Supporting Information

Influence of PEGylation on the strength of nearby salt bridges

Qiang Xiao,[a] Steven R. E. Draper,[a] Mason S. Smith, Nathan P. Brown, Natalie A. B. Pugmire, Dallin S. Ashton, Anthony J. Carter, Eliza E. K. Lawrence, and Joshua L. Price*

Department of Chemistry and Biochemistry, Brigham Young University, Provo, Utah 84602, United States

[a]These authors contributed equally.

1. Protein synthesis, purification and characterization…….....3
2. Biophysical characterization of peptide variants…….....55
3. Crystallographic characterization of 2α18 and p2α18……...89
4. References…….……..……..……90

1. Protein Synthesis, Purification and Characterization

All peptide variants were synthesized as C-terminal acids by Fmoc-based solid-phase peptide synthesis as described previously.[1] **β18, pβ18, β18-SR, pβ18-SR** and **β23** and **pβ23** were synthesized previously.[1, 2] Peptides with carboxyl termini were synthesized on Fmoc-Gly-Wang resin (EMD Biosciences) and those with amidated termini were synthesized on Rink amide resin (Advanced Chem Tech). We used standard Fmoc-protected amino acids with acid-labile sidechain protecting groups. We used previously synthesized Fmoc-L-GlnPEG4-OH [18-((((9H-fluoren-9-yl)methoxy)carbonyl)amino)-15-oxo-2,5,8,11-tetraoxa-14-azanonadecan-19-oic acid],[1] previously synthesized Fmoc-L-PrF-OH N-[(9H-Fluoren-9-ylmethoxy)-O-2-propyn-1yl-L-tyrosine,[3] and previously synthesized PEG-azide 13-azido-2,5,8,11-tetraoxatridecane[4] for PEGylating the PrF peptides via the copper (I) catalyzed azide-alkyne cycloaddition.[1] For the asparagine PEG peptides we used previously synthesized Fmoc-L-(AsnPEG4)2-OH [(*S*)-17-((((9*H*-fluoren-9-yl)methoxy)carbonyl)amino)-15-oxo-14-(2,5,8,11-tetraoxatridecan-13-yl)-2,5,8,11-tetraoxa-14-azaoctadecan-18-oic acid].[1] Other reagents we used were: 2-(1H-benzotriazole-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU) and N-hydroxybenzotriazole hydrate (HOBt) from Advanced ChemTech for amino acid activation; 20% piperidine in N,N-dimethylformamide for removal of the Fmoc protecting group from the N-terminal α- amine; a solution of a solution of phenol (0.0625 g), water (62.5 μL), thioanisole (62.5 μL), ethanedithiol (31 μL) and triisopropylsilane (12.5 μL) in trifluoroacetic acid (TFA, 1 mL)

for cleaving the protein from resin and globally removing acid-labile side-chain protecting groups. Proteins were precipitated from the TFA solution by addition of diethyl ether (~40 mL). Following centrifugation, the ether was decanted, and the pellet was dissolved in ~40mL 1:1 H2O/MeCN, then flash frozen over dry ice in acetone and lyophilized to remove volatile impurities. The resulting powder was stored at -20°C until purification.

Proteins were purified by preparative reverse-phase high performance liquid chromatography (HPLC) on a C18 column using a linear gradient of water in acetonitrile with 0.1% v/v TFA. Fractions containing the desired protein product were pooled, frozen, and lyophilized. Proteins were identified by electrospray ionization time of flight mass spectrometry (ESI-TOF); expected and observed exact masses mass spectra appear in Table S1, S2 and S3 and spectra appear in Figures S1-S63. Protein purity was assessed by Analytical HPLC (Figures S64-S127).

Table S1. Sequences, molecular formulas, expected and observed m/z ratios for GCN4 variants.

Peptide	Sequence	Molecular Formula	z	Expected [M+z·H]/z	Observed [M+z·H]/z
2α1	Ac-**N**MKQLEDKVEELLSKNYHLENEVARLKKLVG-NH_2	$C_{163}H_{274}N_{46}O_{50}$	4	928.009	927.987
p2α1	Ac-**N**•••••••••••••••••••••••••••••-NH_2	$C_{172}H_{292}N_{46}O_{54}$	4	975.539	975.539
2α3	Ac-RM**N**QLEDKVEELLSKNYHLENEVARLKKLVG -NH_2	$C_{163}H_{274}N_{48}O_{50}$	4	935.010	935.015
p2α3	Ac-••**N**•••••••••••••••••••••••••••-NH_2	$C_{172}H_{292}N_{48}O_{54}$	4	982.541	982.535
2α4	Ac-RMK**N**LED**K**VE**E**LLSKNYHLENEVARLKKLVG-NH_2	$C_{164}H_{278}N_{48}O_{49}$	4	935.020	935.016
2α4-KA	Ac-•••**N**LED**K**VE**A**••••••••••••••••••-NH_2	$C_{162}H_{276}N_{48}O_{47}$	4	920.518	920.522
2α4-AE	Ac-•••**N**LED**A**VE**E**••••••••••••••••••-NH_2	$C_{161}H_{271}N_{47}O_{49}$	4	920.755	920.759
2α4-AA	Ac-•••**N**LED**A**VE**A**••••••••••••••••••-NH_2	$C_{159}H_{269}N_{47}O_{47}$	4	906.254	906.257
p2α4	Ac-•••**N**LED**K**VE**E**••••••••••••••••••-NH_2	$C_{173}H_{296}N_{48}O_{53}$	4	982.550	982.550
2α4-KA	Ac-•••**N**LED**K**VE**A**••••••••••••••••••-NH_2	$C_{171}H_{294}N_{48}O_{51}$	4	968.051	968.051
2α4-AE	Ac-•••**N**LED**A**VE**E**••••••••••••••••••-NH_2	$C_{170}H_{289}N_{47}O_{53}$	4	968.285	968.289
2α4-AA	Ac-•••**N**LED**A**VE**A**••••••••••••••••••-NH_2	$C_{168}H_{287}N_{47}O_{51}$	4	953.787	953.787
2α6	Ac-RMKQL**N**DKVEELLSKNYHLENEVARLKKLVG-NH_2	$C_{164}H_{279}N_{49}O_{48}$	4	934.774	934.765
p2α6	Ac-•••••**N**•••••••••••••••••••••••••-NH_2	$C_{173}H_{297}N_{49}O_{52}$	4	982.304	982.298
2α7	Ac-RMKQLE**N**KVEELLSKNYHLENEVARLKKLVG-NH_2	$C_{165}H_{281}N_{49}O_{48}$	4	938.277	938.273
p2α7	Ac-••••••**N**•••••••••••••••••••••••-NH_2	$C_{185}H_{318}N_{54}O_{56}$	4	985.808	985.802
2α10	Ac-RMKQLEDKV**N**ELLSKNYHLENEVARLKKLVG-NH_2	$C_{164}H_{279}N_{49}O_{48}$	4	934.774	934.770
p2α10	Ac-••••••••••**N**•••••••••••••••••••-NH_2	$C_{173}H_{297}N_{49}O_{52}$	4	982.304	982.302
2α14	Ac-RMKQLEDKVEELL**N**KNYHLENEVARLKKLVG-NH_2	$C_{166}H_{281}N_{49}O_{49}$	4	945.276	945.268
p2α14	Ac-••••••••••••••**N**•••••••••••••••-NH_2	$C_{175}H_{299}N_{49}O_{53}$	4	992.806	992.806
2α18	Ac-RMKQLEDKVEELLSKNY**N**LEN**E**VA**R**LKKLVG-NH_2	$C_{163}H_{279}N_{47}O_{50}$	4	932.769	932.762
2α18-EA	Ac-••••••••••••••••••**N**LEN**E**VA**A**•••••••-NH_2	$C_{160}H_{272}N_{44}O_{50}$	4	911.503	911.505
2α18-AR	Ac-••••••••••••••••••**N**LEN**A**VA**R**•••••••-NH_2	$C_{161}H_{277}N_{47}O_{48}$	4	918.268	918.271
2α18-AA	Ac-••••••••••••••••••**N**LEN**A**VA**A**•••••••-NH_2	$C_{158}H_{270}N_{44}O_{48}$	4	897.002	897.006
p2α18	Ac-••••••••••••••••••**N**LEN**E**VA**R**•••••••-NH_2	$C_{172}H_{297}N_{47}O_{54}$	4	980.300	980.298
p2α18-EA	Ac-••••••••••••••••••**N**LEN**E**VA**A**•••••••-NH_2	$C_{169}H_{290}N_{44}O_{54}$	4	959.034	959.036
p2α18-AR	Ac-••••••••••••••••••**N**LEN**A**VA**R**•••••••-NH_2	$C_{170}H_{295}N_{47}O_{52}$	4	965.798	965.802
p2α18-AA	Ac-••••••••••••••••••**N**LEN**A**VA**A**•••••••-NH_2	$C_{167}H_{288}N_{44}O_{52}$	4	944.532	944.536
2α21	Ac-RMKQLEDKVEELLSKNYHLE**N**EVARLKKLVG-NH_2	$C_{165}H_{280}N_{48}O_{49}$	4	938.523	938.516
p2α21	Ac-••••••••••••••••••••**N**••••••••••-NH_2	$C_{174}H_{298}N_{48}O_{53}$	4	986.054	986.053
2α25	Ac-RMKQLEDKVEELLSKNYHLENEV**N**RLKKLVG-NH_2	$C_{166}H_{281}N_{49}O_{50}$	4	949.275	949.268
p2α25	Ac-••••••••••••••••••••••••**N**•••••••-NH_2	$C_{175}H_{299}N_{49}O_{54}$	4	996.805	996.805
2α28	Ac-RMKQLEDKVEELLSKNYHLENEVARLK**N**LVG-NH_2	$C_{163}H_{274}N_{48}O_{50}$	4	935.010	935.013
p2α28	Ac-••••••••••••••••••••••••••**N**•••-NH_2	$C_{172}H_{292}N_{48}O_{54}$	4	982.541	982.541

Table S2. Sequences, molecular formulas, expected and observed m/z ratios for 1CW variants.

Name	Sequence	Molecular Formula	z	Expected [M+z·H]/z	Observed [M+z·H]/z
3α1	Ac-QVEALEKKVAALESKVQALEKKVEALEY-NH_2	$C_{143}H_{242}N_{36}O_{45}$	3	1062.267	1062.264
3α1-ER	Ac-QVEALER••••••••••••••••••••••-NH_2	$C_{143}H_{242}N_{38}O_{45}$	3	1071.602	1071.615
3α1-EA	Ac-QVEALEA••••••••••••••••••••••-NH_2	$C_{140}H_{235}N_{35}O_{45}$	3	1043.247	1043.245
3α1-AK	Ac-QVAALEK••••••••••••••••••••••-NH_2	$C_{141}H_{240}N_{36}O_{43}$	3	1042.931	1042.929
3α1-AR	Ac-QVAALER••••••••••••••••••••••-NH_2	$C_{141}H_{240}N_{38}O_{43}$	3	1052.267	1052.280
3α1-AA	Ac-QVAALEA••••••••••••••••••••••-NH_2	$C_{138}H_{233}N_{35}O_{43}$	3	1023.912	1023.908
p3α1	Ac-QVEALEK••••••••••••••••••••••-NH_2	$C_{152}H_{260}N_{36}O_{49}$	3	1125.640	1125.636
p3α1-ER	Ac-QVEALER••••••••••••••••••••••-NH_2	$C_{152}H_{260}N_{38}O_{49}$	3	1134.976	1134.986
p3α1-EA	Ac-QVEALEA••••••••••••••••••••••-NH_2	$C_{149}H_{253}N_{35}O_{49}$	3	1106.621	1106.616
p3α1-AK	Ac-QVAALEK••••••••••••••••••••••-NH_2	$C_{150}H_{258}N_{36}O_{47}$	3	1106.305	1106.301
p3α1-AR	Ac-QVAALER••••••••••••••••••••••-NH_2	$C_{150}H_{258}N_{38}O_{47}$	3	1115.640	1115.653
p3α1-AA	Ac-QVAALEA••••••••••••••••••••••-NH_2	$C_{147}H_{251}N_{35}O_{47}$	3	1087.286	1087.284
3α6	Ac-EVEALQKKVAALESKVQALEKKVEALEY-NH_2	$C_{143}H_{242}N_{36}O_{45}$	3	1062.267	1062.260
3α6-KA	Ac-•••••QKKVAALA••••••••••••••-NH_2	$C_{141}H_{240}N_{36}O_{43}$	3	1042.931	1042.933
3α6-AE	Ac-•••••QKAVAALE••••••••••••••-NH_2	$C_{140}H_{235}N_{35}O_{45}$	3	1043.247	1043.241
3α6-AA	Ac-•••••QKAVAALA••••••••••••••-NH_2	$C_{138}H_{233}N_{35}O_{43}$	3	1023.912	1023.914
p3α6	Ac-•••••QKKVAALA••••••••••••••-NH_2	$C_{152}H_{260}N_{36}O_{49}$	3	1125.640	1125.633
p3α6-KA	Ac-•••••QKAVAALE••••••••••••••-NH_2	$C_{150}H_{258}N_{36}O_{47}$	3	1106.305	1106.290
p3α6-AE	Ac-•••••QKAVAALA••••••••••••••-NH_2	$C_{149}H_{253}N_{35}O_{49}$	3	1106.621	1106.620
p3α6-AA	Ac-•••••QKKVAALA••••••••••••••-NH_2	$C_{147}H_{251}N_{35}O_{47}$	3	1087.286	1087.287

Table S3. Sequences, molecular formulas, expected and observed m/z ratios for WW variants.

Name	Sequence	Molecular Formula	z	Expected [M+z·H]/z	Observed [M+z·H]/z
β18	H_2N-KLPPGWEKRMDANGRVYYFNHITNASQFERPSG-OH	$C_{173}H_{257}N_{51}O_{49}S$	4	967.231	967.226
β18-DA	H_2N-••••••••••DANGA••••••••••••••••-OH	$C_{170}H_{250}N_{48}O_{49}S$	4	945.965	945.948
β18-SR	H_2N-••••••••••SANGR••••••••••••••••-OH	$C_{172}H_{257}N_{51}O_{48}S$	3	1279.973	1279.973
β18-SA	H_2N-••••••••••SANGA••••••••••••••••-OH	$C_{169}H_{250}N_{48}O_{48}S$	3	1251.619	1251.607
pβ18	H_2N-••••••••••DANGR••••••••••••••••-OH	$C_{182}H_{275}N_{51}O_{53}S$	4	1014.761	1014.747
pβ18-DA	H_2N-••••••••••DANGA••••••••••••••••-OH	$C_{179}H_{268}N_{48}O_{53}S$	4	993.495	993.483
pβ18-SR	H_2N-••••••••••SANGR••••••••••••••••-OH	$C_{181}H_{275}N_{51}O_{52}S$	4	1007.762	1007.751
pβ18-SA	H_2N-••••••••••SANGA••••••••••••••••-OH	$C_{178}H_{268}N_{48}O_{52}S$	4	986.496	986.482
β23	H_2N-KLPPGWEKRMSRSSGRVXYFNHITNASQFERPSG-OH	---	---	---	---
β23-EA	H_2N-••••••EKAMSRSSGRVX••••••••••••••-OH	$C_{177}H_{263}N_{51}O_{50}S$	4	984.741	984.735
β23-AR	H_2N-••••••AKRMSRSSGRVX••••••••••••••-OH	$C_{178}H_{268}N_{54}O_{48}S$	4	991.506	991.503
β23-AA	H_2N-••••••AKAMSRSSGRVX••••••••••••••-OH	$C_{175}H_{261}N_{51}O_{48}S$	4	970.240	970.232
pβ23	H_2N-••••••EKRMSRSSGRVX••••••••••••••-OH	---	---	---	---
pβ23-EA	H_2N-••••••EKAMSRSSGRVX••••••••••••••-OH	$C_{186}H_{282}N_{54}O_{54}S$	4	1043.026	1043.020
pβ23-AR	H_2N-••••••AKRMSRSSGRVX••••••••••••••-OH	$C_{187}H_{287}N_{57}O_{52}S$	4	1049.790	1049.787
pβ23-AA	H_2N-••••••AKAMSRSSGRVX••••••••••••••-OH	$C_{184}H_{280}N_{54}O_{52}S$	4	1028.524	1028.517

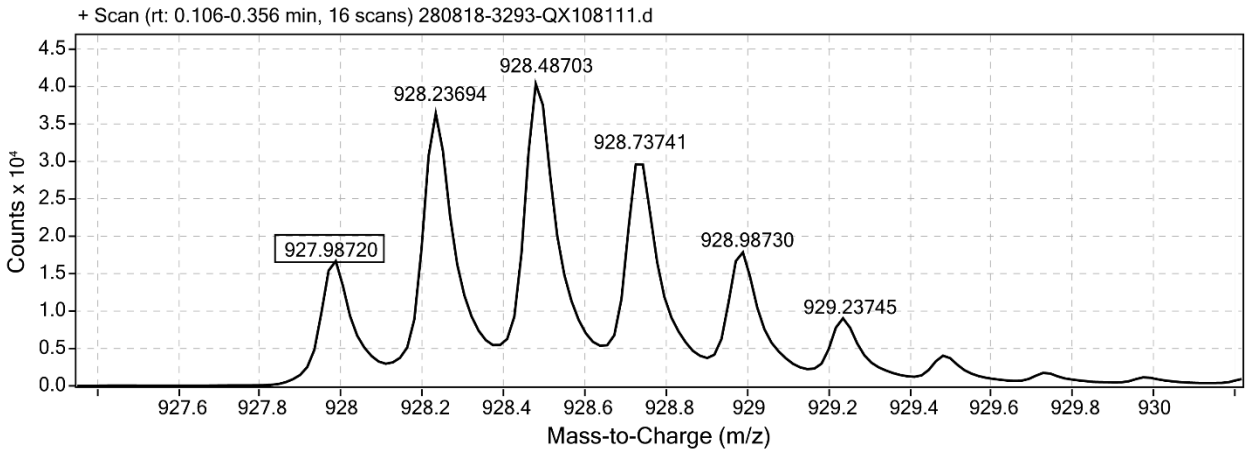


Figure S1. ESI-TOF MS data for **2α1** (QX108111). Expected $[M+4H^+]/4 = 928.009$.

