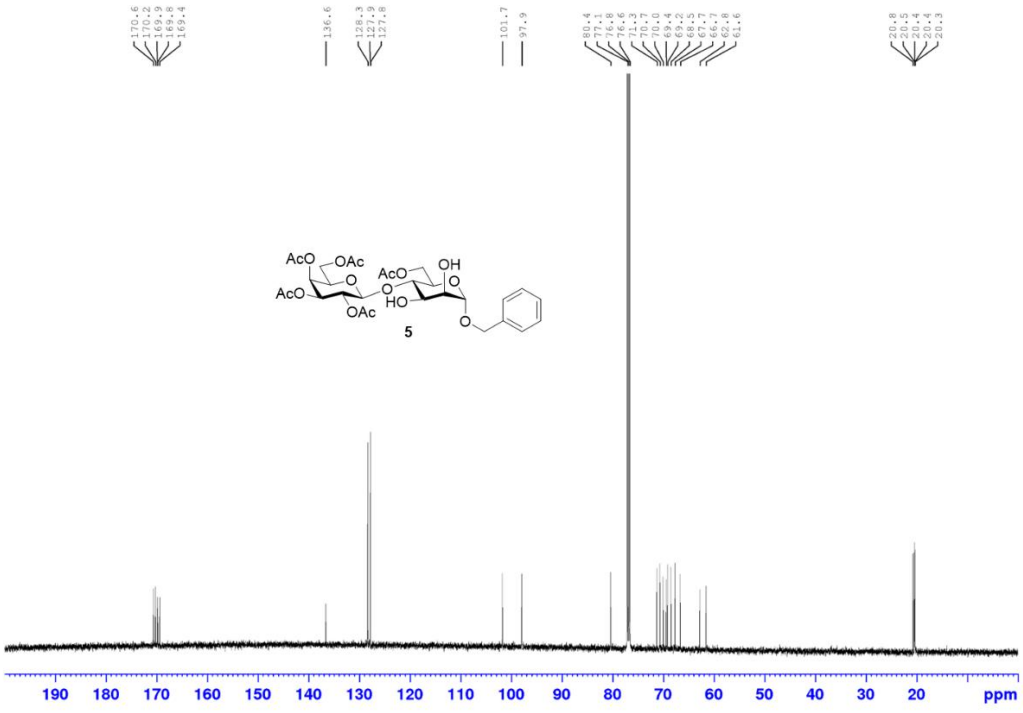

Figure S4. ^{13}C{^{1}H} NMR (125 MHz, $CDCl_3$) spectrum of benzyl 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **5**

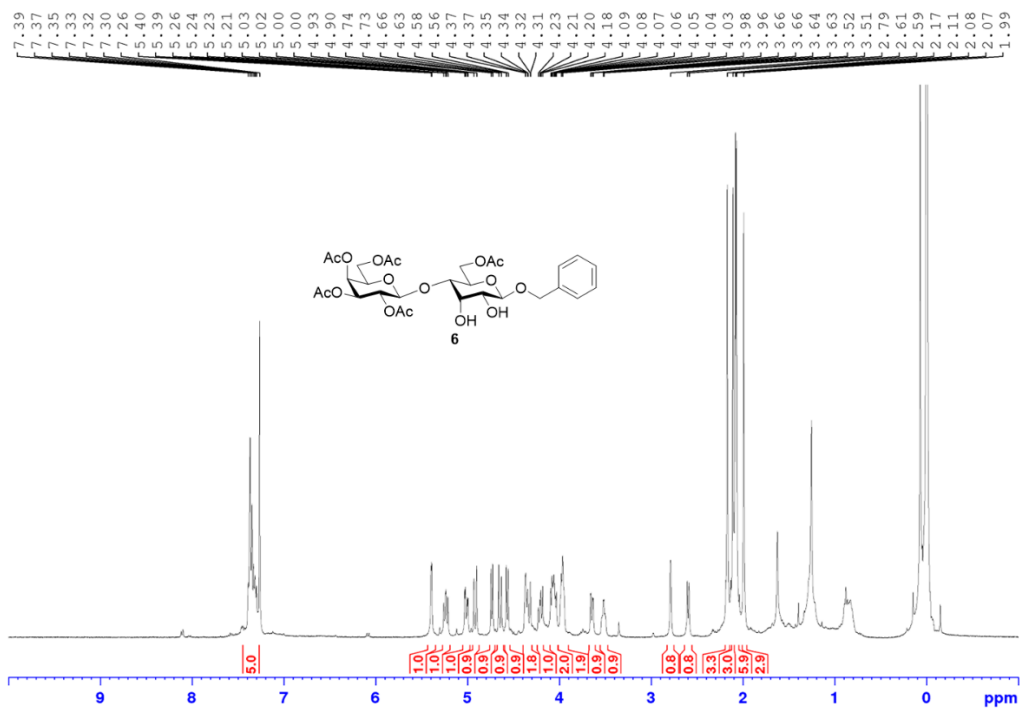

Figure S5. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of benzyl 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-allopyranoside **6**.

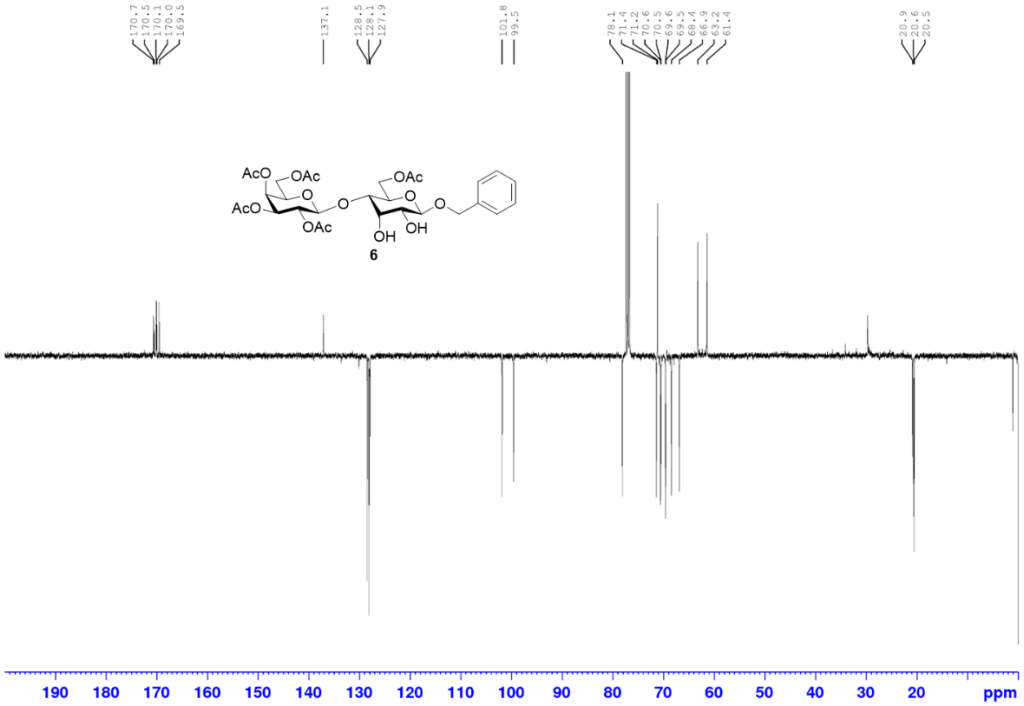

Figure S6. APT $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) spectrum of benzyl 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-allopyranoside **6**