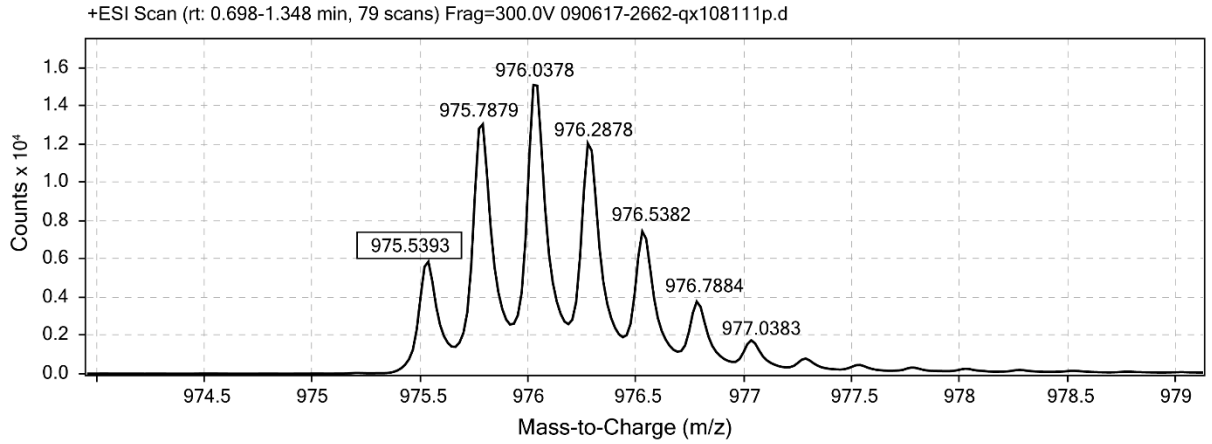


Figure S2. ESI-TOF MS data for **p2α1** (QX108111p). Expected $[M+4H^+]/4 = 975.539$.

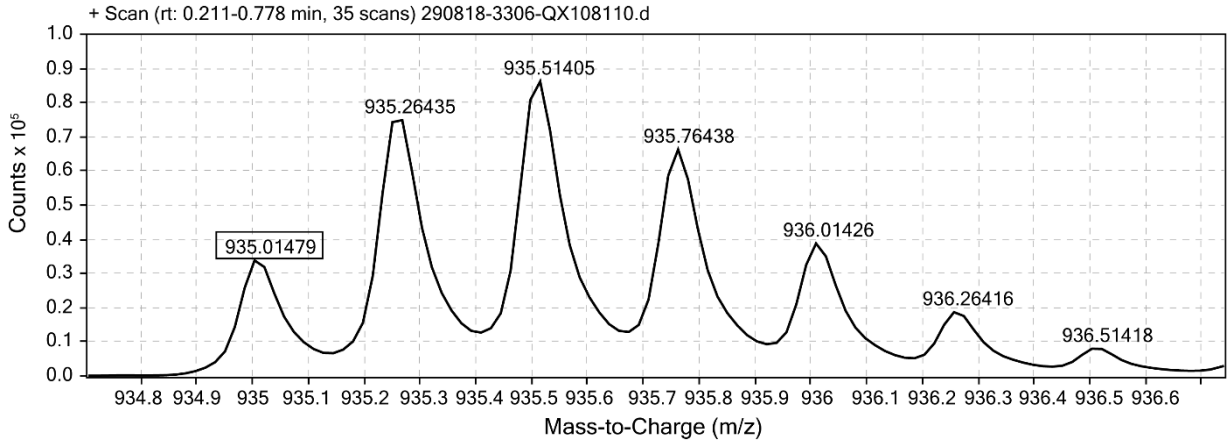


Figure S3. ESI-TOF MS data for **2α3** (QX108110). Expected $[M+4H^+]/4 = 935.010$.

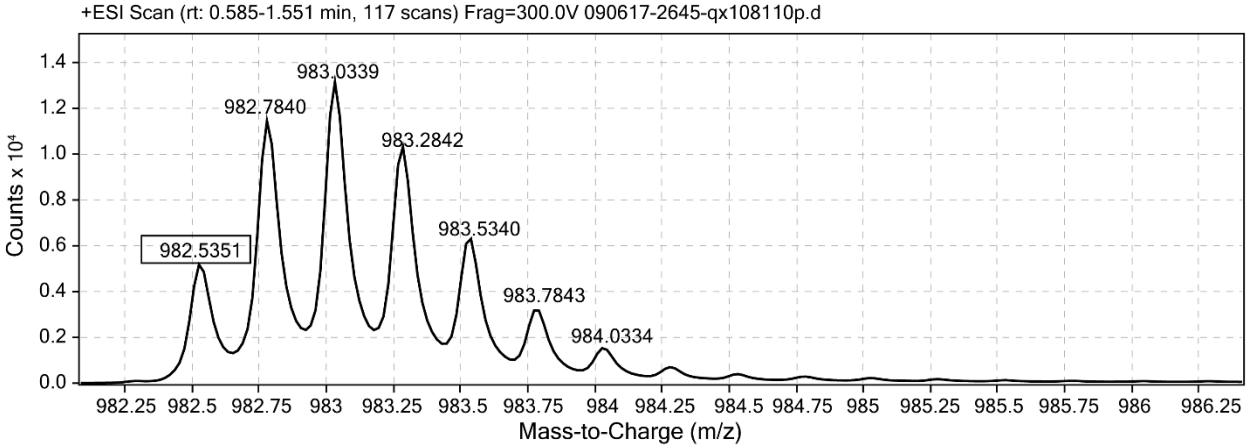


Figure S4. ESI-TOF MS data for **p2α3** (QX108110p). Expected $[M+4H^+]/4 = 982.541$.

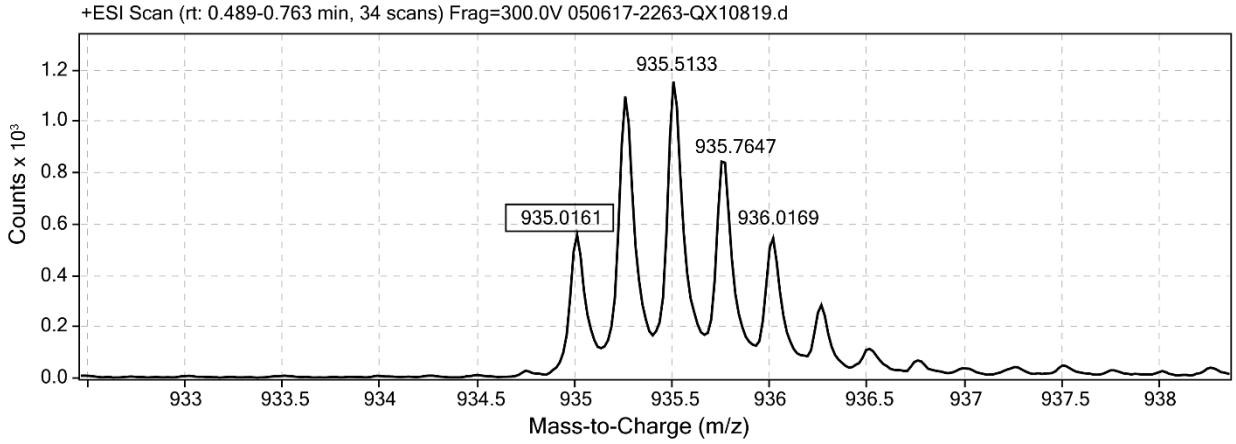


Figure S5. ESI-TOF MS data for **2α4** (QX10819). Expected $[M+4H^+]/4 = 935.020$.

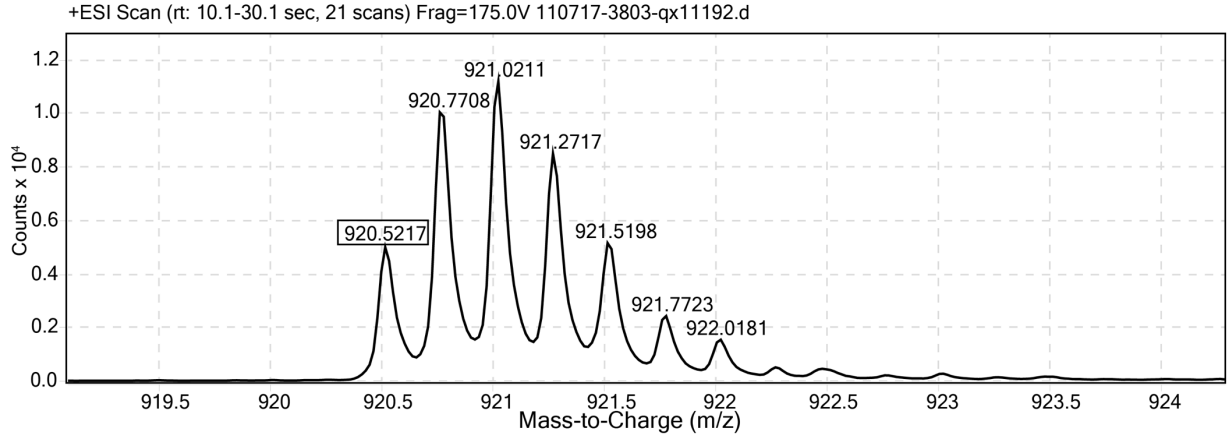


Figure S6. ESI-TOF MS data for **2α4-KA** (QX11192). Expected $[M+4H^+]/4 = 920.518$.

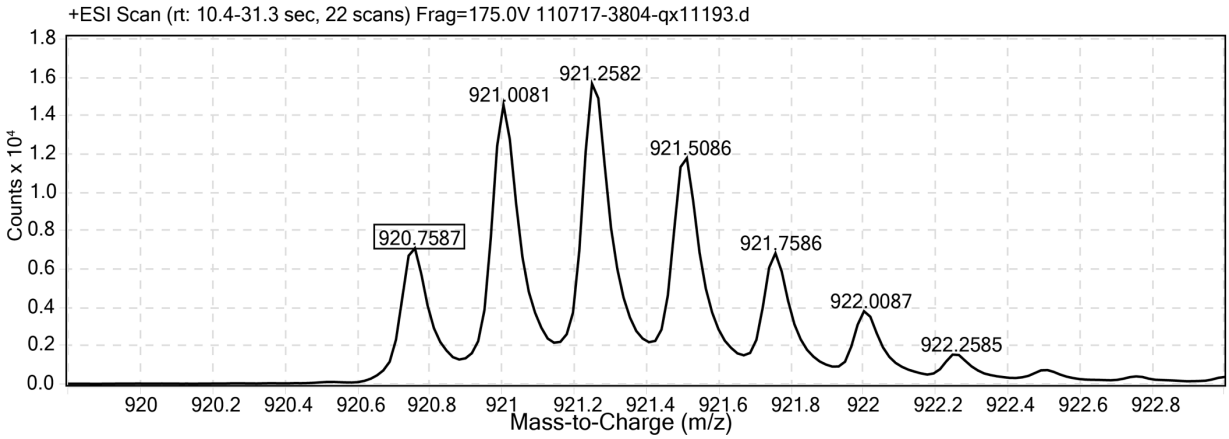


Figure S7. ESI-TOF MS data for **2α4-AE** (QX11193). Expected $[M+4H^+]/4 = 920.755$.

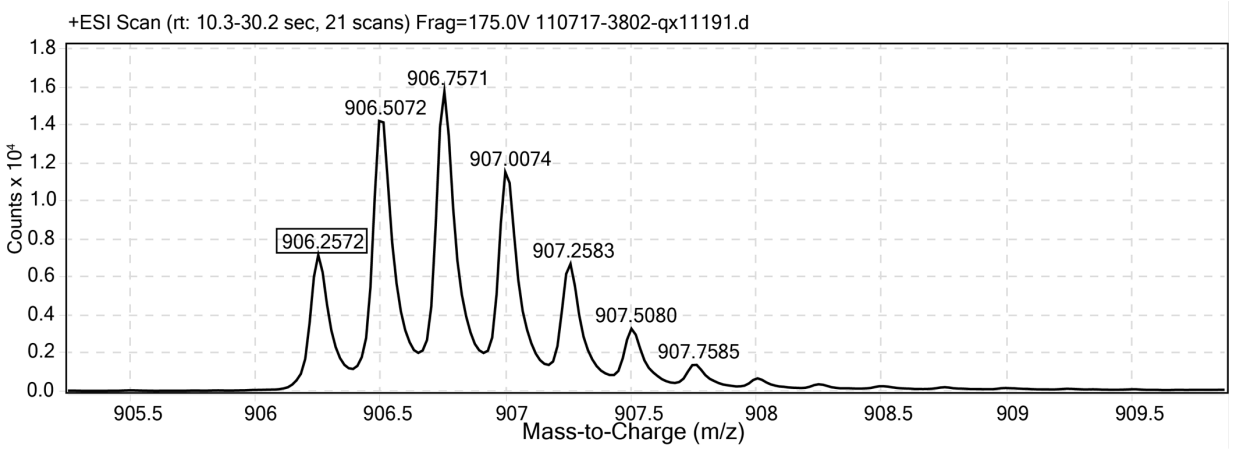


Figure S8. ESI-TOF MS data for **2α4-AA** (QX11191). Expected $[M+4H^+]/4 = 906.254$.

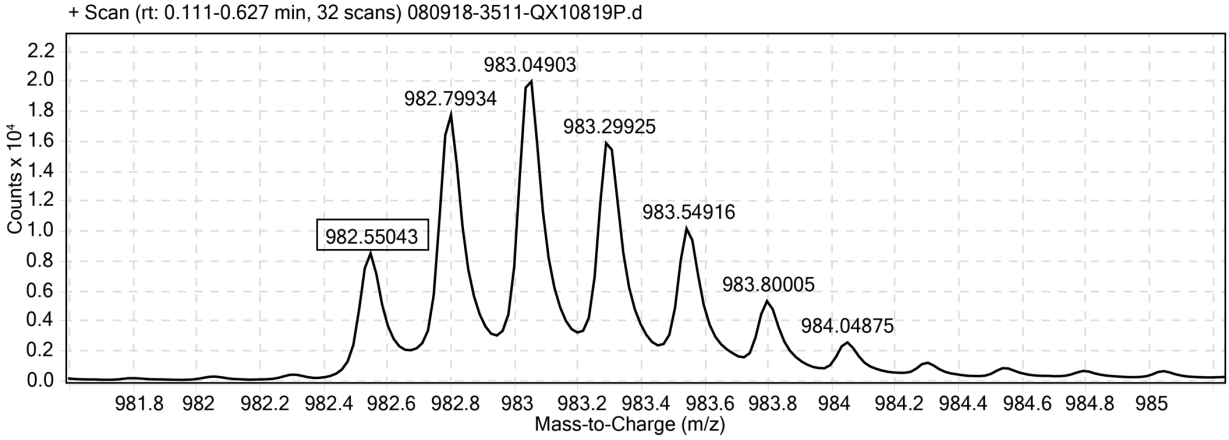


Figure S9. ESI-TOF MS data for **p2α4** (QX10819p). Expected $[M+4H^+]/4 = 982.550$.

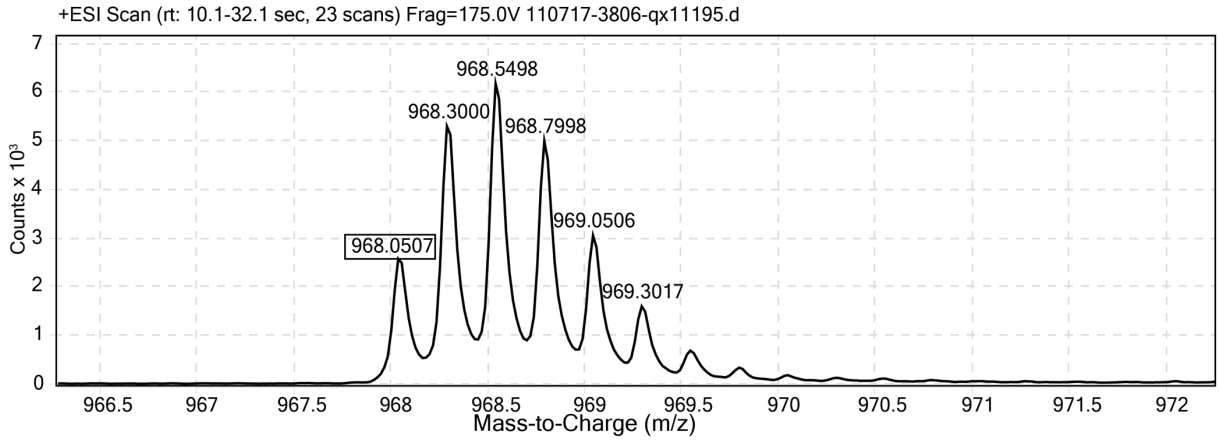


Figure S10. ESI-TOF MS data for **p2α4-KA** (QX11195). Expected $[M+4H^+]/4 = 968.051$.

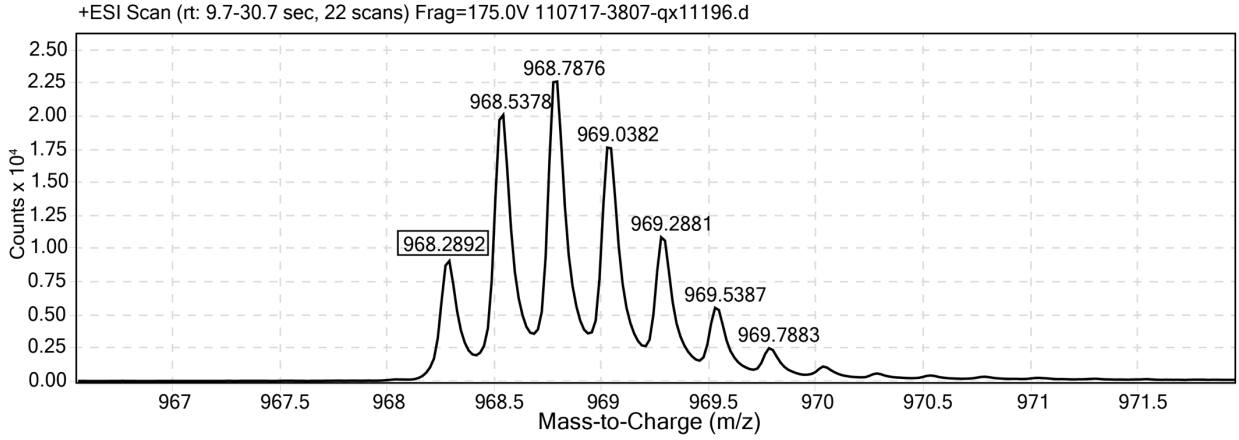


Figure S11. ESI-TOF MS data for **p2α4-AE** (QX11196). Expected $[M+4H^+]/4 = 968.285$.

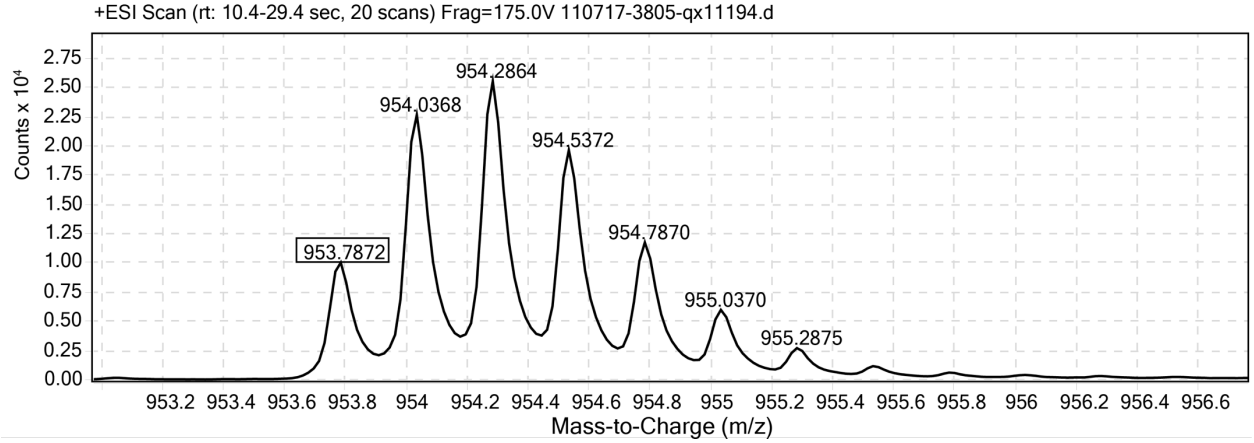


Figure S12. ESI-TOF MS data for **p2α4-AA** (QX11194). Expected $[M+4H^+]/4 = 953.787$.

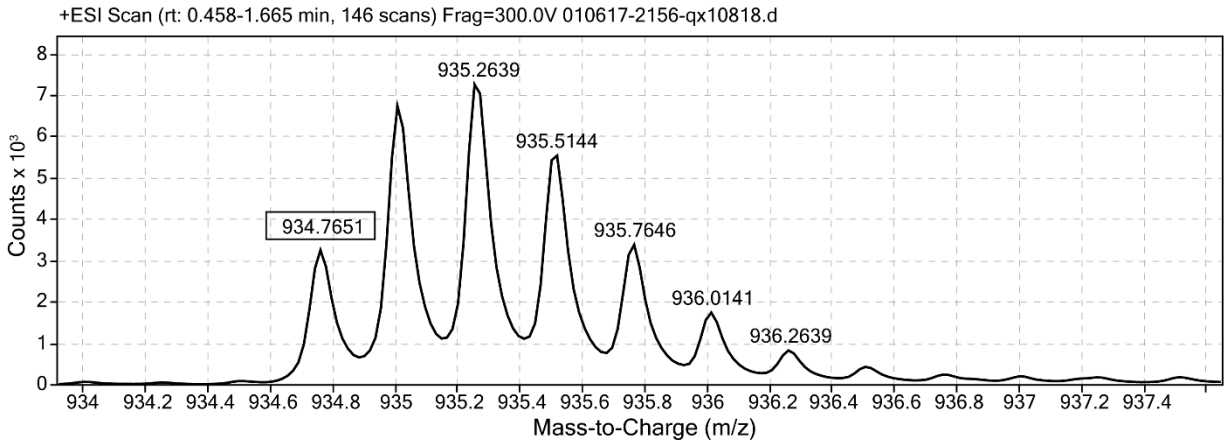


Figure S13. ESI-TOF MS data for **2α6** (QX10818). Expected [M+4H$^+$]/4 = 934.774.

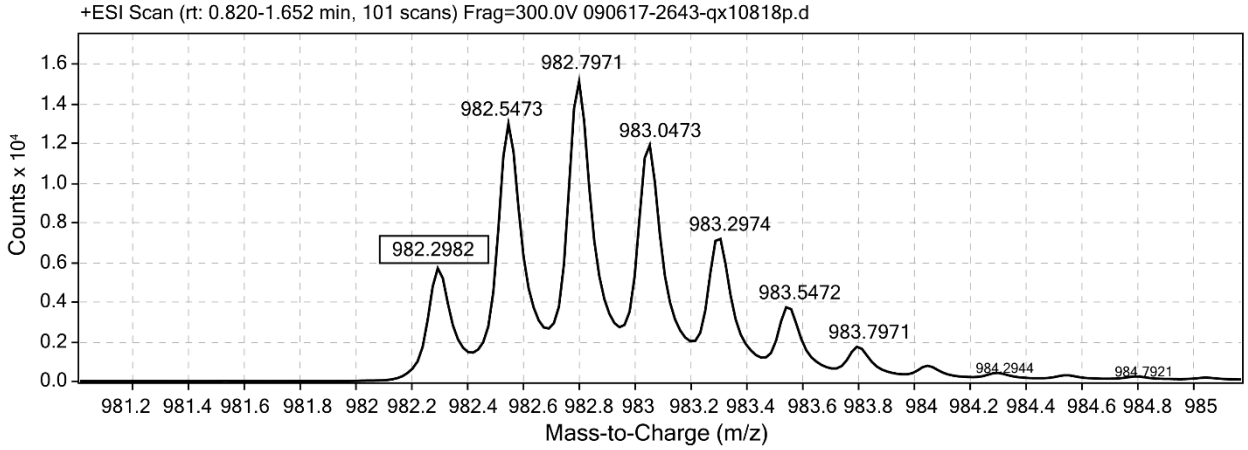


Figure S14. ESI-TOF MS data for **p2α6** (QX10818p). Expected [M+4H$^+$]/4 = 982.304.

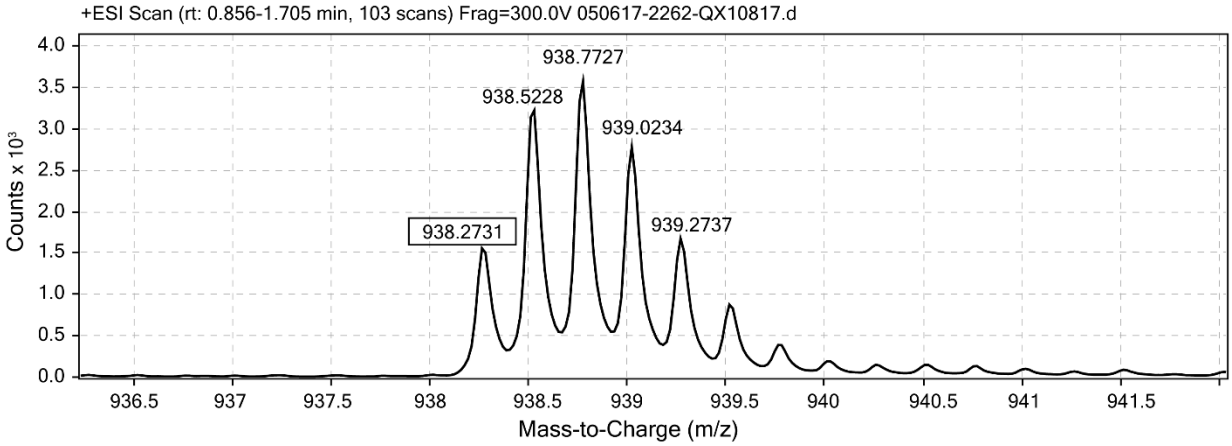


Figure S15. ESI-TOF MS data for **2α7** (QX10817). Expected [M+4H$^+$]/4 = 938.277.

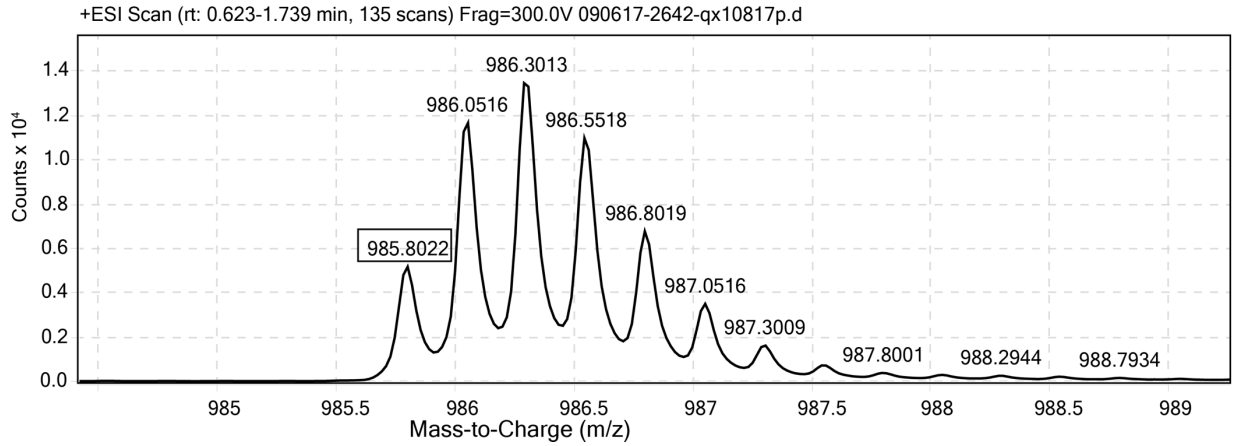


Figure S16. ESI-TOF MS data for **p2α7** (QX10817p). Expected $[M+4H^+]/4$ = 985.808.

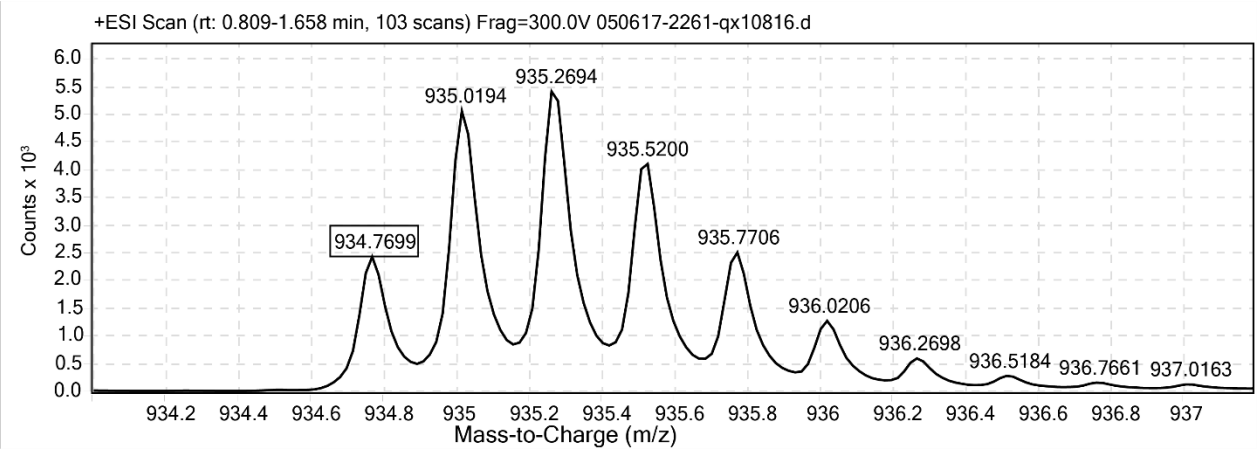


Figure S17. ESI-TOF MS data for **2α10** (QX10816). Expected $[M+4H^+]/4$ = 934.774.

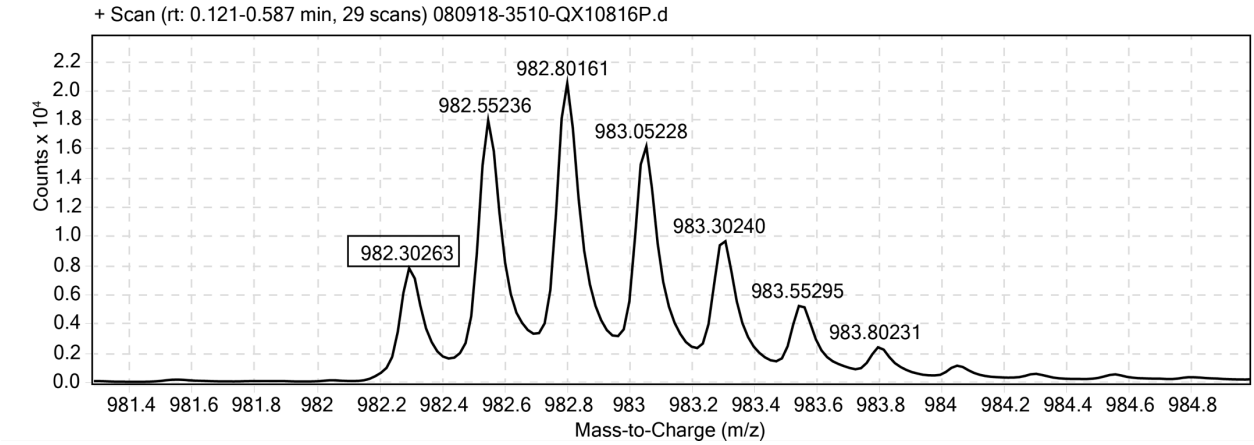


Figure S18. ESI-TOF MS data for **p2α10** (QX10816p). Expected $[M+4H^+]/4$ = 982.304.

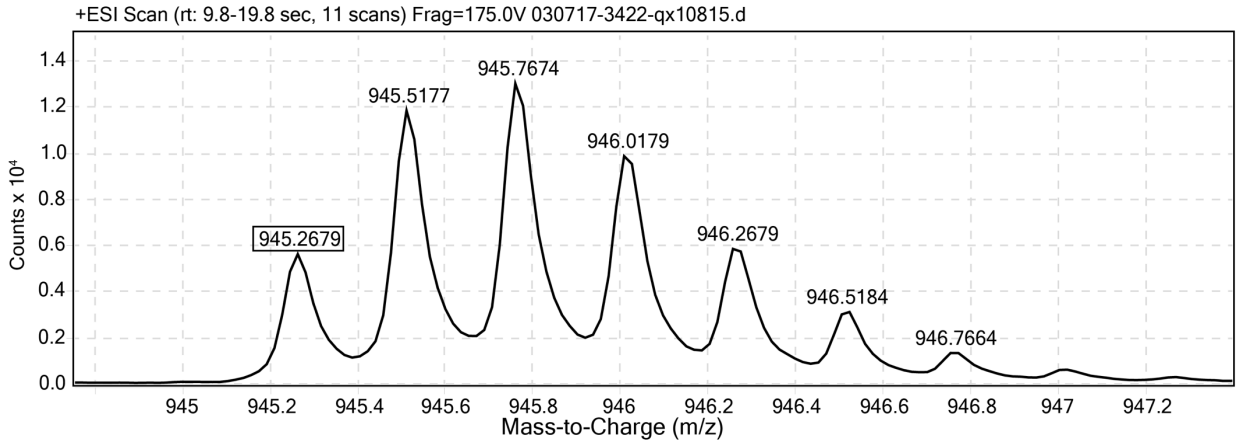


Figure S19. ESI-TOF MS data for **2α14** (QX10815). Expected $[M+4H^+]/4 = 945.276$.

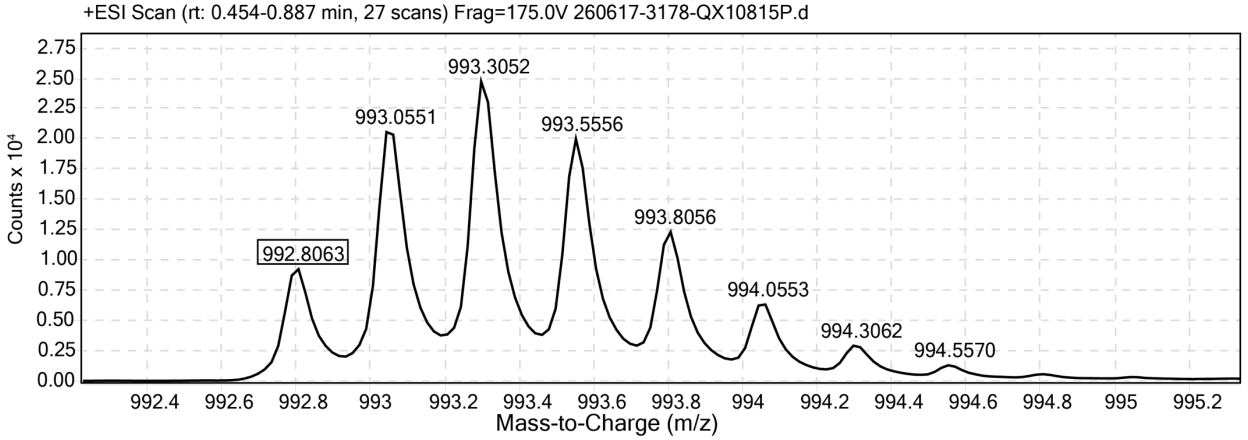


Figure S20. ESI-TOF MS data for **p2α14** (QX10815p). Expected $[M+4H^+]/4 = 992.806$.