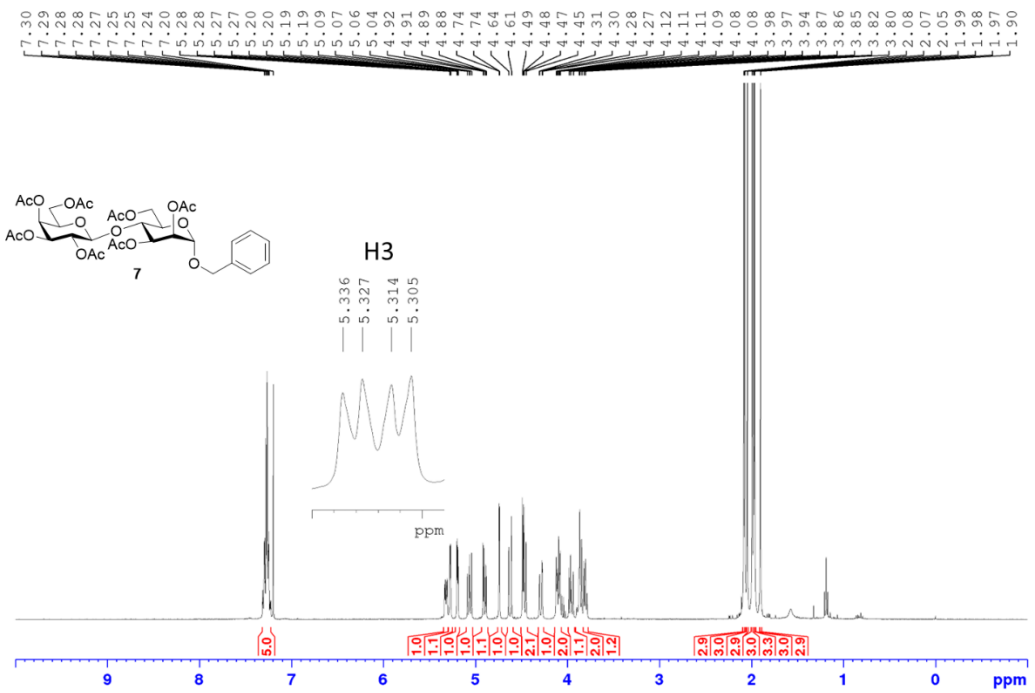

Figure S7. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **7**

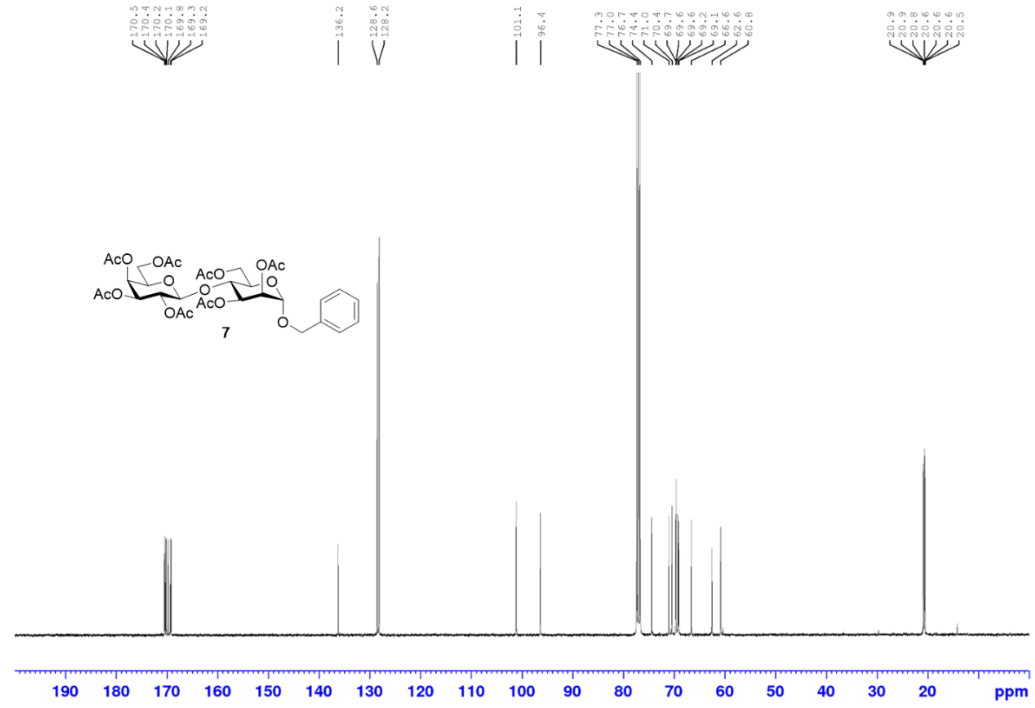

Figure S8. ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **7**

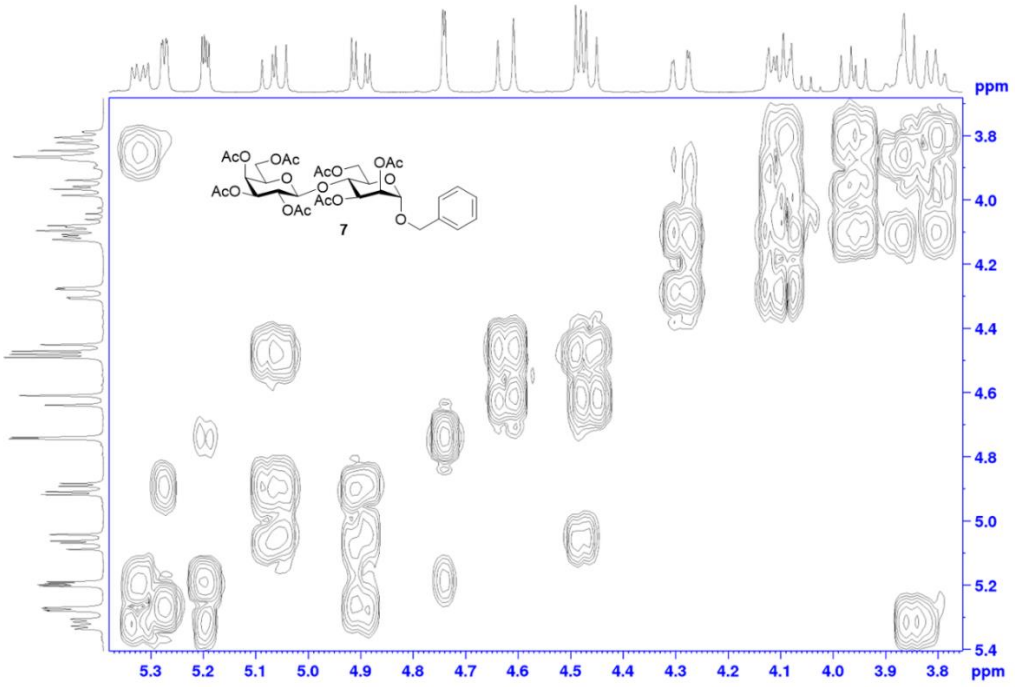

Figure S9. COSY spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **7**

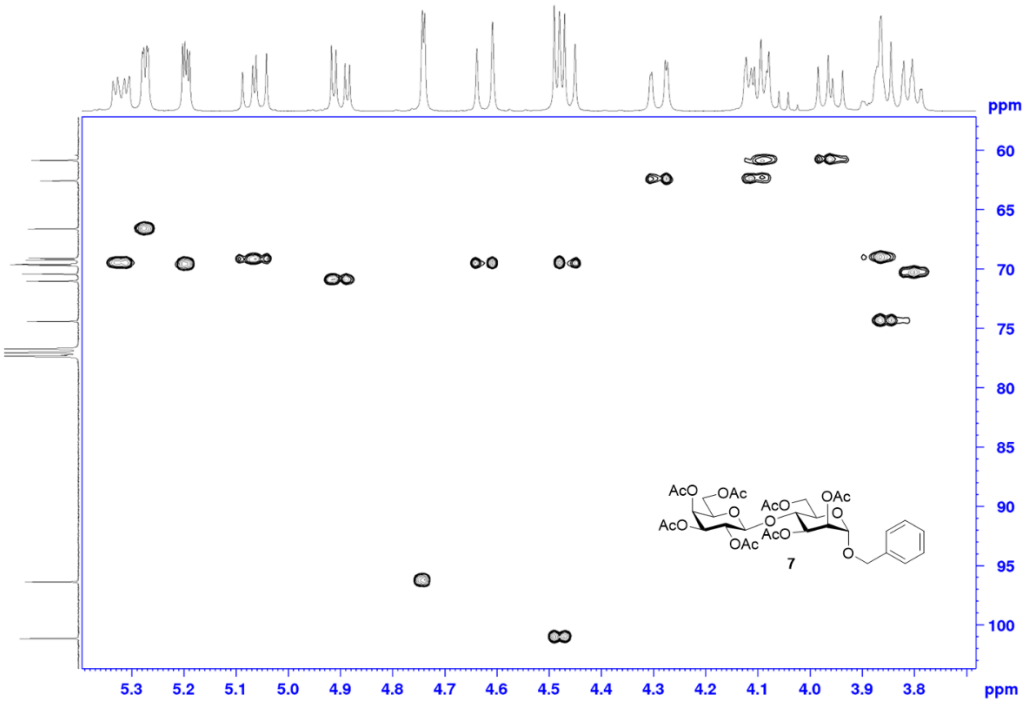

Figure S10. HSQC spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **7**

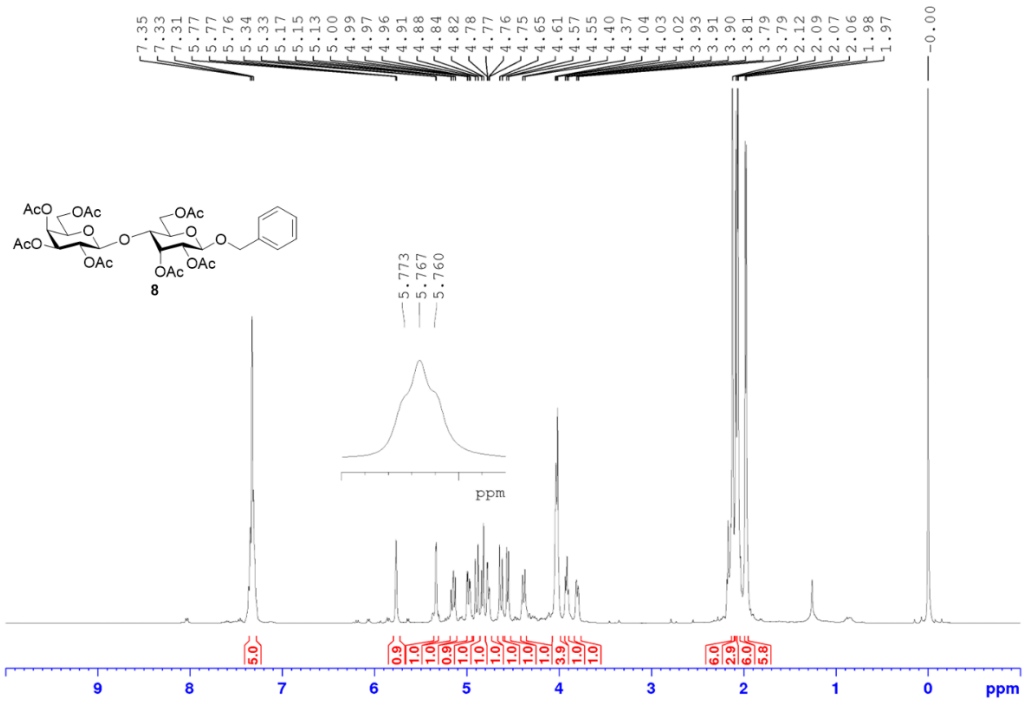