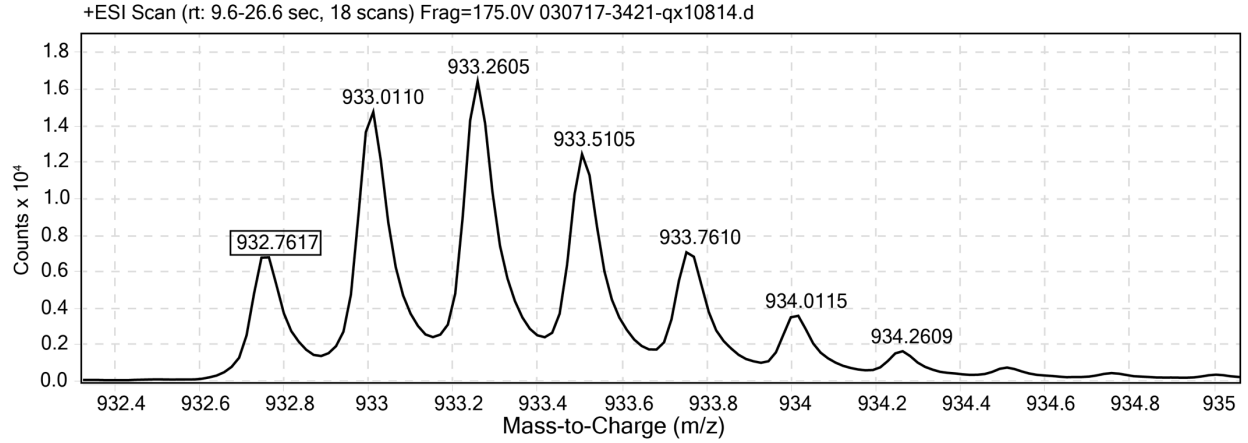


Figure S21. ESI-TOF MS data for **2α18** (QX10814). Expected $[M+4H^+]/4 = 932.769$.

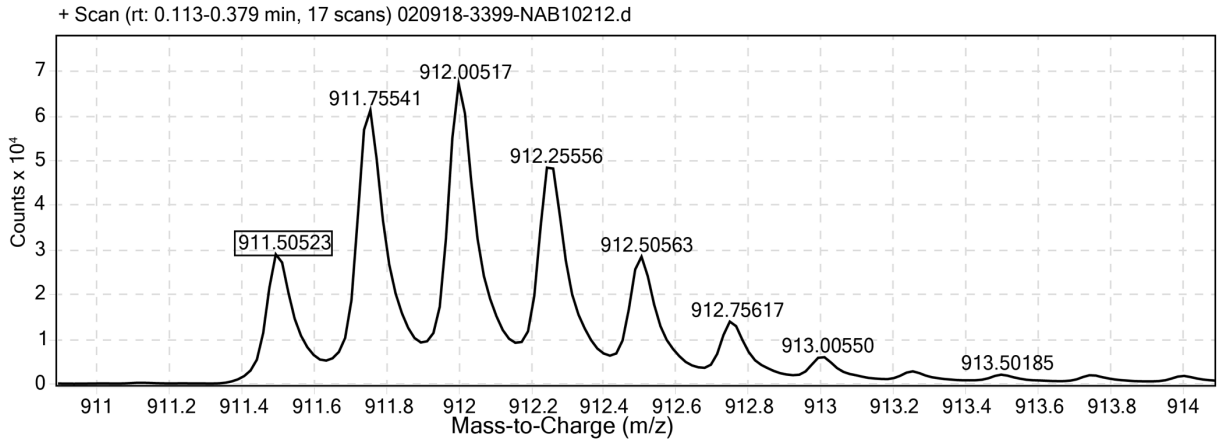


Figure S22. ESI-TOF MS data for **2α18-EA** (NAB10212). Expected $[M+4H^+]/4 = 911.503$.

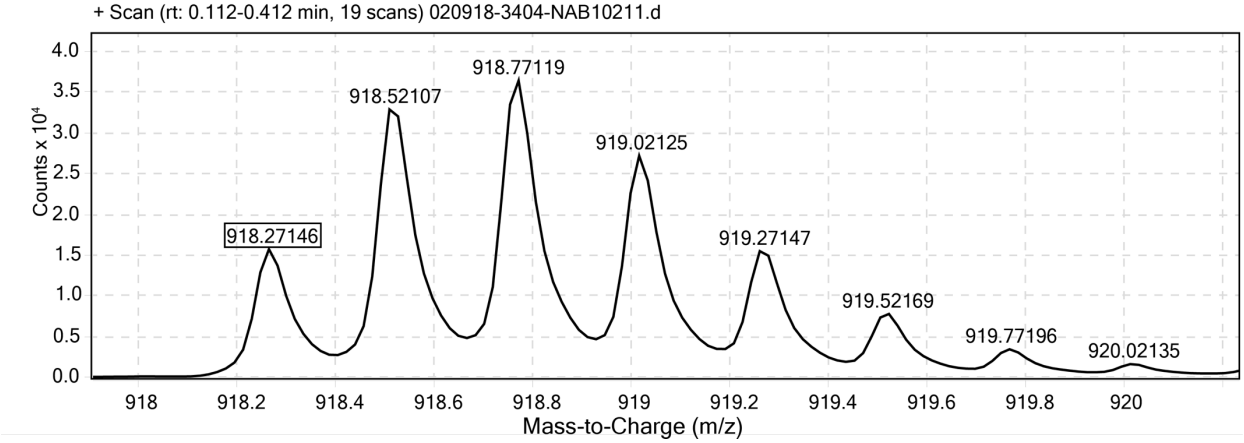


Figure S23. ESI-TOF MS data for **2α18-AR** (NAB10211). Expected $[M+4H^+]/4 = 918.268$.

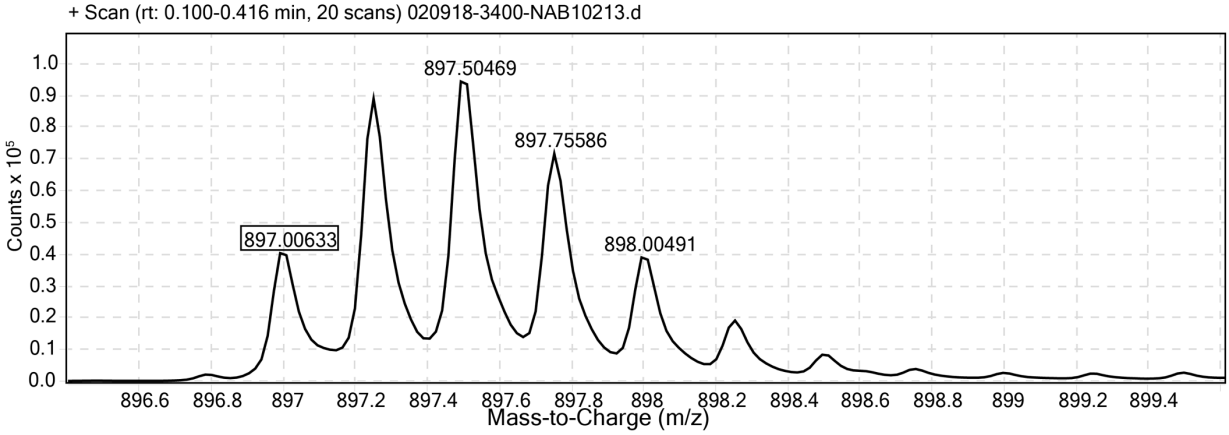


Figure S24. ESI-TOF MS data for **2α18-AA** (NAB10213). Expected $[M+4H^+]/4 = 897.002$.

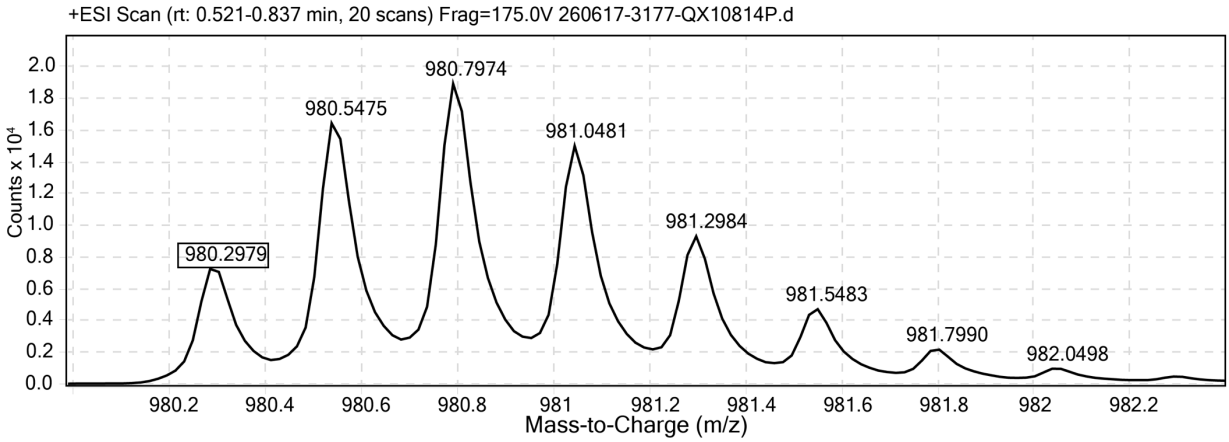


Figure S25. ESI-TOF MS data for **p2α18** (QX10814p). Expected $[M+4H^+]/4$ = 980.300.

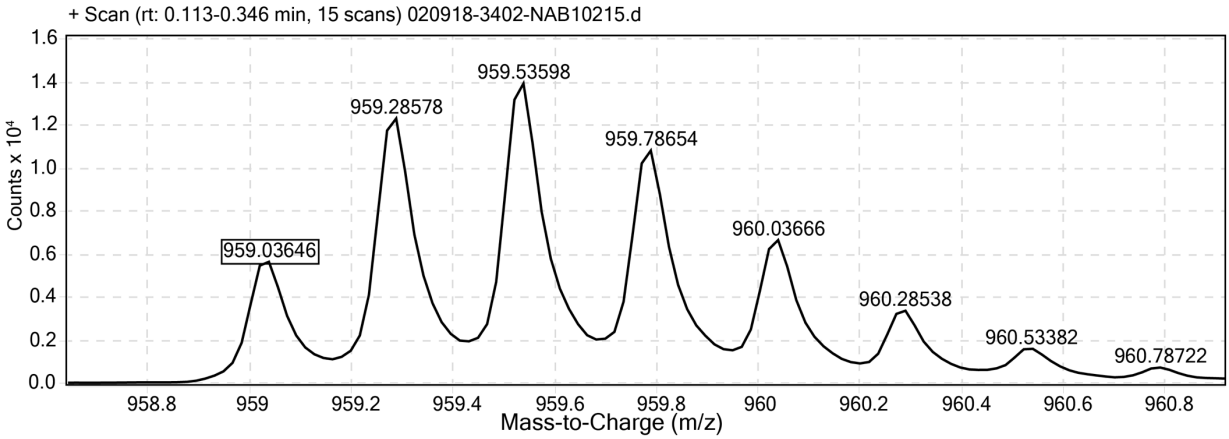


Figure S26. ESI-TOF MS data for **p2α18-EA** (NAB10215). Expected $[M+4H^+]/4$ = 959.034.

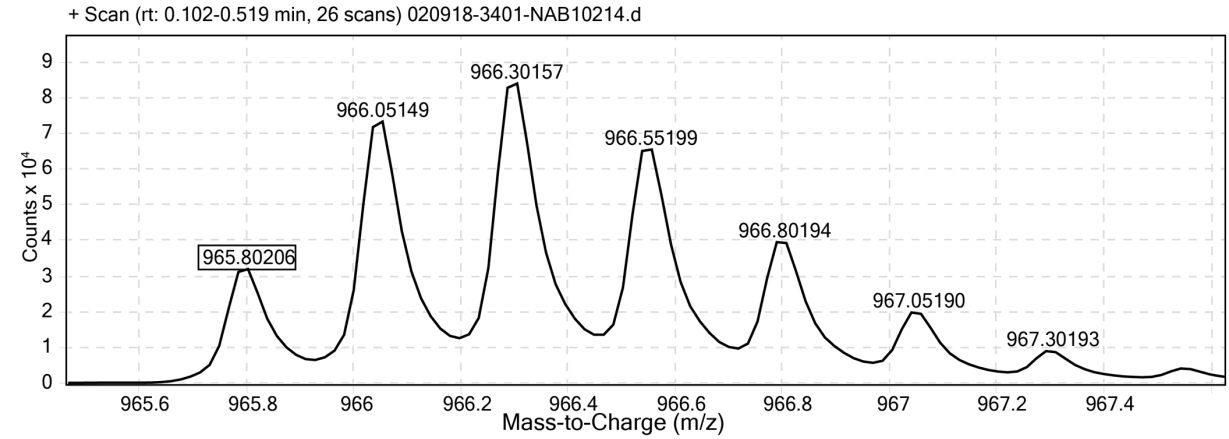


Figure S27. ESI-TOF MS data for **p2α18-AR** (NAB10214). Expected $[M+4H^+]/4$ = 965.798.

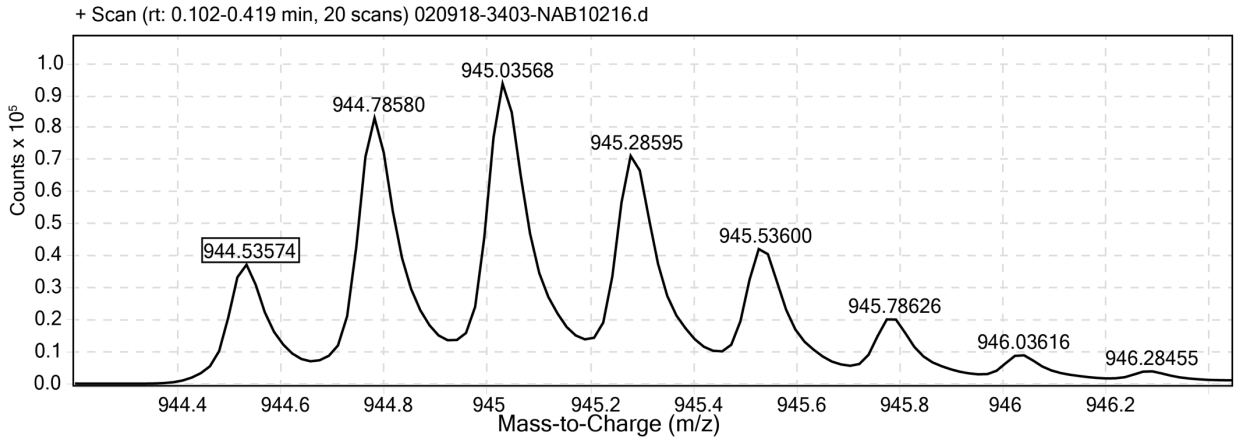


Figure S28. ESI-TOF MS data for **p2α18-AA** (NAB10216). Expected $[M+4H^+]/4 = 944.532$.

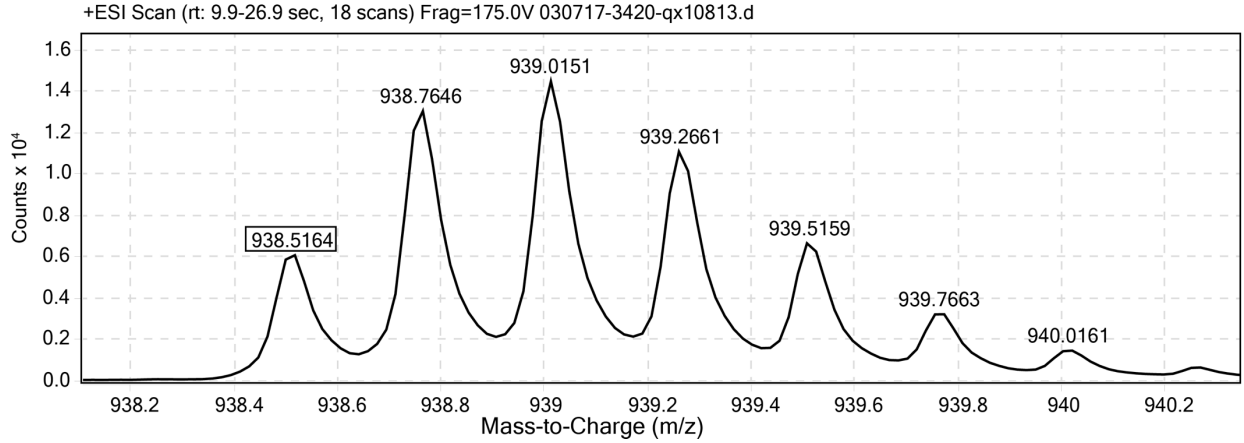


Figure S29. ESI-TOF MS data for **2α21** (QX10813). Expected $[M+4H^+]/4 = 938.523$.

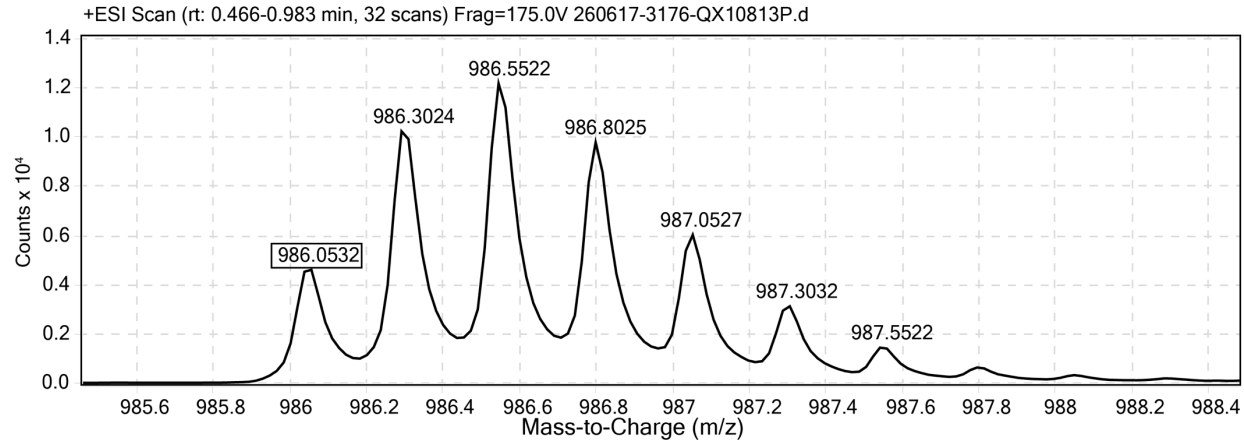


Figure S30. ESI-TOF MS data for **p2α21** (QX10813p). Expected $[M+4H^+]/4 = 986.054$.

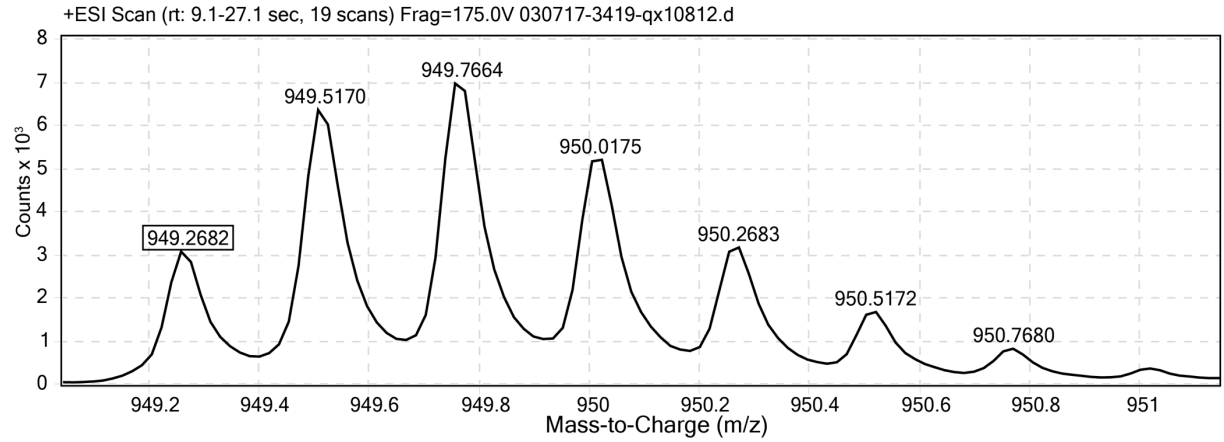


Figure S31. ESI-TOF MS data for **2α25** (QX10812). Expected $[M+4H^+]/4 = 949.275$.

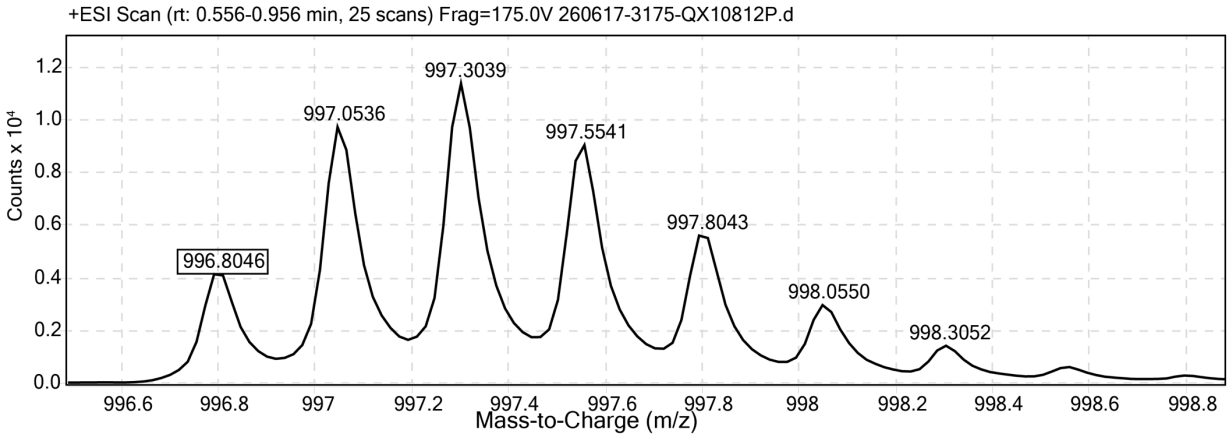


Figure S32. ESI-TOF MS data for **p2α25** (QX10812p). Expected $[M+4H^+]/4 = 996.805$.

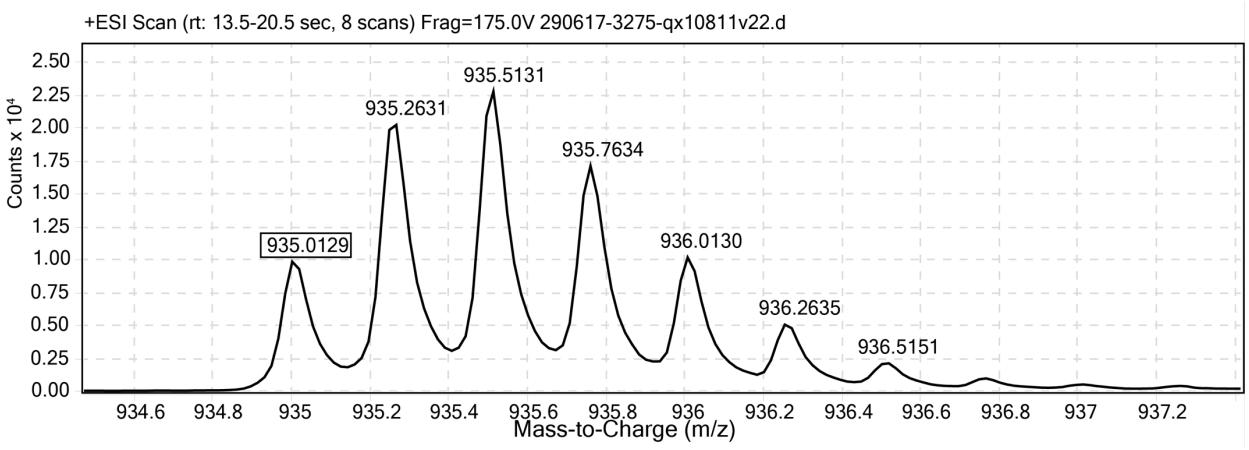


Figure S33. ESI-TOF MS data for **2α28** (QX10811). Expected $[M+4H^+]/4 = 935.010$.

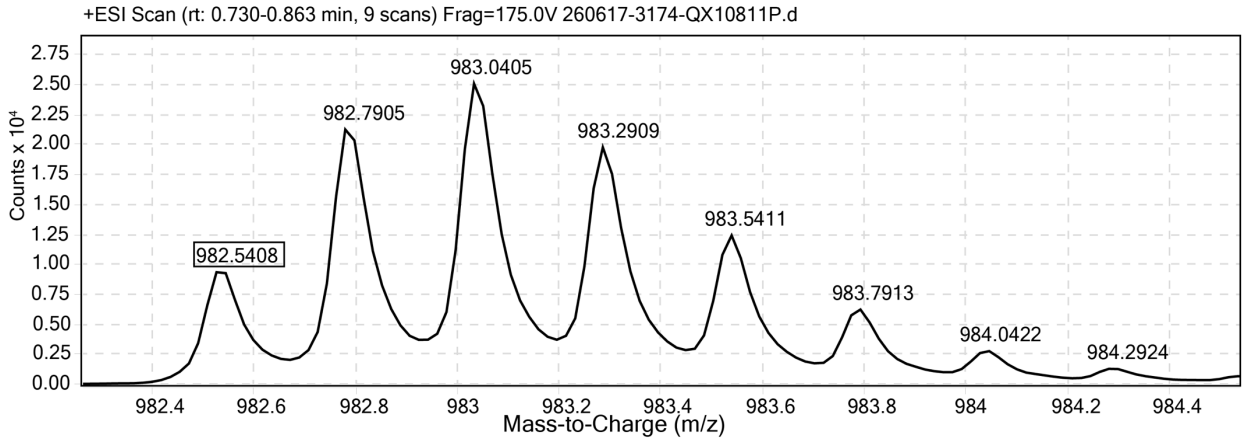


Figure S34. ESI-TOF MS data for **p2α28** (QX10811p). Expected $[M+4H^+]/4$ = 982.541.

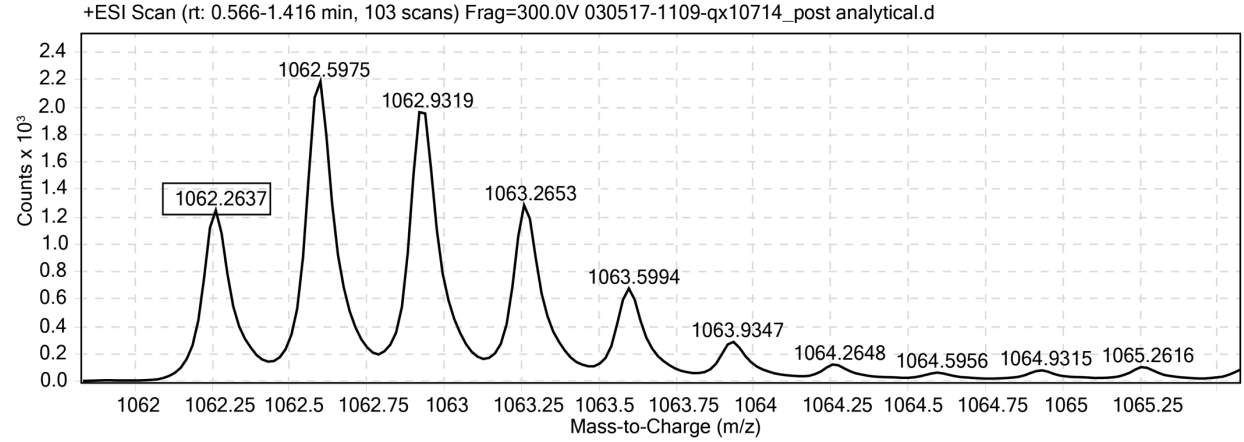


Figure S35. ESI-TOF MS data for **3α1** (QX10714). Expected $[M+3H^+]/3$ = 1062.267.

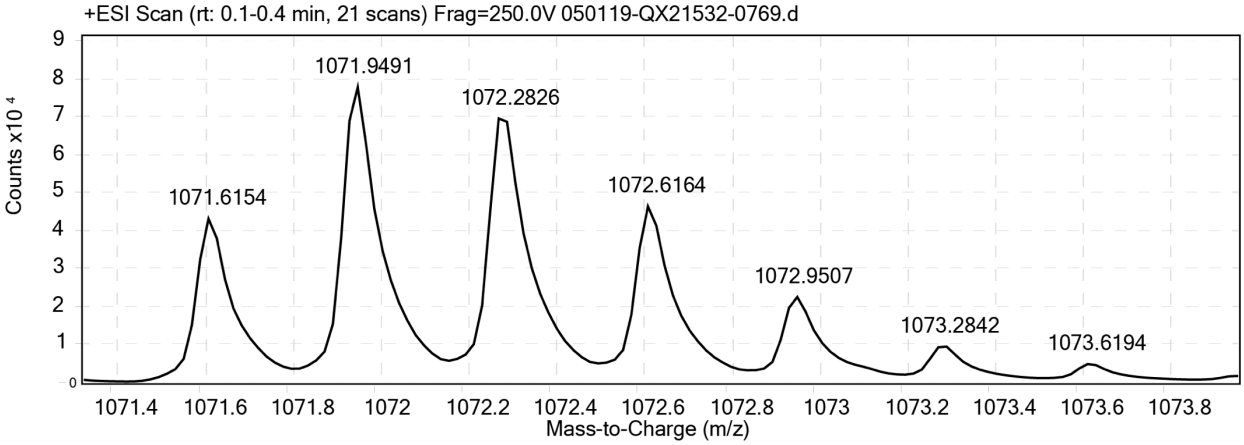


Figure S36. ESI-TOF MS data for **3α1-ER** (QX21532). Expected $[M+3H^+]/3$ =1071.602.

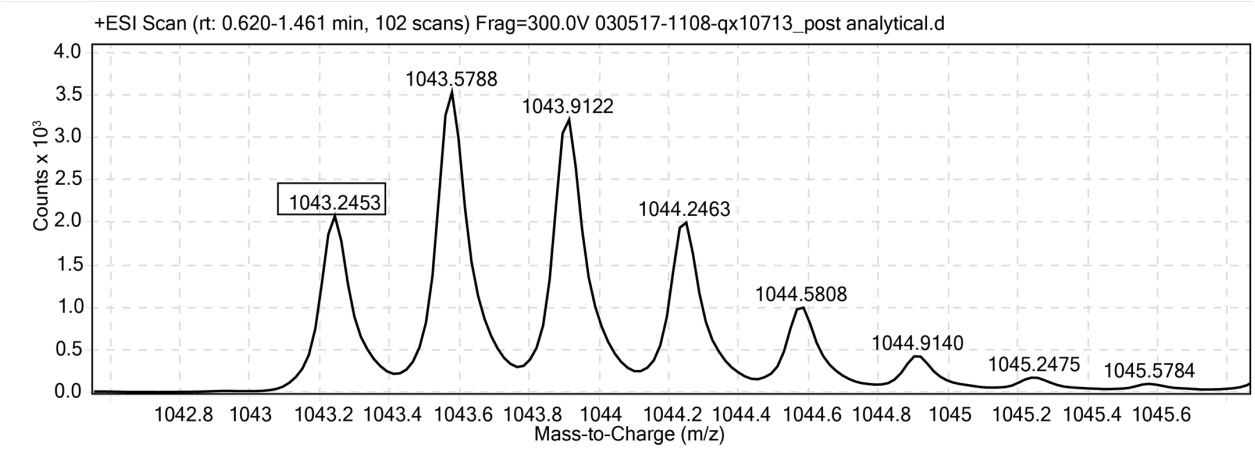


Figure S37. ESI-TOF MS data for **3α1-EA** (QX10713). Expected $[M+3H^+]/3$ = 1043.247.

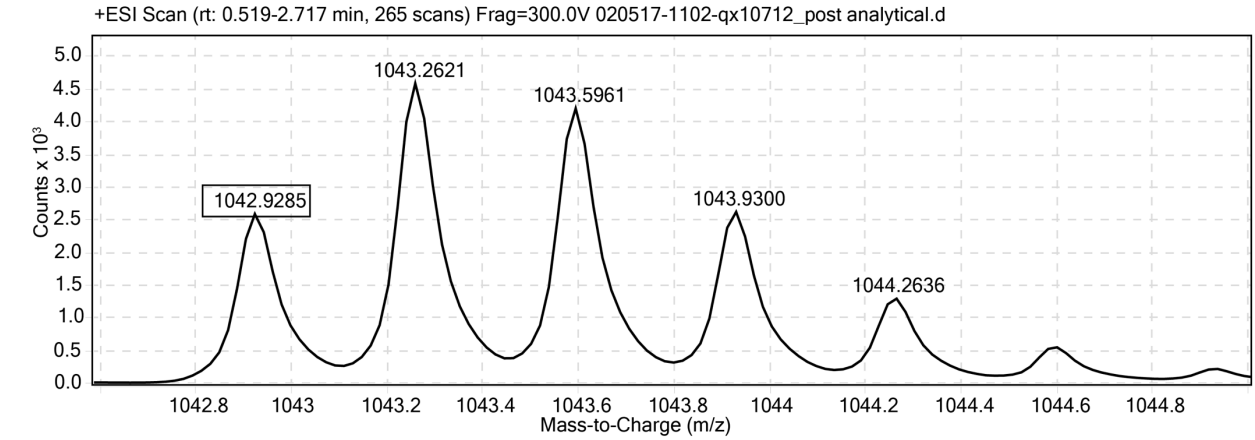


Figure S38. ESI-TOF MS data for **3α1-AK** (QX10712). Expected $[M+3H^+]/3$ = 1042.931.

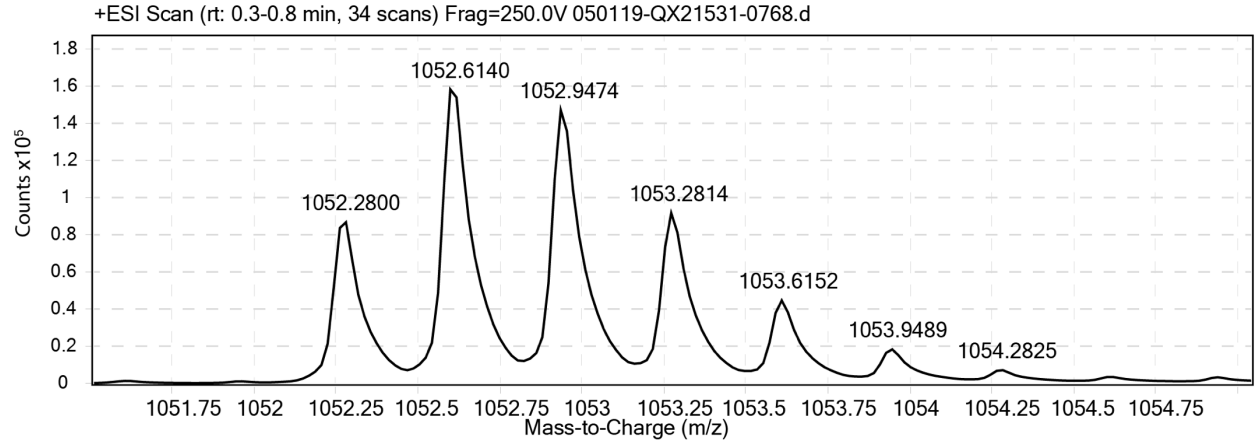


Figure S39. ESI-TOF MS data for **3α1-AR** (QX21531). Expected $[M+3H^+]/3$ =1052.267.

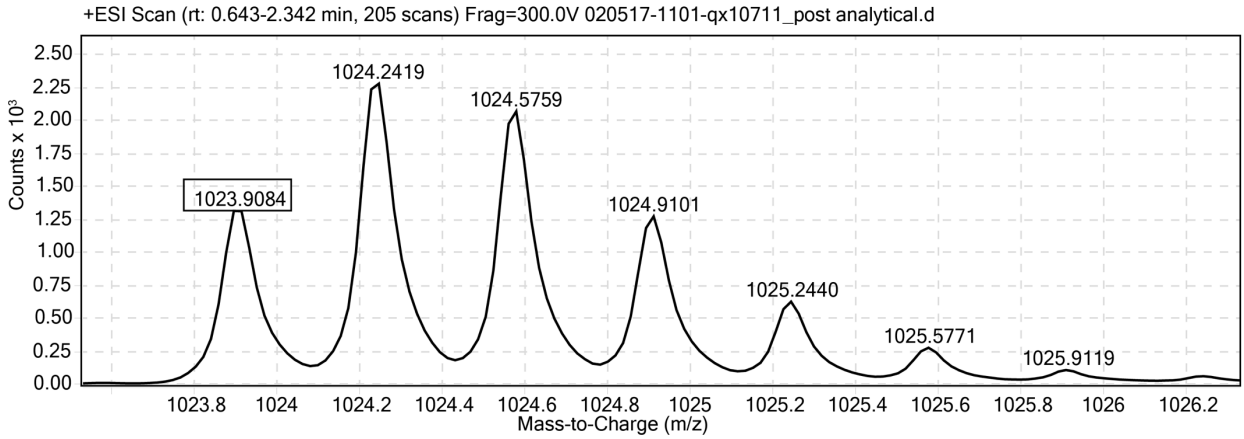


Figure S40. ESI-TOF MS data for **3α1-AA** (QX10711). Expected [M+3H$^+$]/3 = 1023.912.