Figure S11. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-β-D-allopyranoside **8**

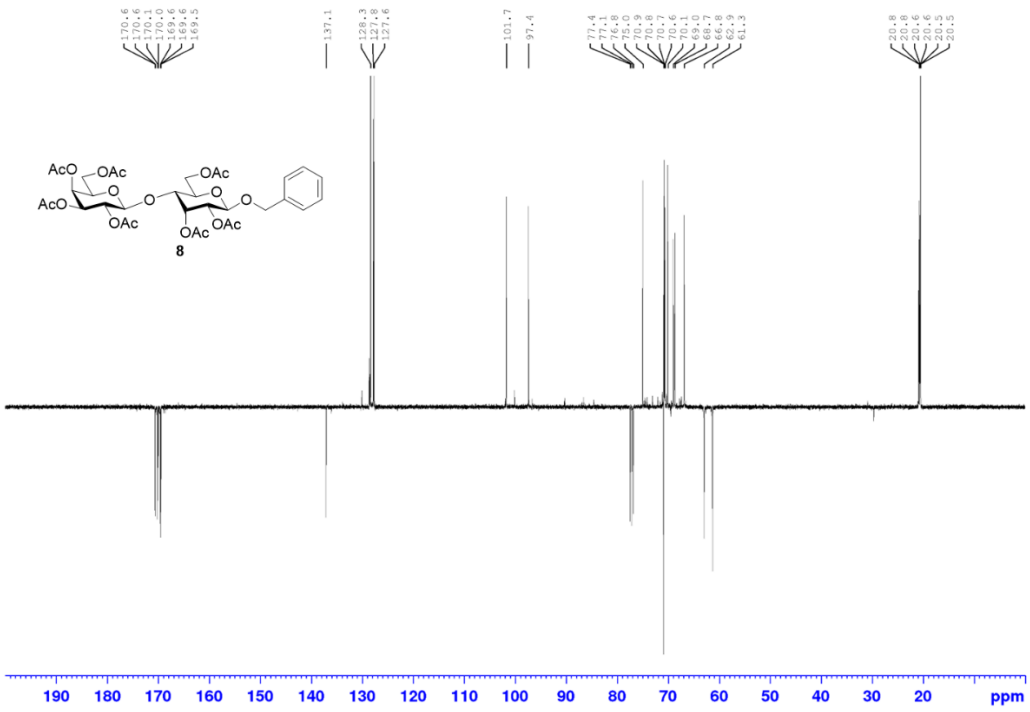

Figure S12. APT $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-β-D-allopyranoside **8**

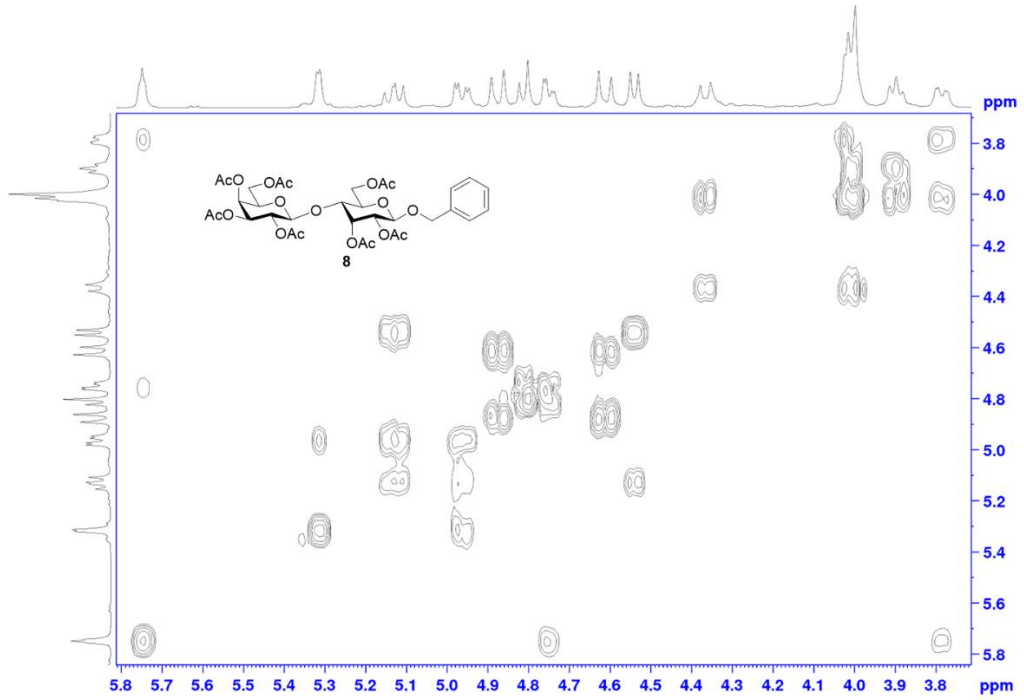

Figure S13. COSY spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-β-D-allopyranoside **8**

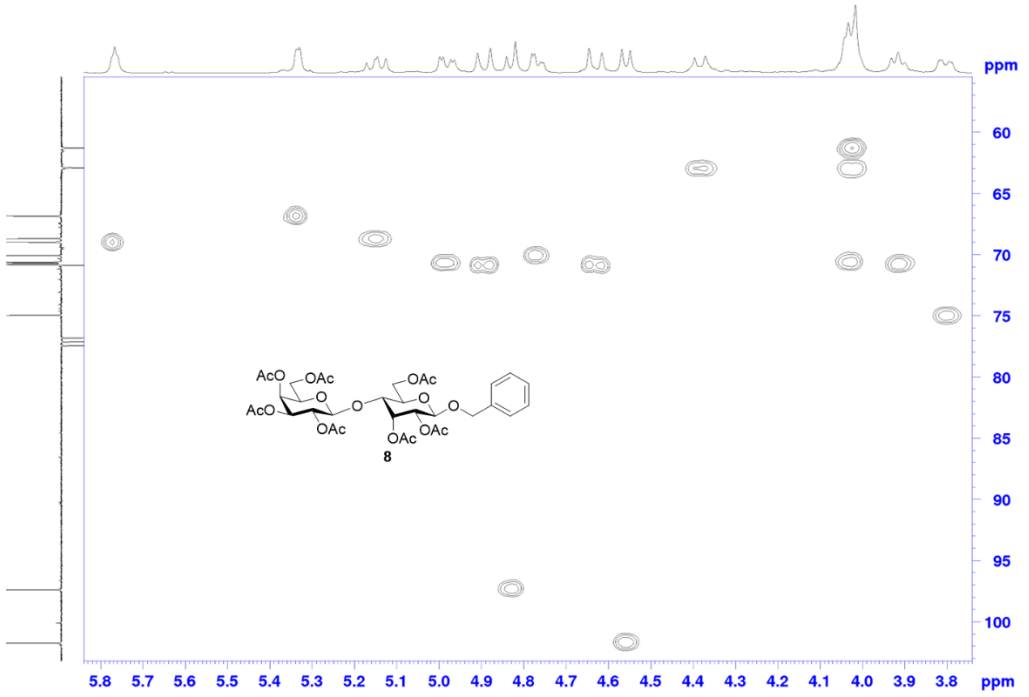

Figure S14. HSQC spectrum of benzyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-β-D-allopyranoside **8**