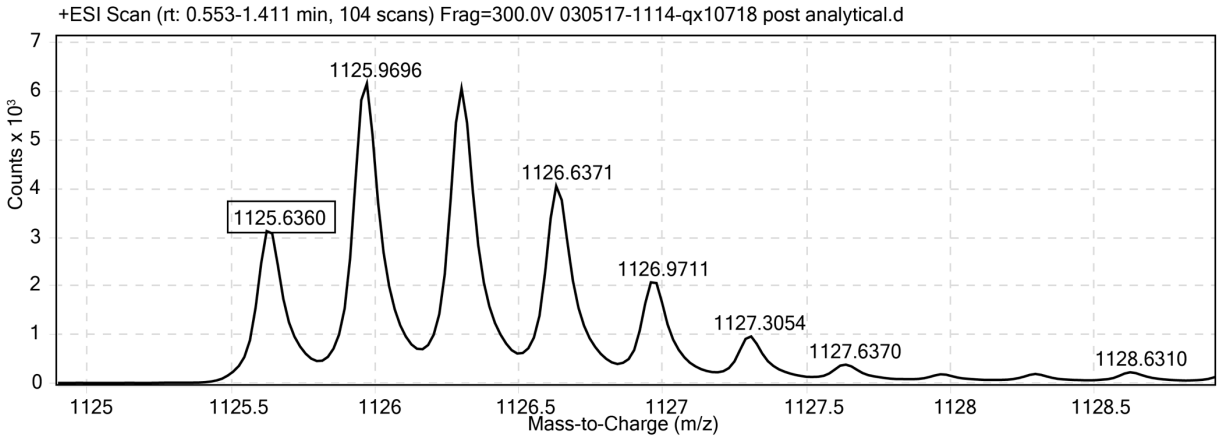


Figure S41. ESI-TOF MS data for **p3α1** (QX10718). Expected [M+3H$^+$]/3 = 1125.640.

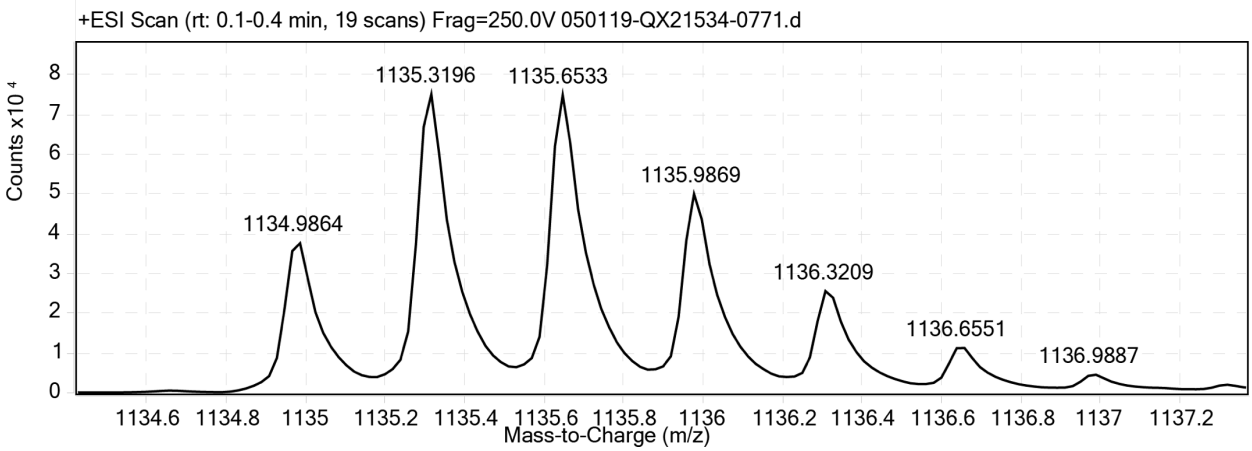


Figure S42. ESI-TOF MS data for **p3α1-ER** (QX21534). Expected [M+3H$^+$]/3 =1134.976.

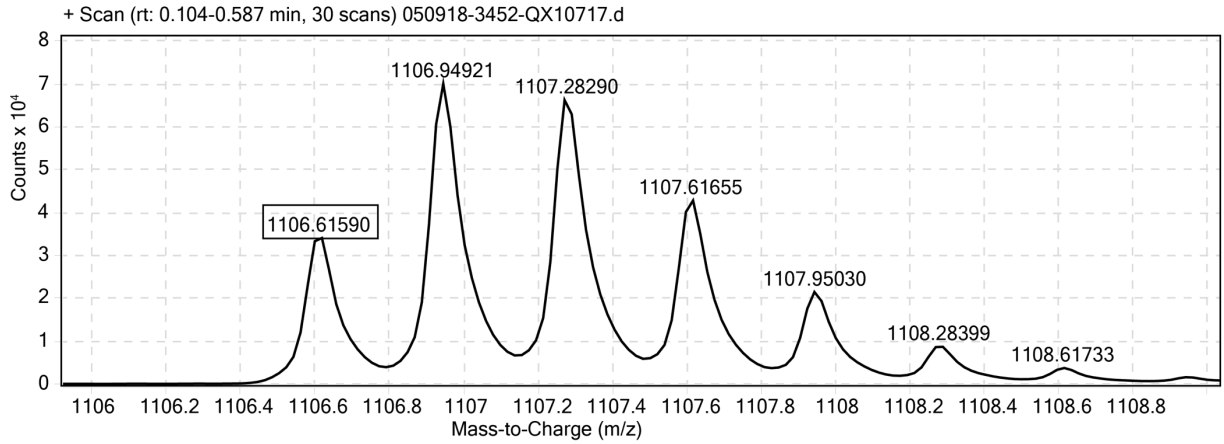


Figure S43. ESI-TOF MS data for **p3α1-EA** (QX10717). Expected $[M+3H^+]/3$ = 1106.621.

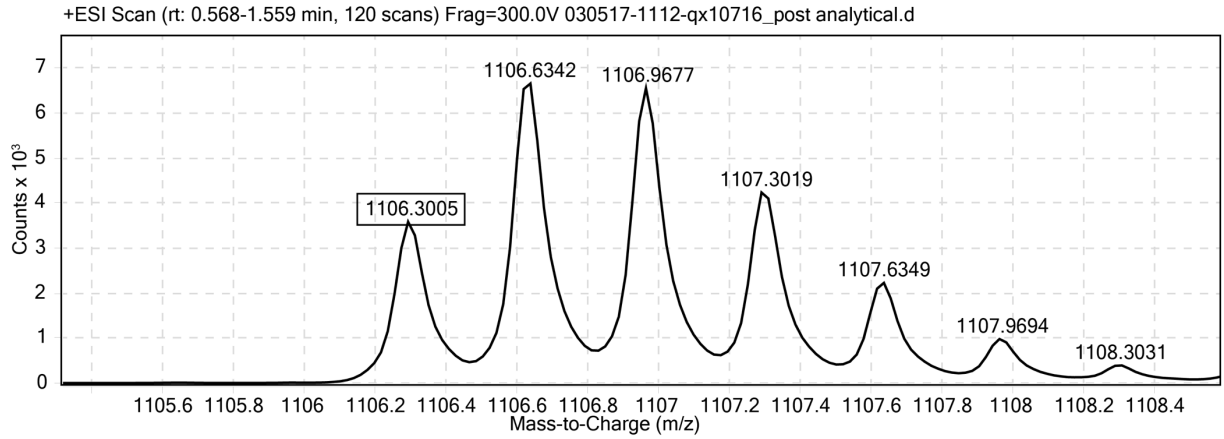


Figure S44. ESI-TOF MS data for **p3α1-AK** (QX10716). Expected $[M+3H^+]/3$ = 1106.305.

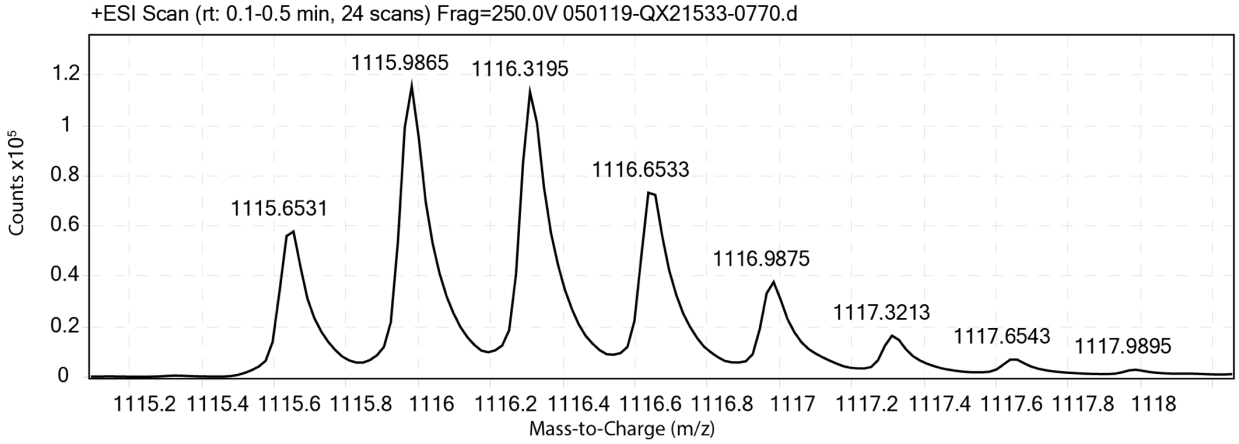


Figure S45. ESI-TOF MS data for **p3α1-AR** (QX21533). Expected $[M+3H^+]/3$ =1115.640.

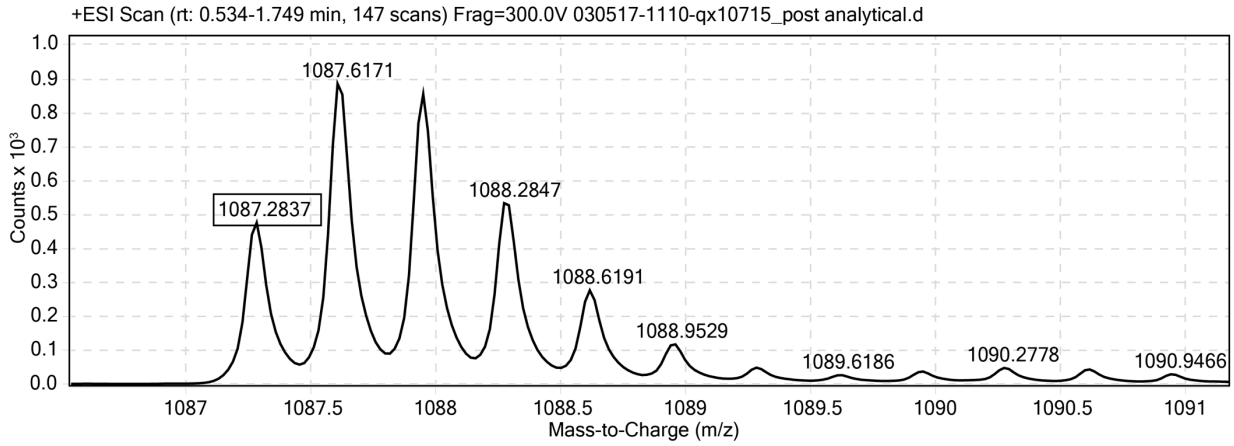


Figure S46. ESI-TOF MS data for **p3α1-AA** (QX10715). Expected $[M+3H^+]/3$ = 1087.286.

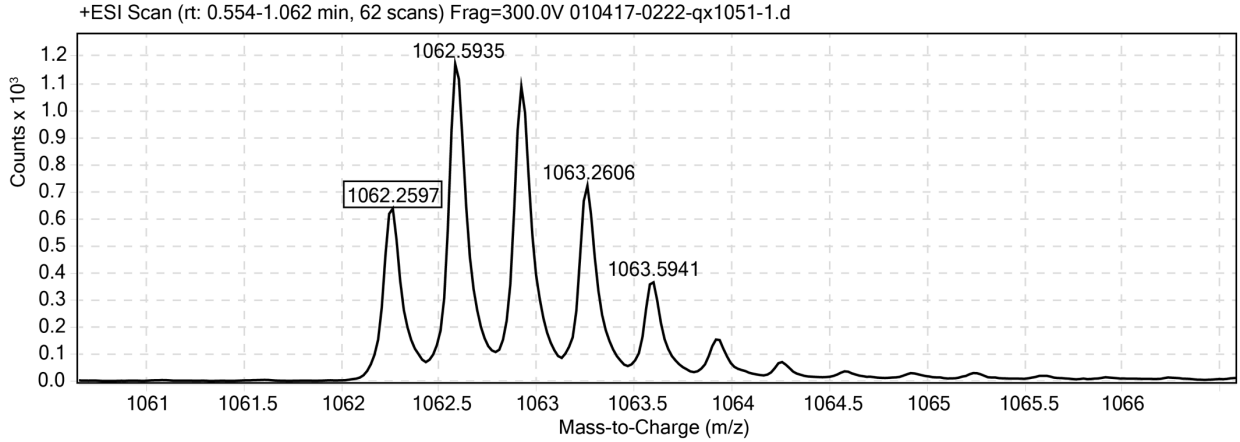


Figure S47. ESI-TOF MS data for **3α6** (QX10511). Expected $[M+3H^+]/3$ = 1062.267.

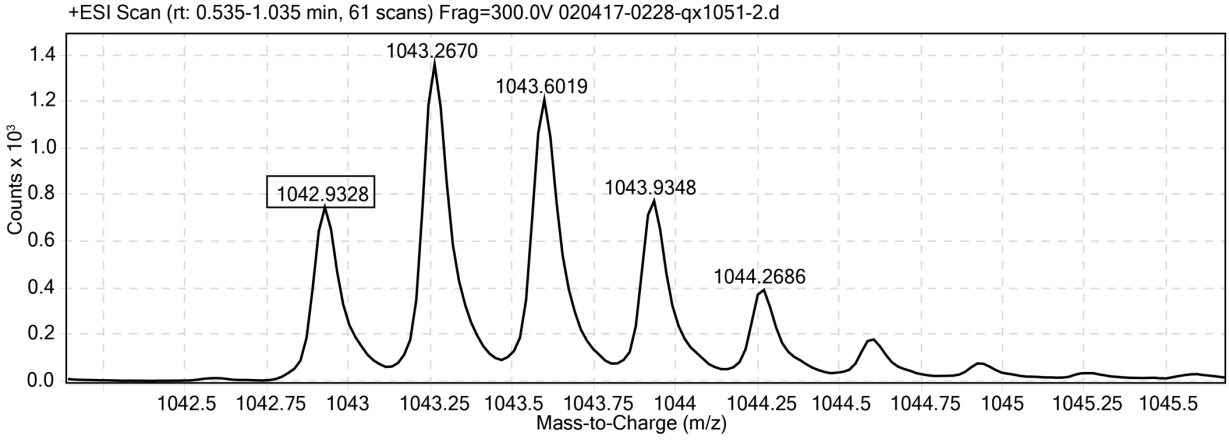


Figure S48. ESI-TOF MS data for **3α6-KA** (QX10512). Expected $[M+3H^+]/3$ = 1042.931.

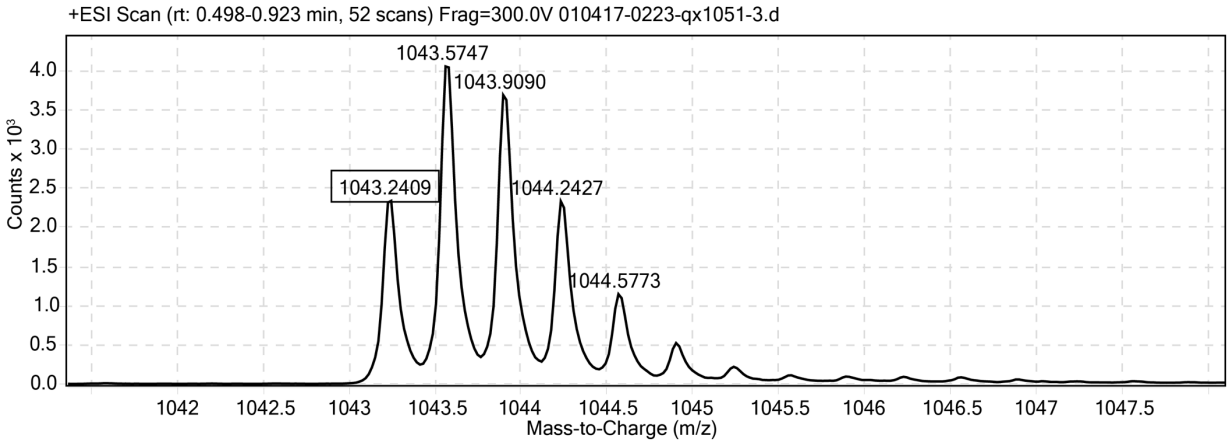


Figure S49. ESI-TOF MS data for **3α6-AE** (QX10513). Expected [M+3H$^+$]/3 = 1043.247.

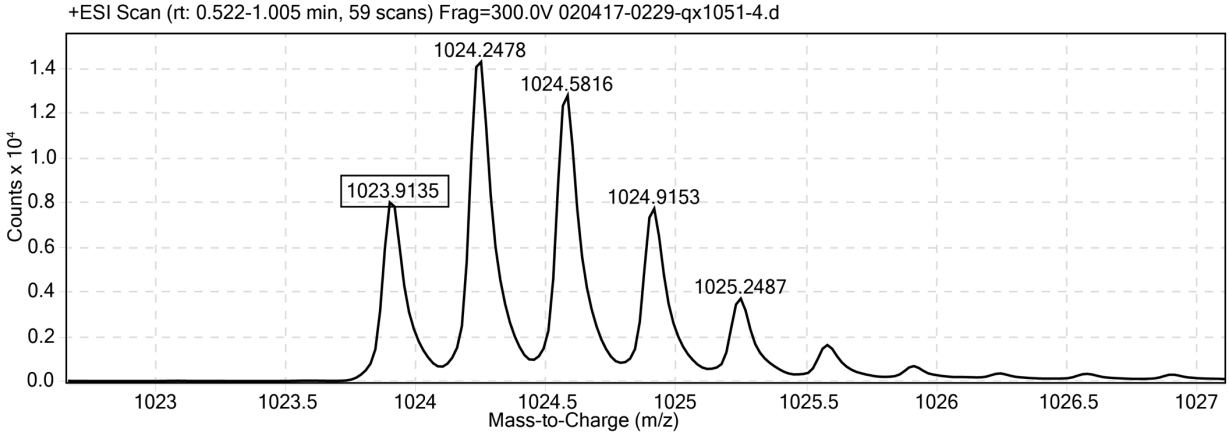


Figure S50. ESI-TOF MS data for **3α6-AA** (QX10514). Expected [M+3H$^+$]/3 = 1023.912.

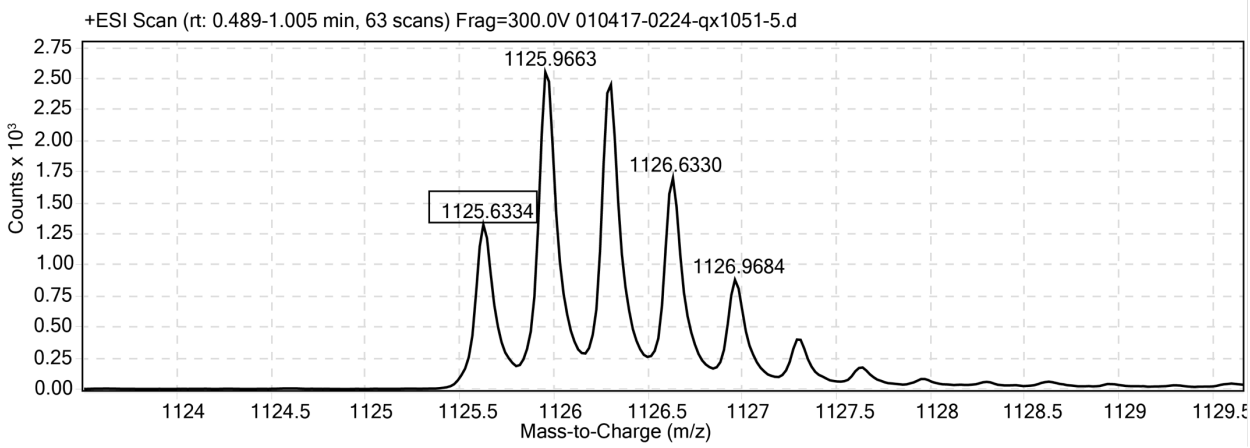


Figure S51. ESI-TOF MS data for **p3α6** (QX10515). Expected [M+3H$^+$]/3 = 1125.640.

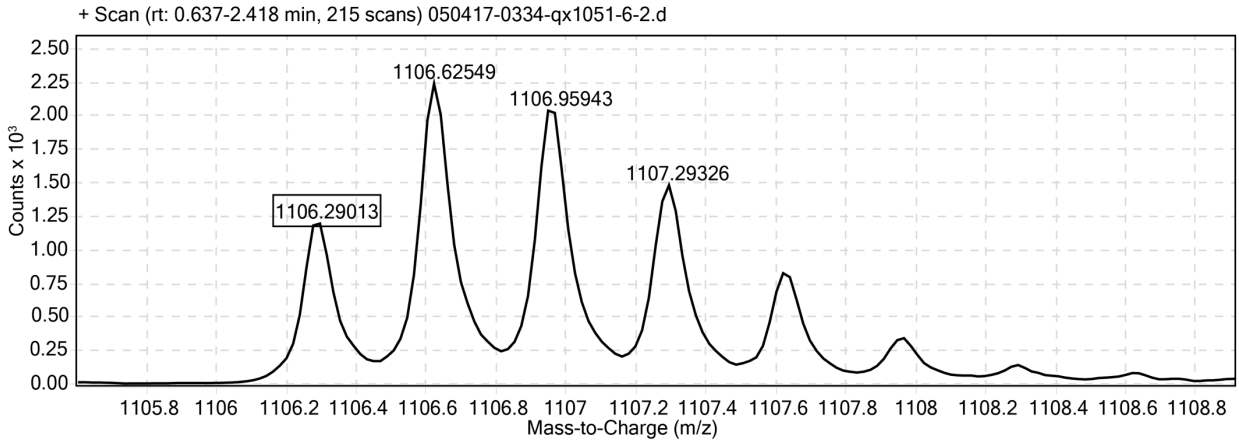


Figure S52. ESI-TOF MS data for **p3α6-KA** (QX10516). Expected $[M+3H^+]/3$ = 1106.305.

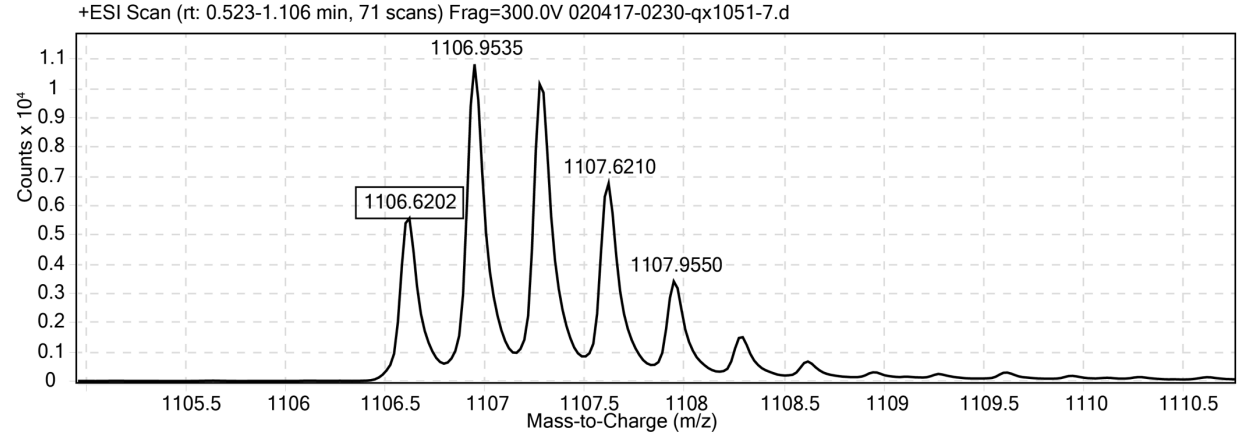


Figure S53. ESI-TOF MS data for **p3α6-AE** (QX10517). Expected $[M+3H^+]/3$ = 1106.621.

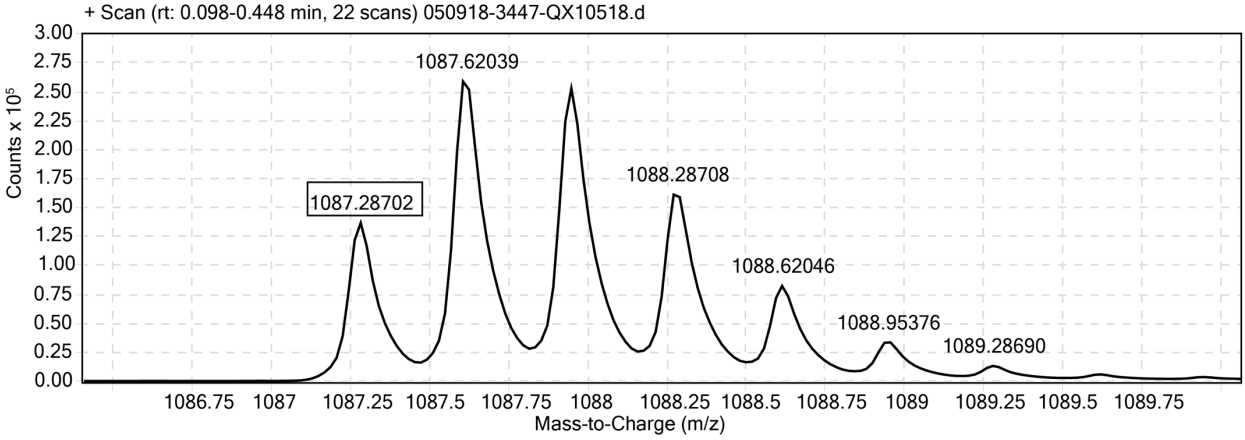


Figure S54. ESI-TOF MS data for **p3α6-AA** (QX10518). Expected $[M+3H^+]/3$ = 1087.286.

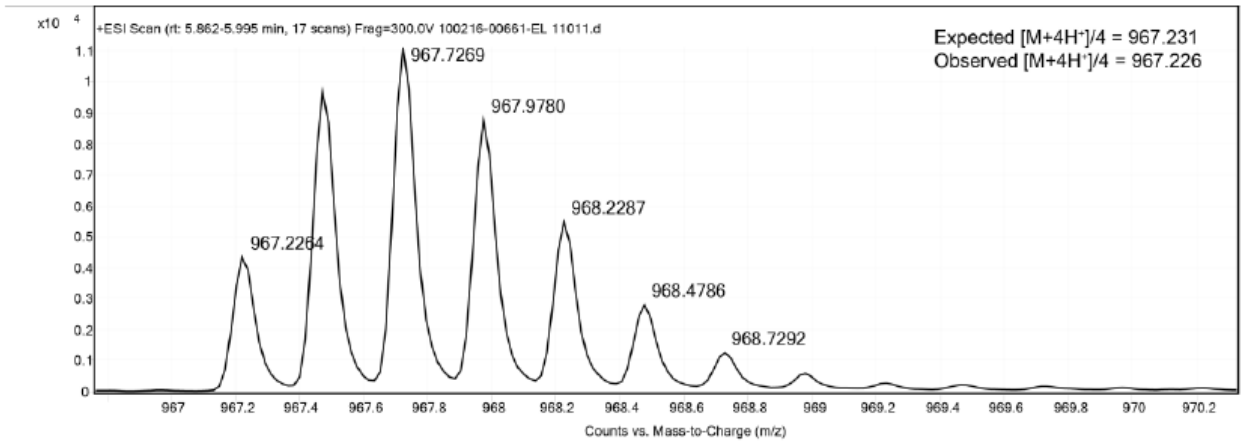


Figure S55. ESI-TOF MS data for **β18** (EL1101). Expected [M+4H$^+$]/4 = 967.231.

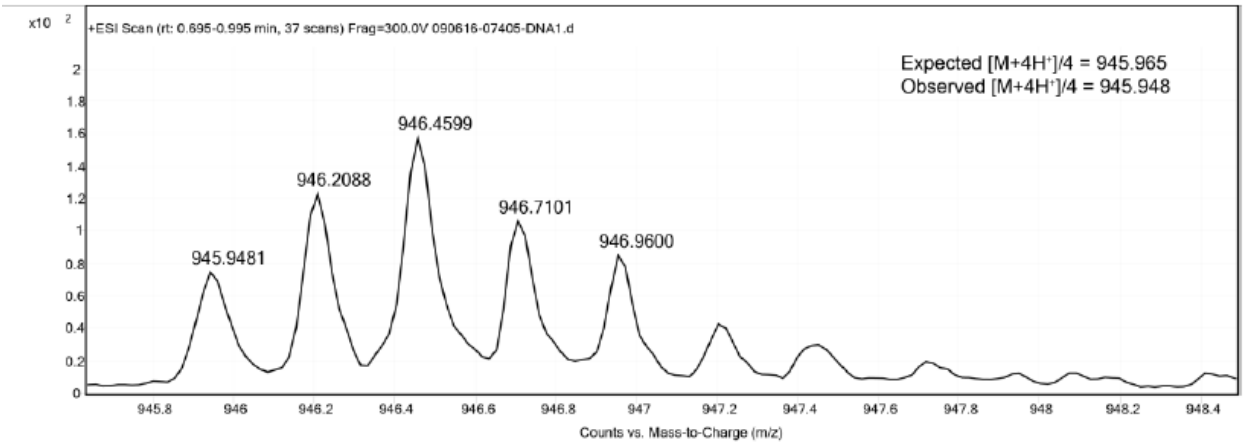


Figure S56. ESI-TOF MS data for **β18-DA**. Expected [M+4H$^+$]/4 = 945.965.

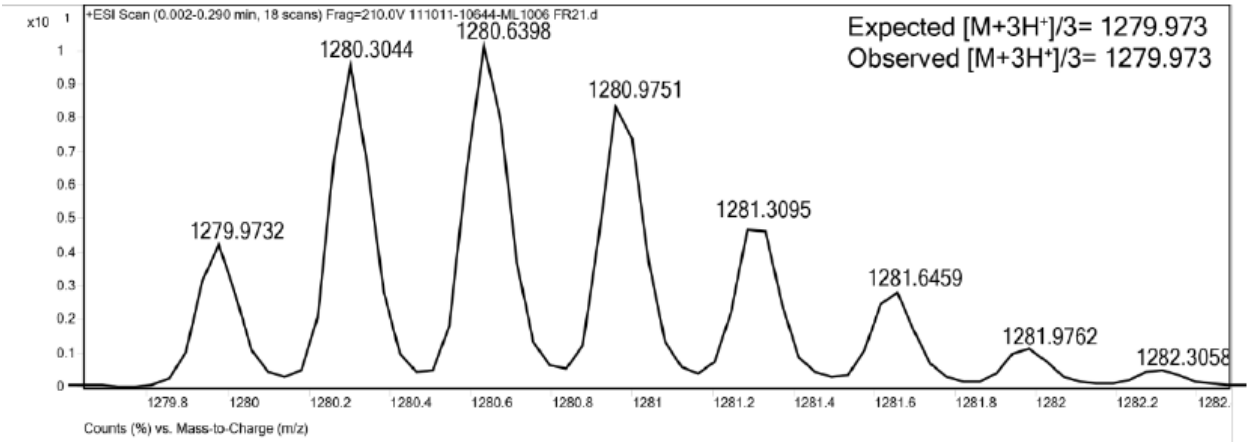


Figure S57. ESI-TOF MS data for **β18-SR** (ML1006). Expected [M+4H$^+$]/3 = 1279.973.

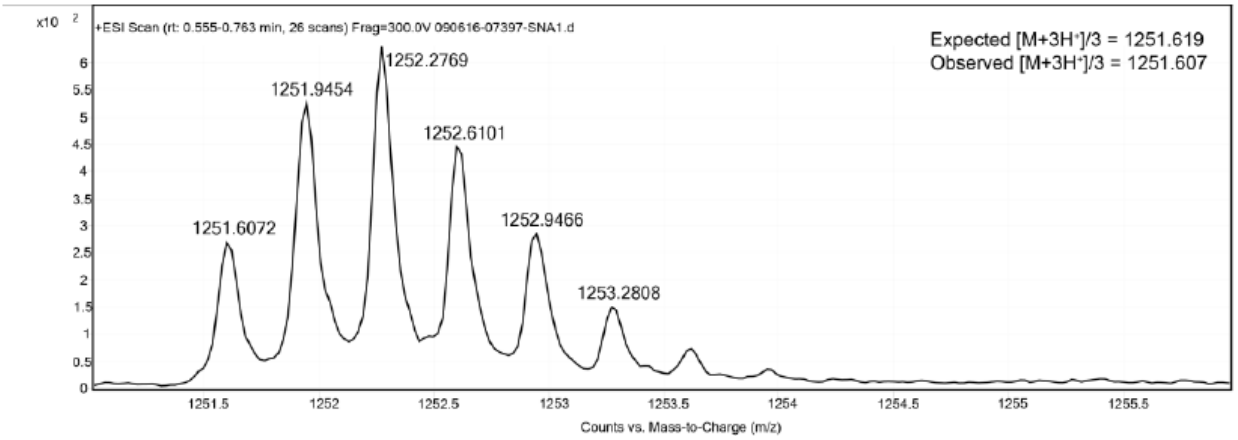


Figure S58. ESI-TOF MS data for **β18-SA**. Expected [M+4H$^+$]/3 = 1251.619.

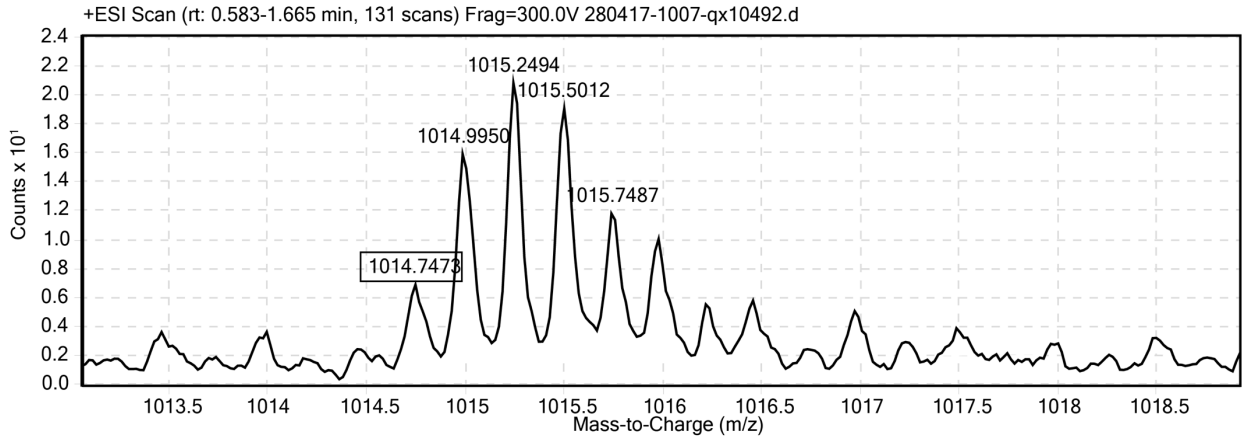


Figure S59. ESI-TOF MS data for **pβ18** (QX10492). Expected [M+4H$^+$]/4 = 1014.747.