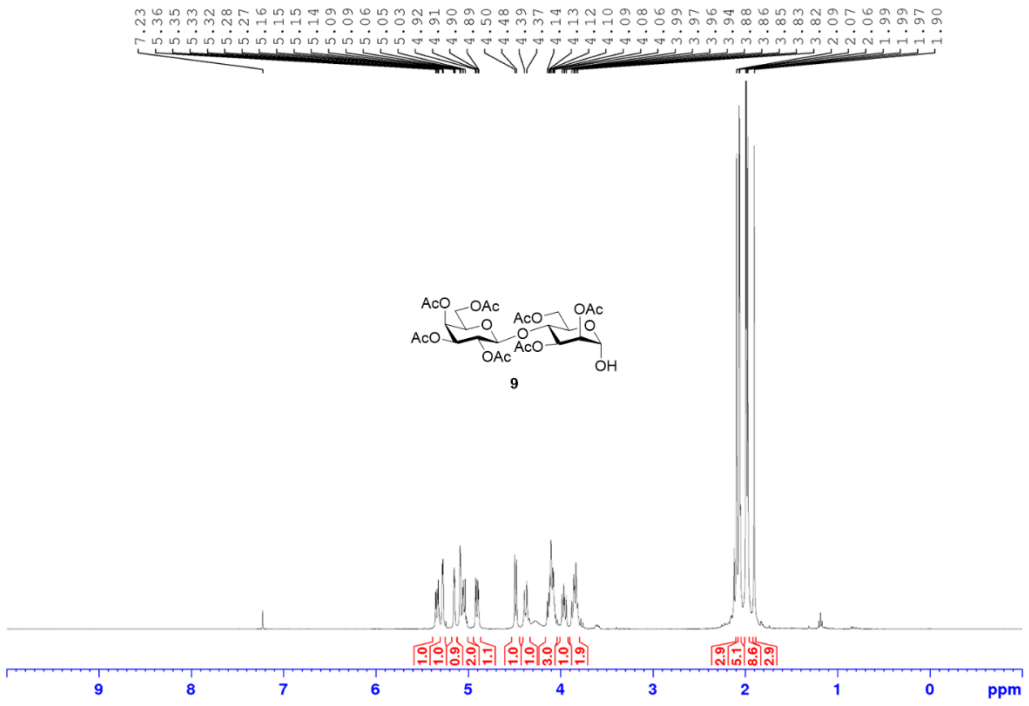

Figure S15. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranose **9**

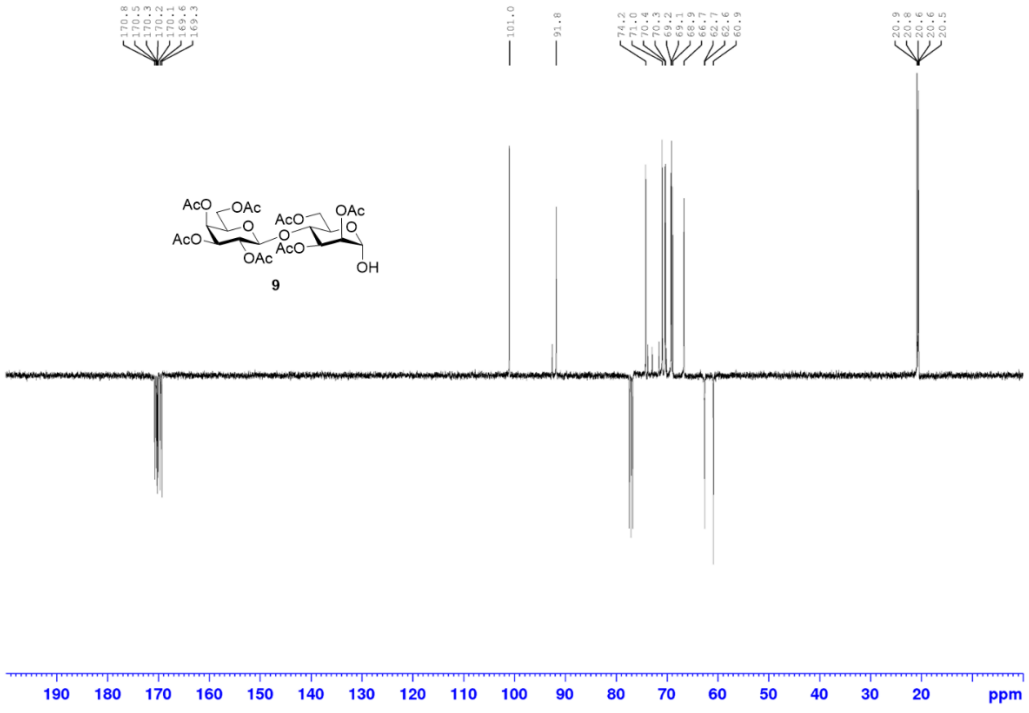

Figure S16. $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) spectrum of 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranose **9**

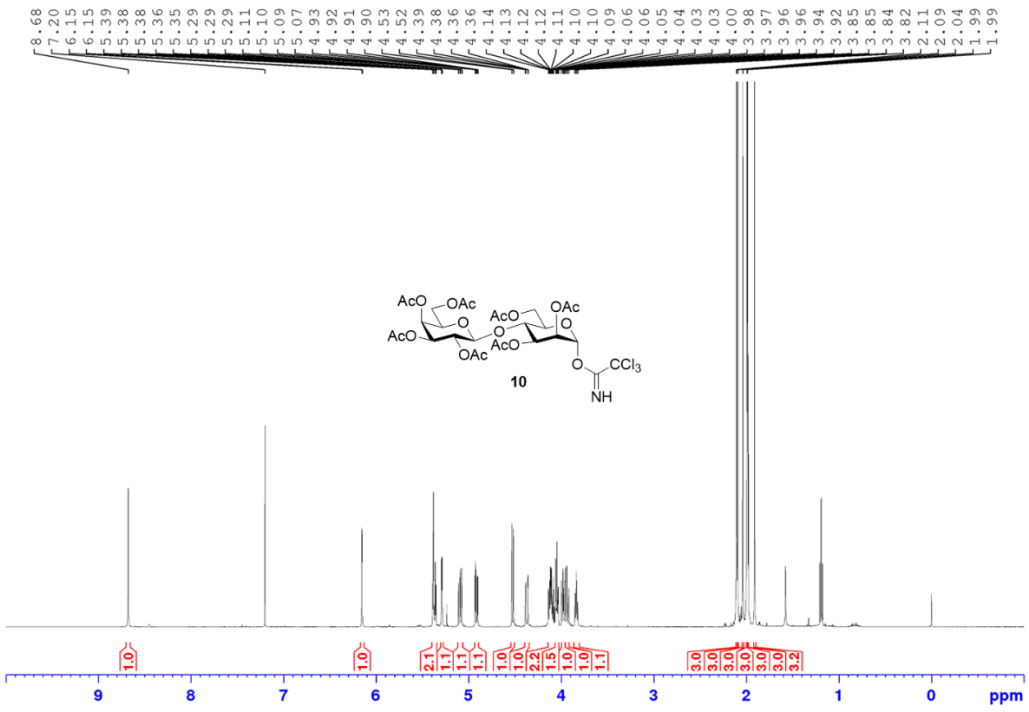

Figure S17. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-1-(2,2,2-trichloroethanimidate)-α-D-mannopyranose 2,3,6-triacetate **10**

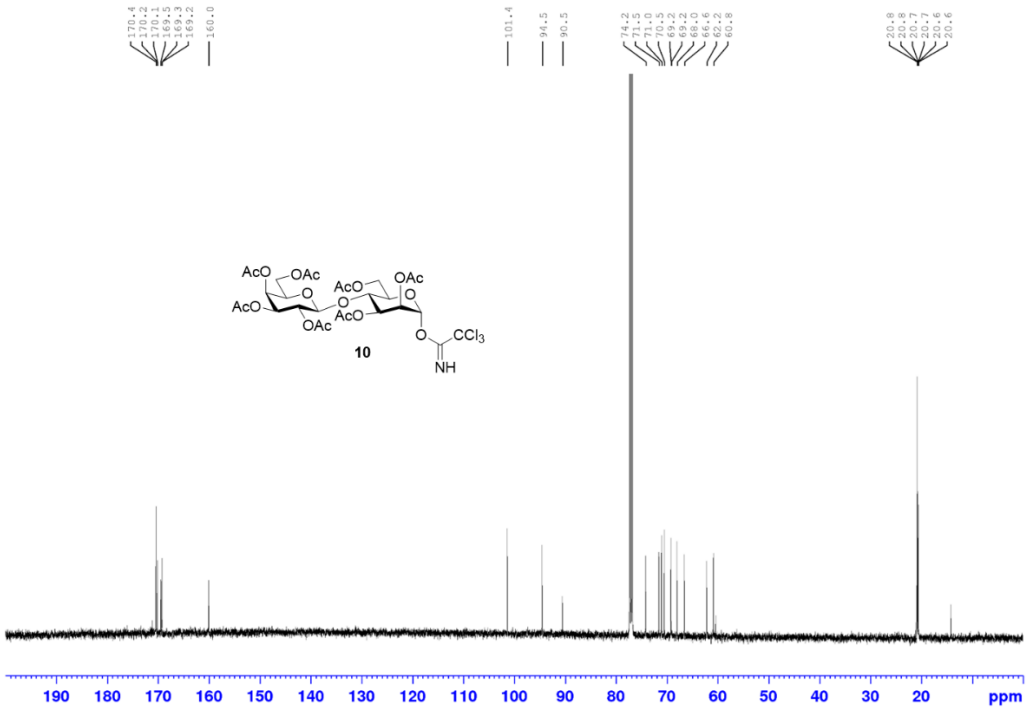

Figure S18. ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) spectrum of 4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-1-(2,2,2-trichloroethanimidate)-α-D-mannopyranose 2,3,6-triacetate **10**

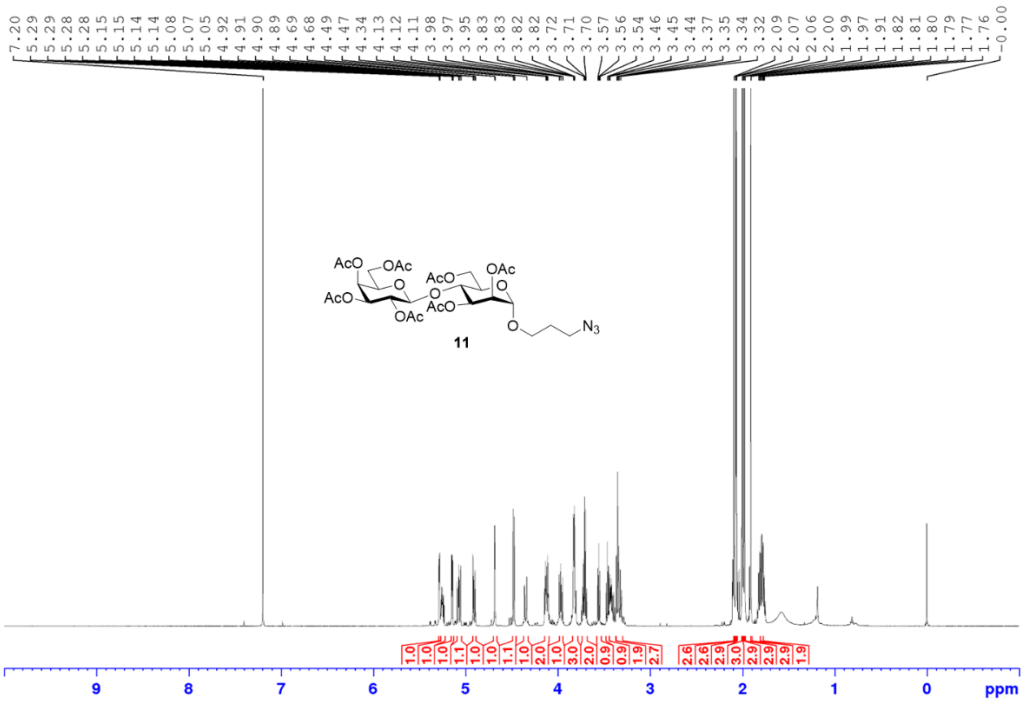

Figure S19. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of 3-azidopropyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **11**

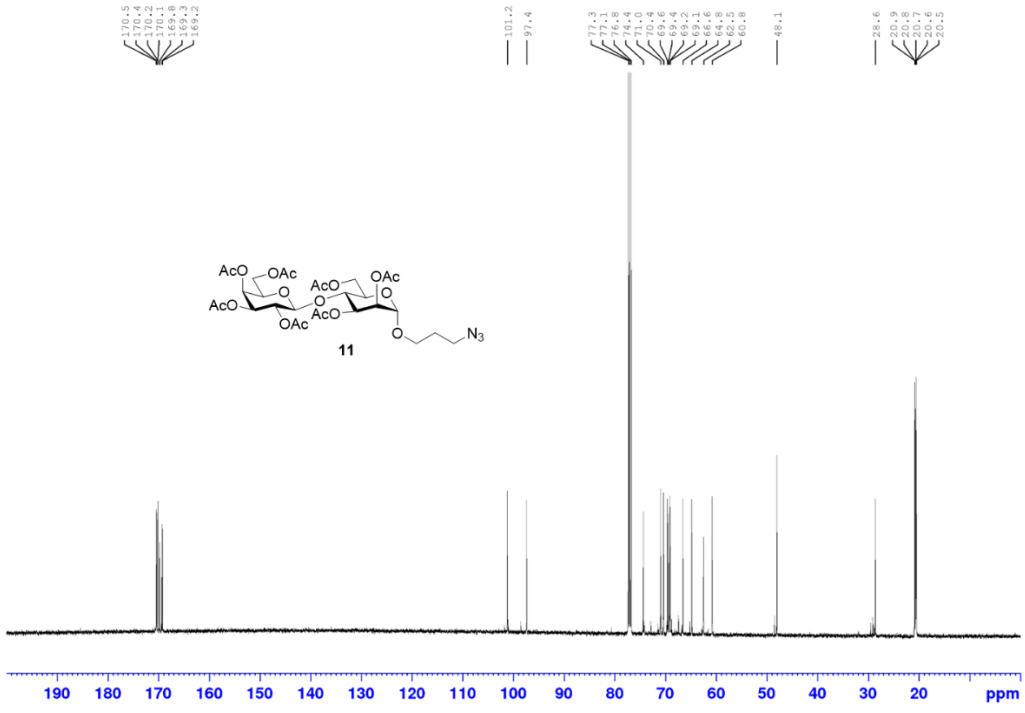

Figure S20. APT $^{13}C\{^{1}H\}$ NMR (125 MHz, $CDCl_3$) spectrum of 3-azidopropyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranoside **11**

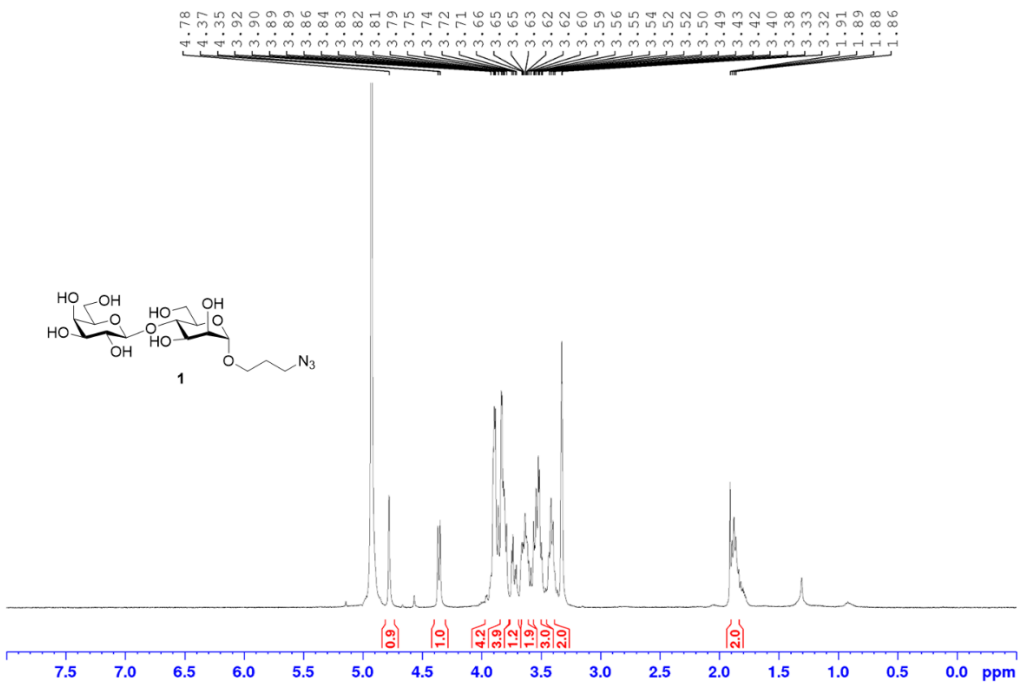

Figure S21. ^{1}H NMR (400 MHz, CD_3OD) spectrum of 3-azidopropyl 4-*O*-β-D-galactopyranosyl-α-D-mannopyranoside **1**

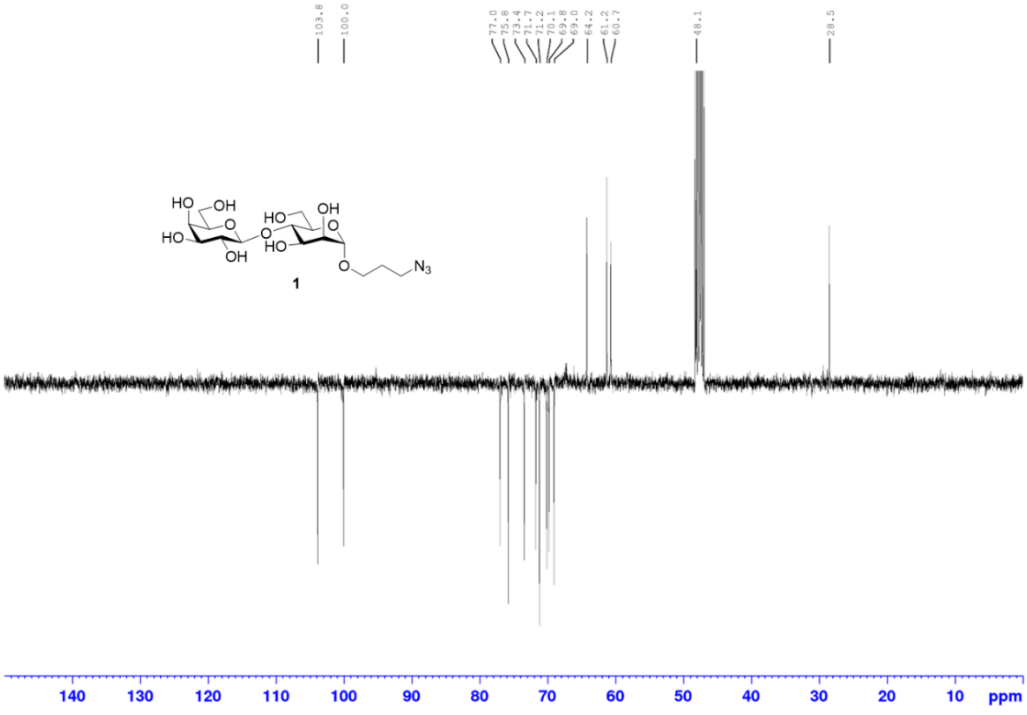

Figure S22. APT $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) spectrum of 3-azidopropyl 4-*O*-β-D-galactopyranosyl-α-D-mannopyranoside **1**

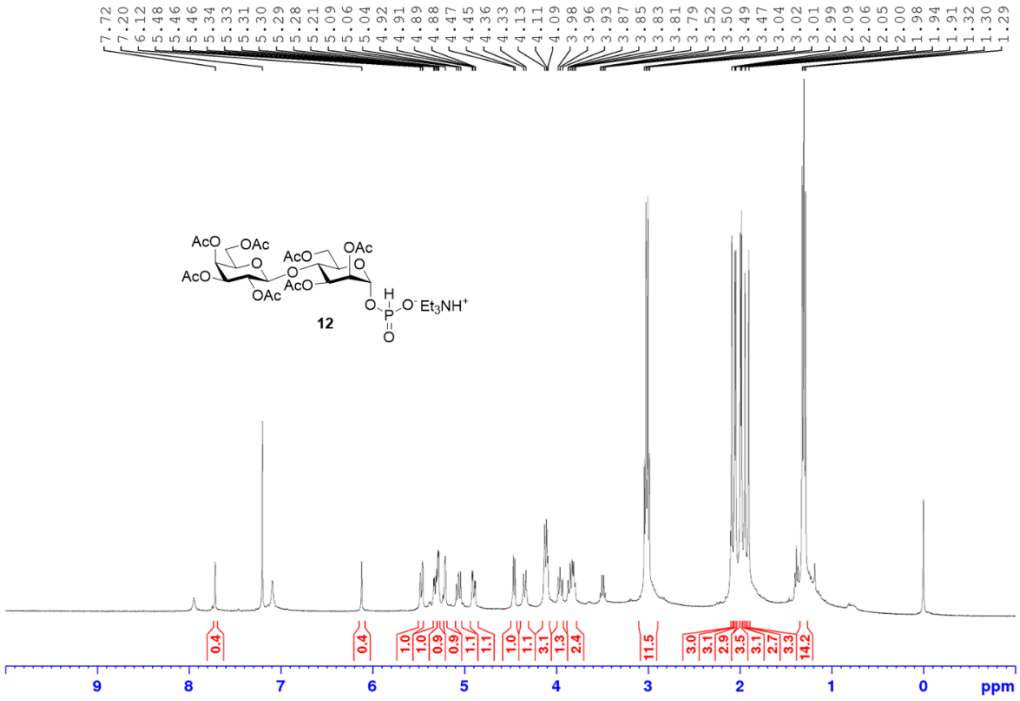

Figure S23. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl H-phosphonate **12**

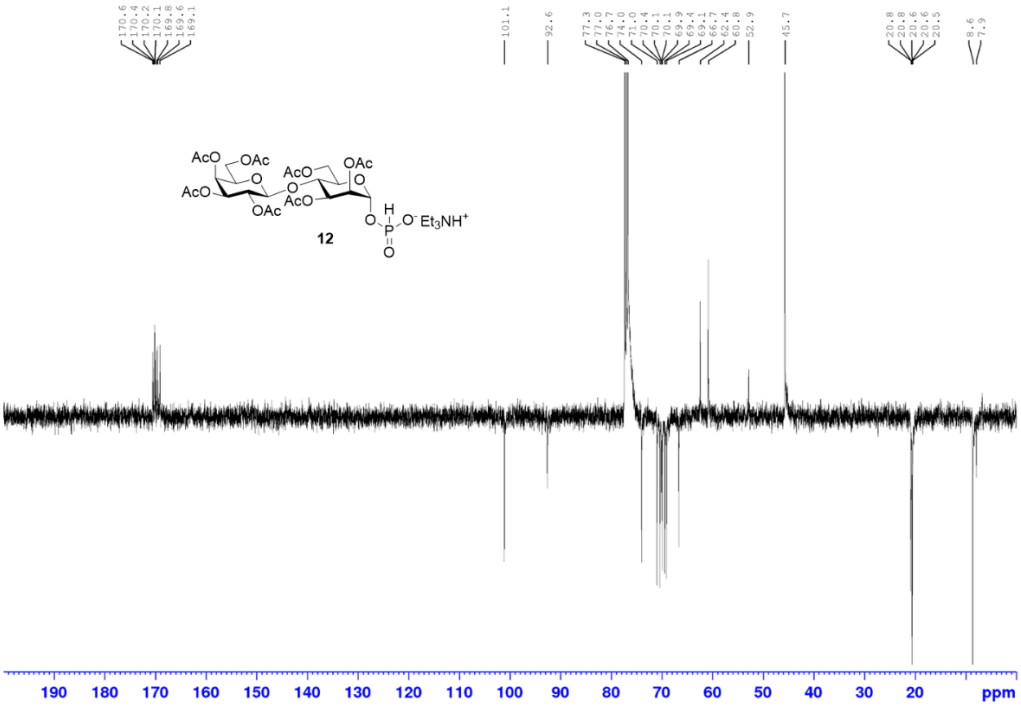

Figure S24. APT $^{13}C\{^{1}H\}$ NMR (100 MHz, $CDCl_3$) spectrum of 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl H-phosphonate **12**

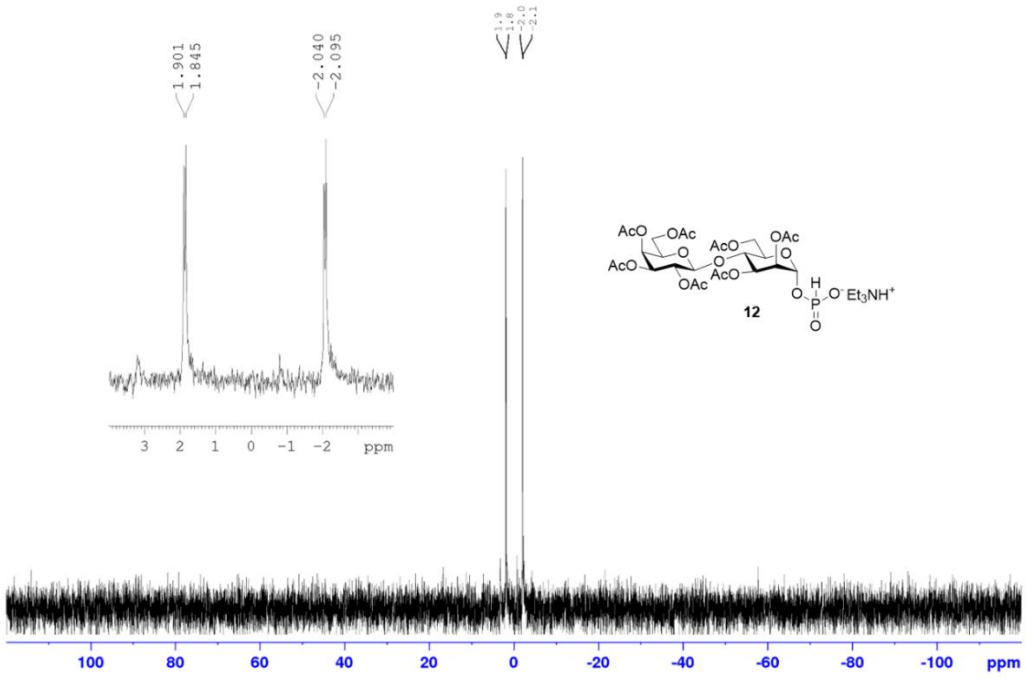

Figure S25. ^{31}P NMR (162 MHz, $CDCl_3$) spectrum of 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl H-phosphonate **12**

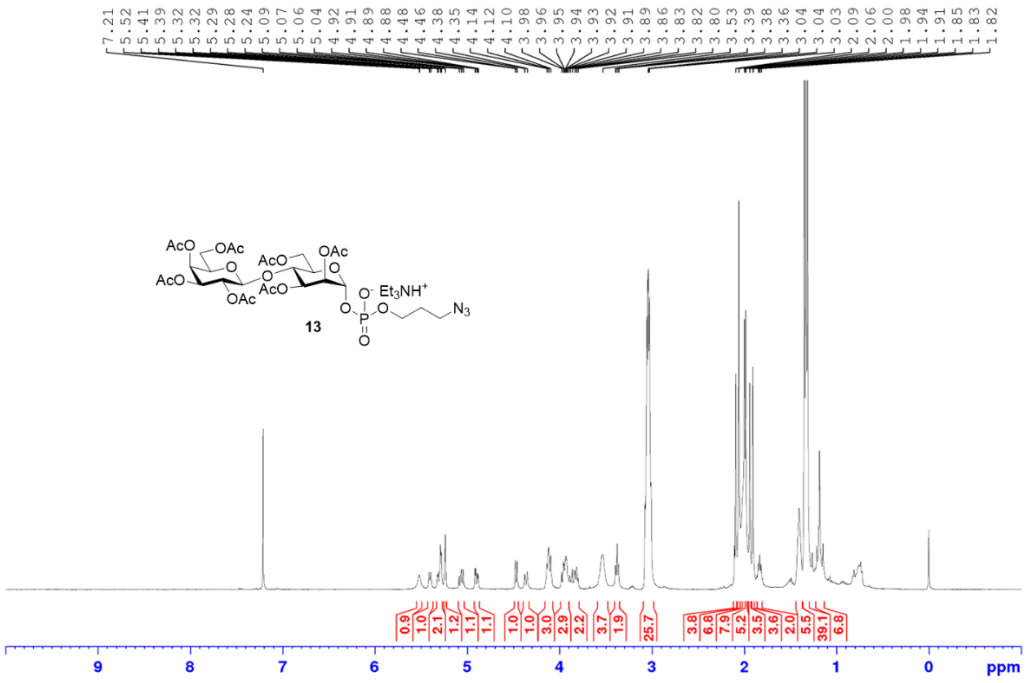

Figure S26. ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of triethylammonium 3-azidopropyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl phosphate **13**

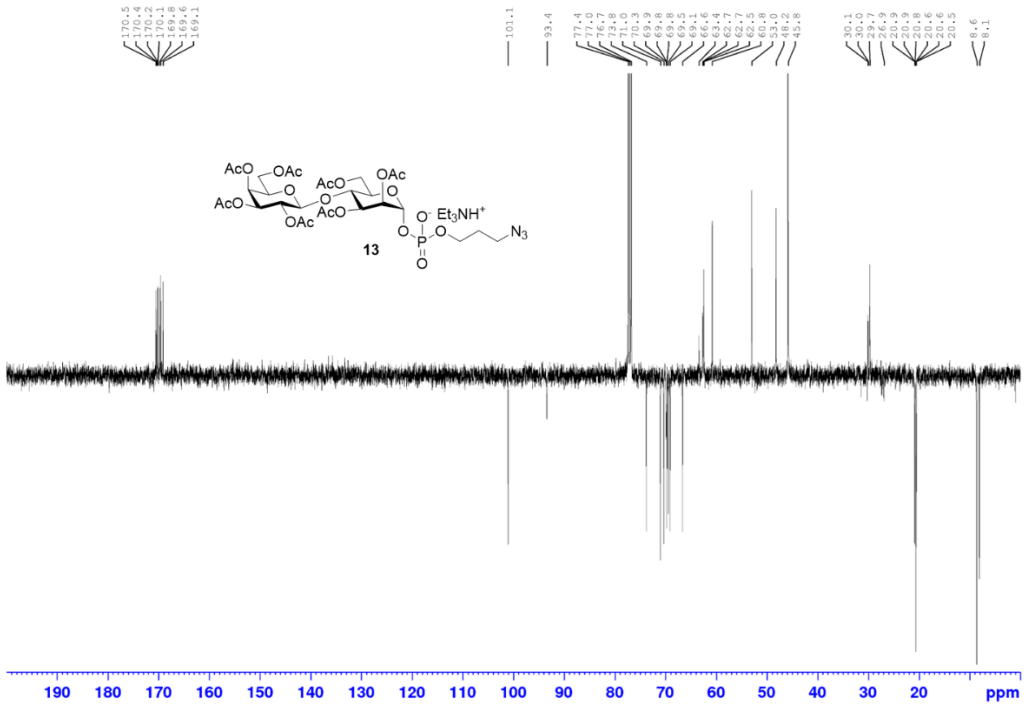

Figure S27. APT ^{13}C{^{1}H} NMR (100 MHz, $CDCl_3$) spectrum of triethylammonium 3-azidopropyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl phosphate **13**

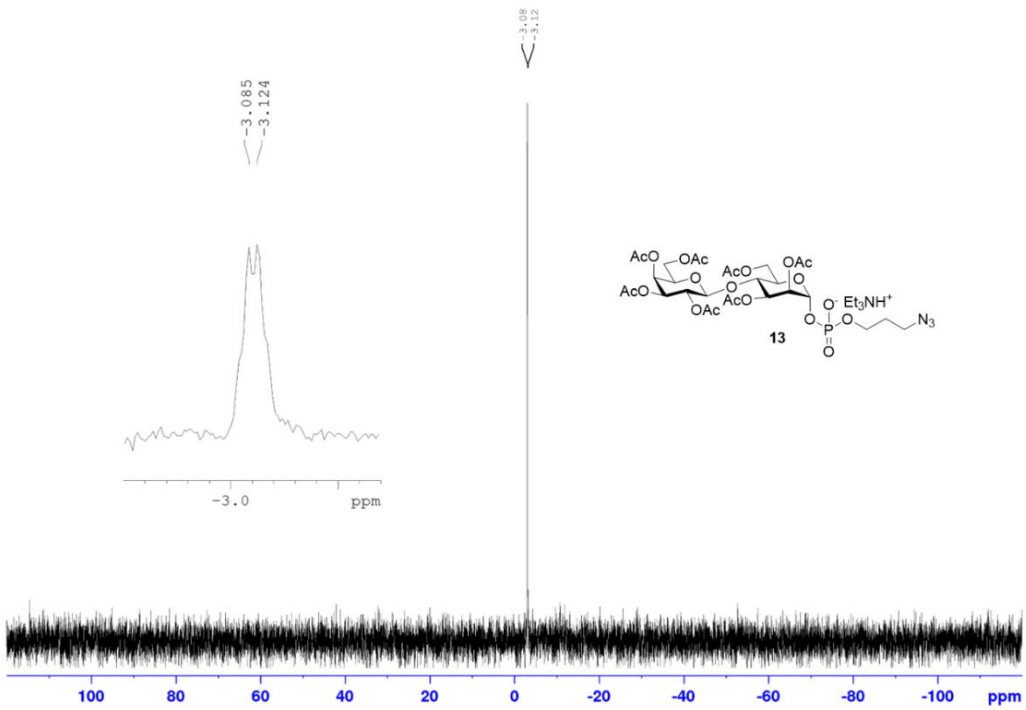

Figure S28. ^{31}P NMR (162 MHz, $CDCl_3$) spectrum of triethylammonium 3-azidopropyl 2,3-di-*O*-acetyl-4-*O*-(2,3,4,6-tetra-*O*-acetyl-β-D-galactopyranosyl)-6-*O*-acetyl-α-D-mannopyranosyl phosphate **13**

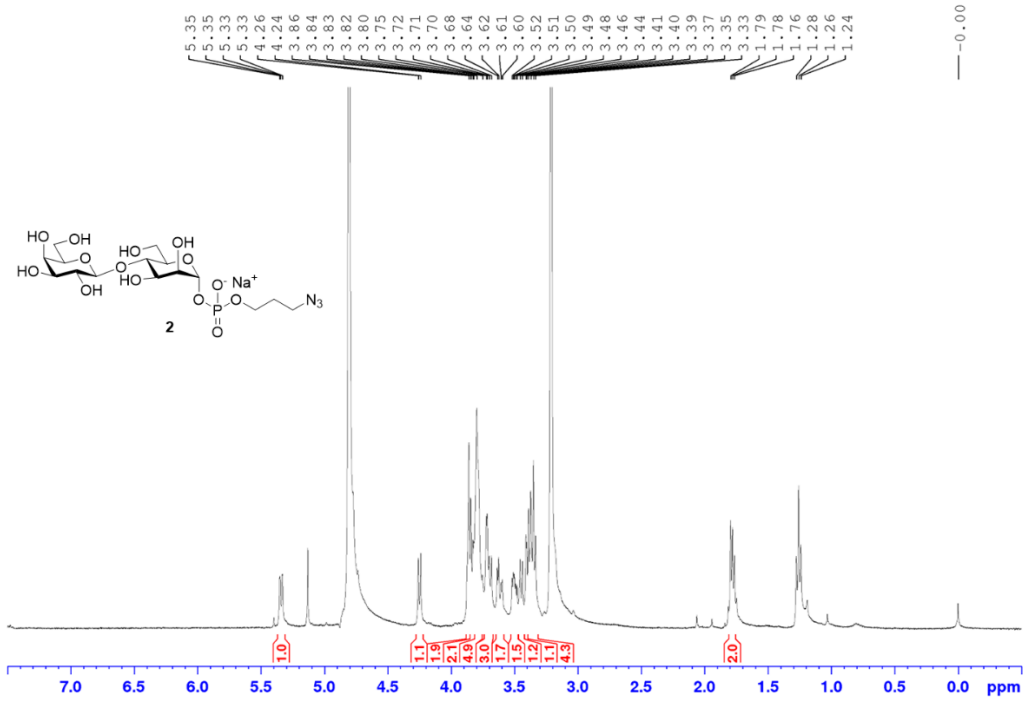

Figure S29. ^{1}H NMR (400 MHz, CD_3OD) spectrum of 3-azidopropyl 4-*O*-β-D-galactopyranosyl-α-D-mannopyranosyl phosphate **2**

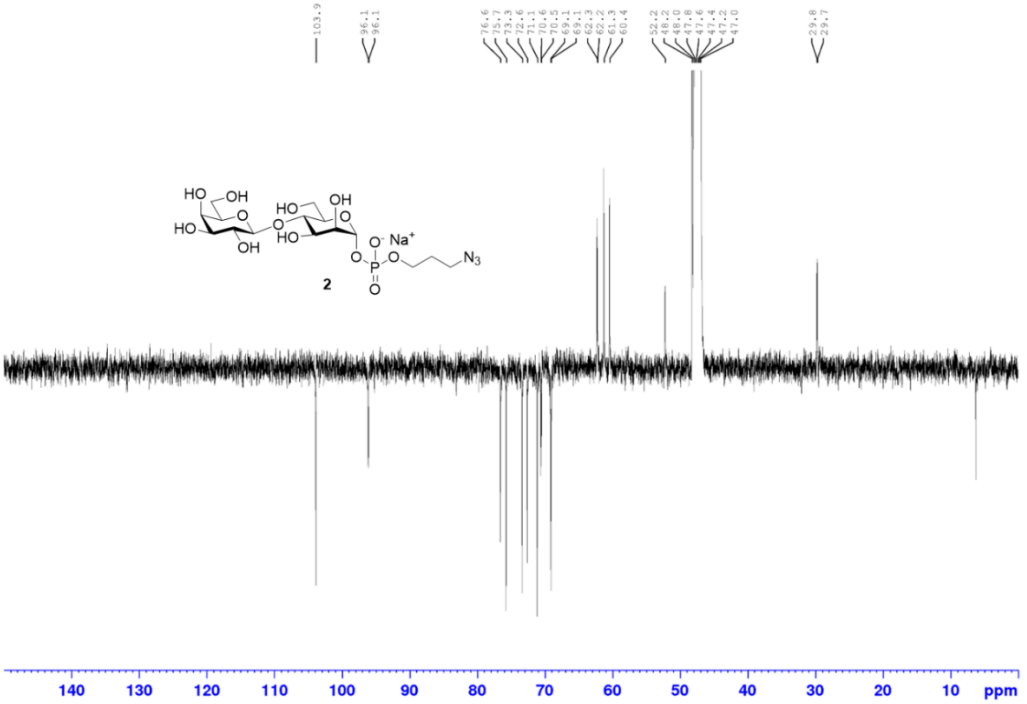

Figure S30. APT $^{13}C\{^{1}H\}$ NMR (100 MHz, CD_3OD) spectrum of 3-azidopropyl 4-*O*-β-D-galactopyranosyl-α-D-mannopyranosyl phosphate **2**

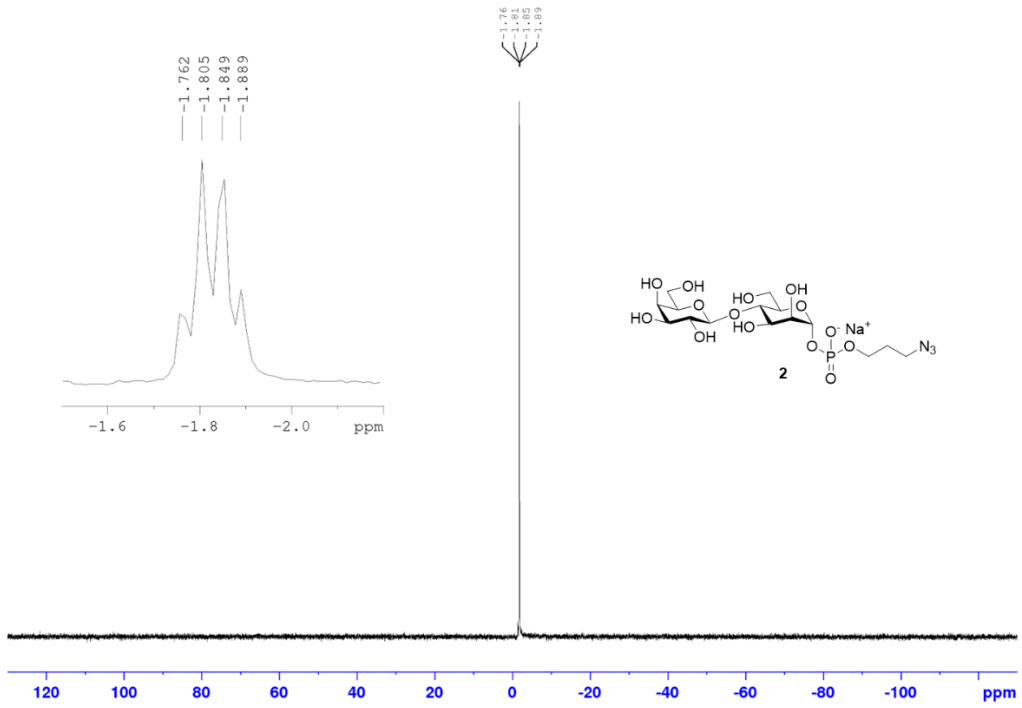

Figure S31. ^{31}P NMR (162 MHz, CD_3OD) spectrum of 3-azidopropyl 4-*O*-β-D-galactopyranosyl-α-D-mannopyranosyl phosphate **2**