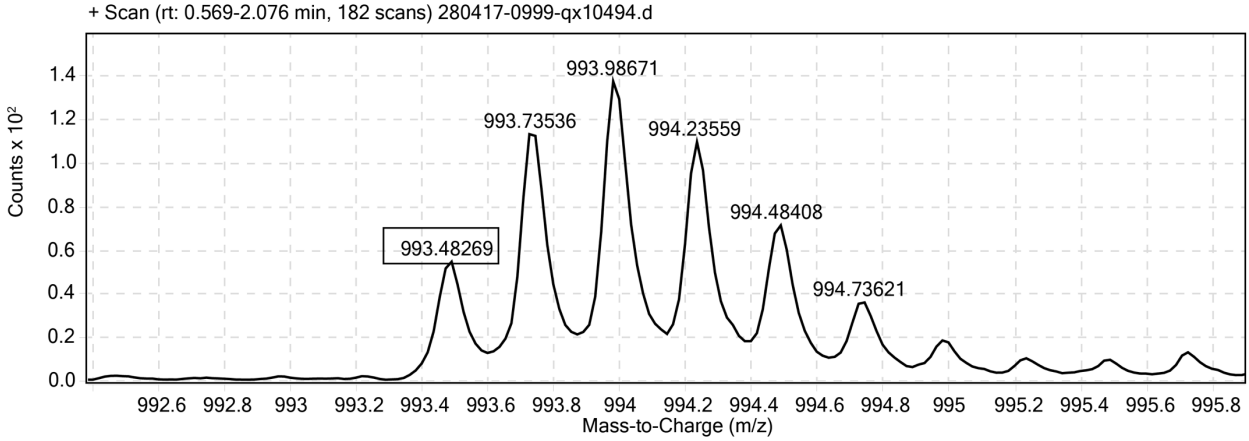


Figure S60. ESI-TOF MS data for **pβ18-DA** (QX10494). Expected [M+4H$^+$]/4 = 993.495.

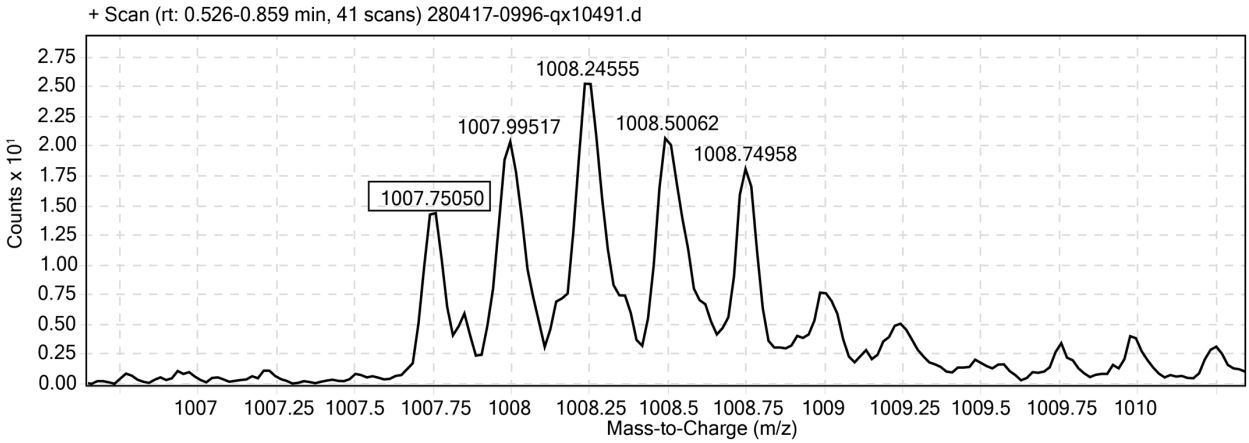


Figure S61. ESI-TOF MS data for **pβ18-SR** (QX10491). Expected $[M+4H^+]/4$ = 1007.762.

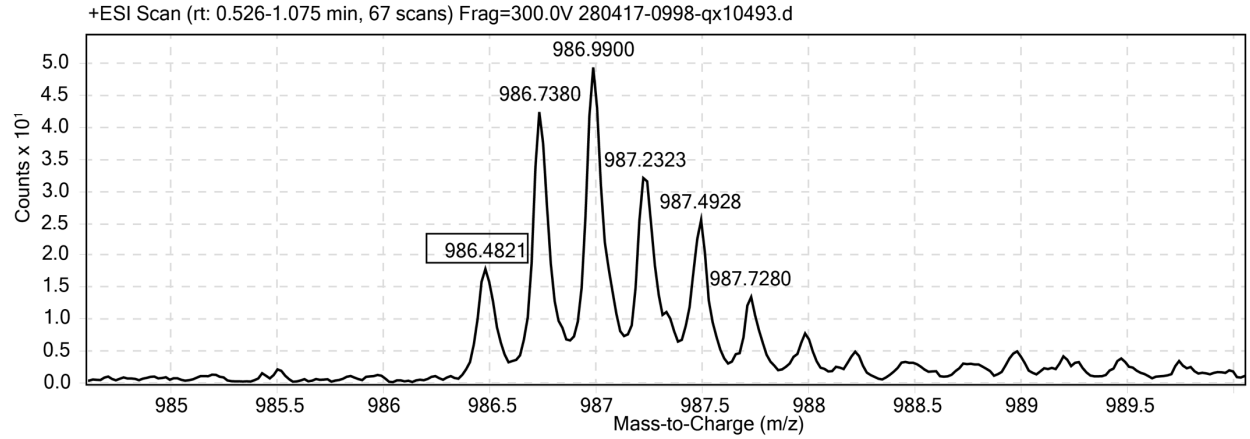


Figure S62. ESI-TOF MS data for **pβ18-SA** (QX10493). Expected $[M+4H^+]/4$ = 986.496.

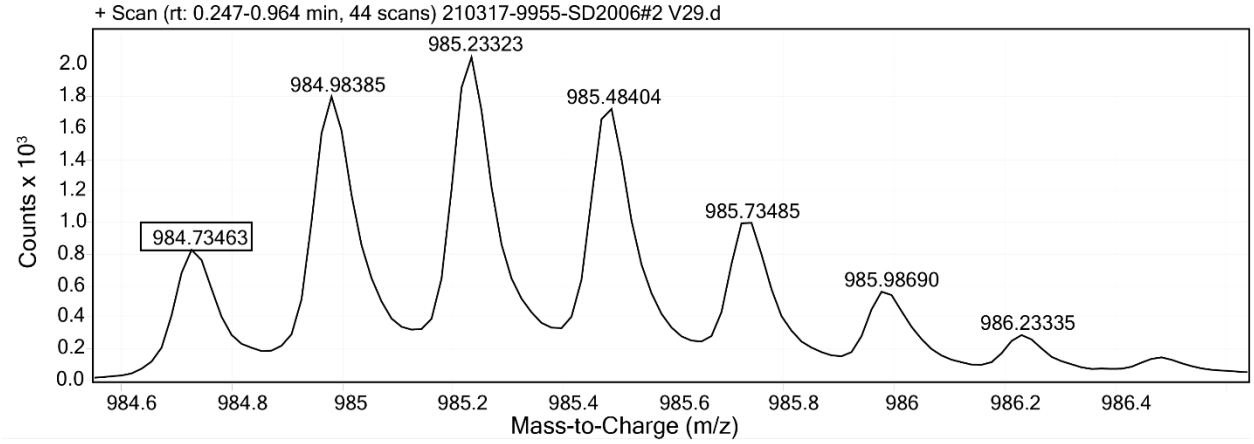


Figure S63. ESI-TOF MS data for **β23-EA** (SD2006#2). Expected $[M+4H^+]/4$ = 984.741.

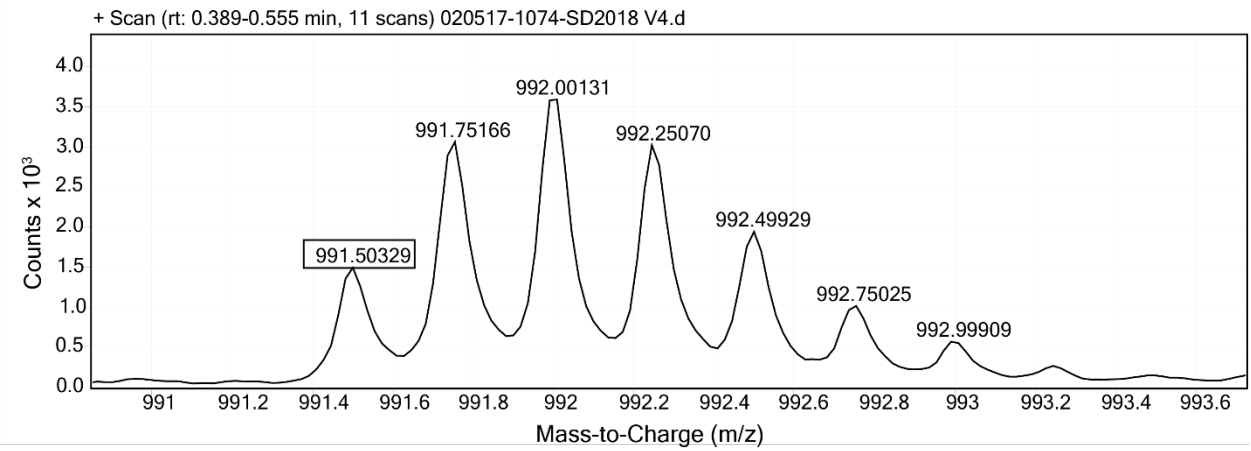


Figure S64. ESI-TOF MS data for **β23-AR** (SD2018). Expected $[M+4H^+]/4$ = 991.506.

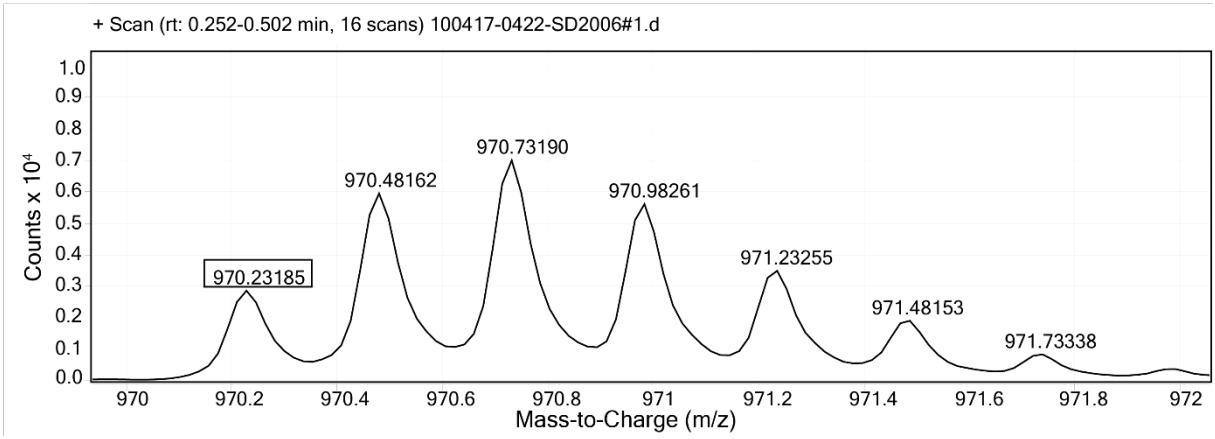


Figure S65. ESI-TOF MS data for **β23-AA** (SD2006#1). Expected $[M+4H^+]/4$ = 970.240.

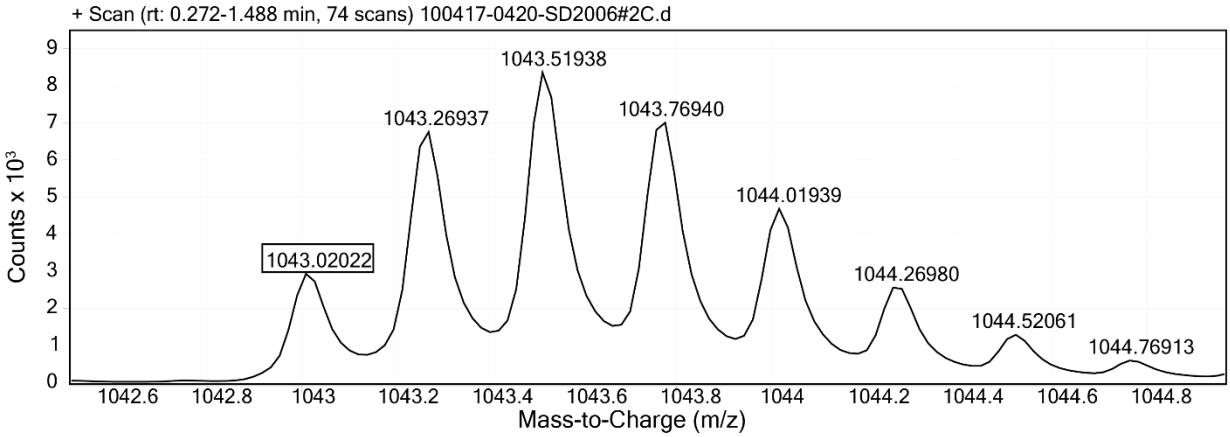


Figure S66. ESI-TOF MS data for p**β23-EA** (SD2006#2C). Expected $[M+4H^+]/4$ = 1043.026.

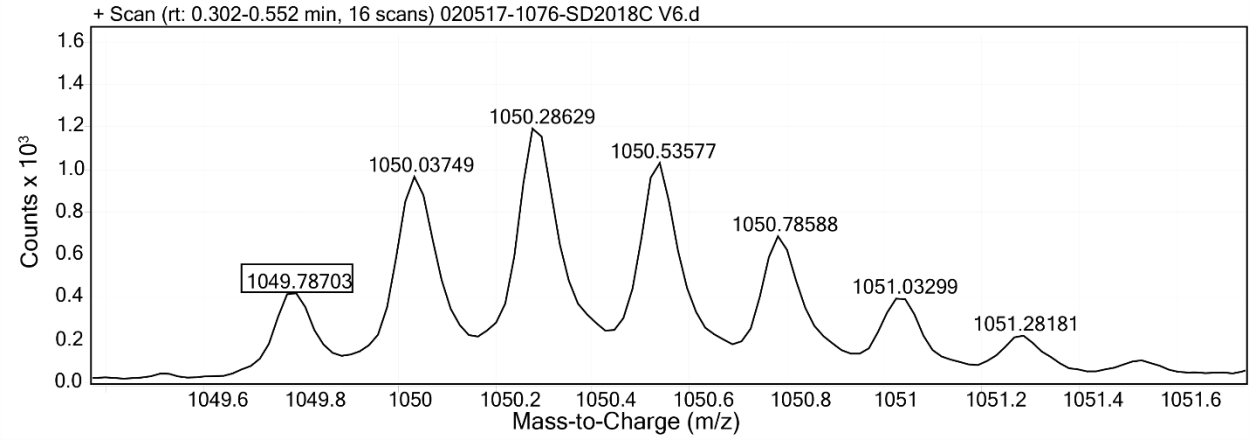


Figure S67. ESI-TOF MS data for **pβ23-AR** (SD2018C). Expected [M+4H$^+$]/4 = 1049.790.

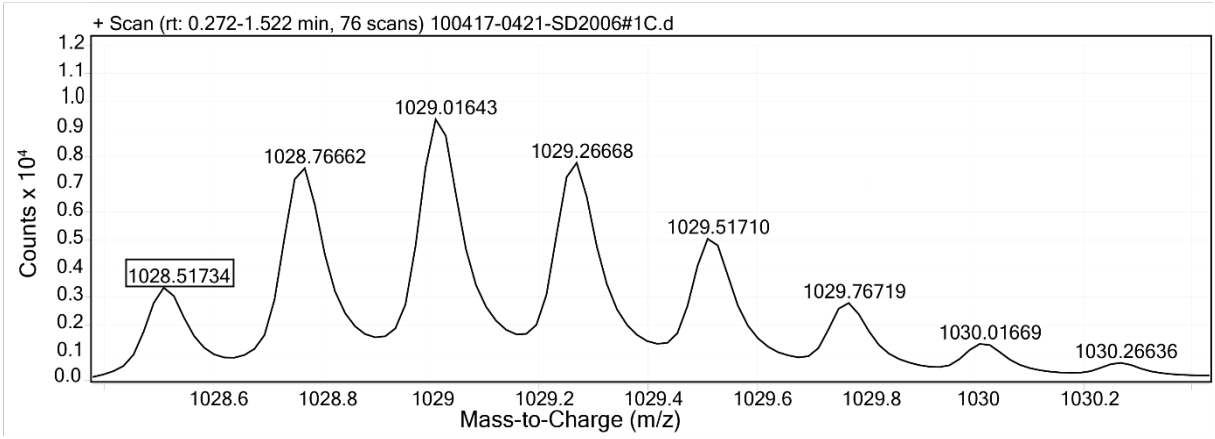


Figure S68. ESI-TOF MS data for **pβ23-AA** (SD2006#1C). Expected [M+4H$^+$]/4 = 1028.524.

Analytical HPLC data.

Peptide solution was injected onto a C18 analytical column and eluted with a linear gradient of 10-60% B (A = H2O, 0.1% TFA; B= MeCN, 0.1% TFA) over 50 min.; 10-min. rinse (95% B); and 10-min. column re-equilibration.

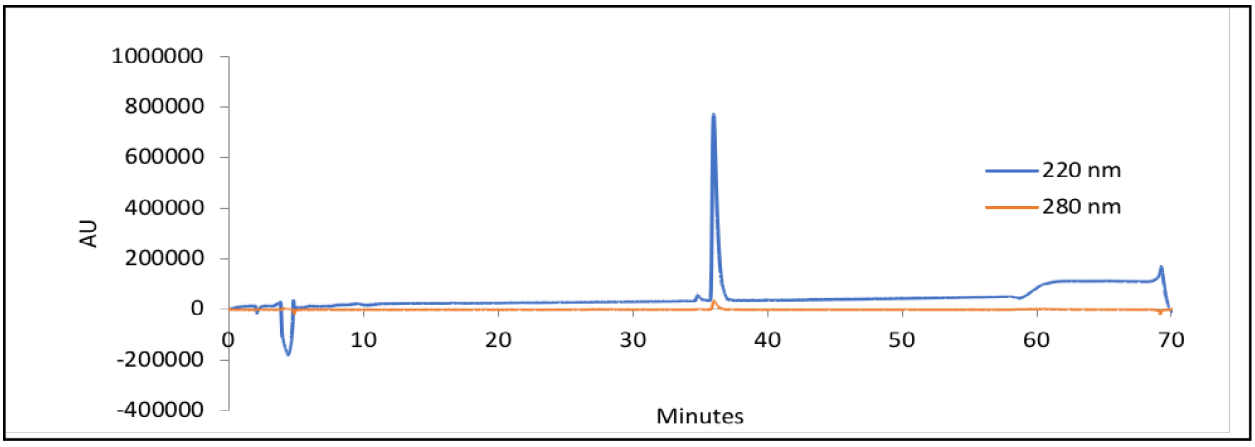


Figure S69. Analytical HPLC data for **2α1** (QX108111). Retention time = 36.042 minutes.

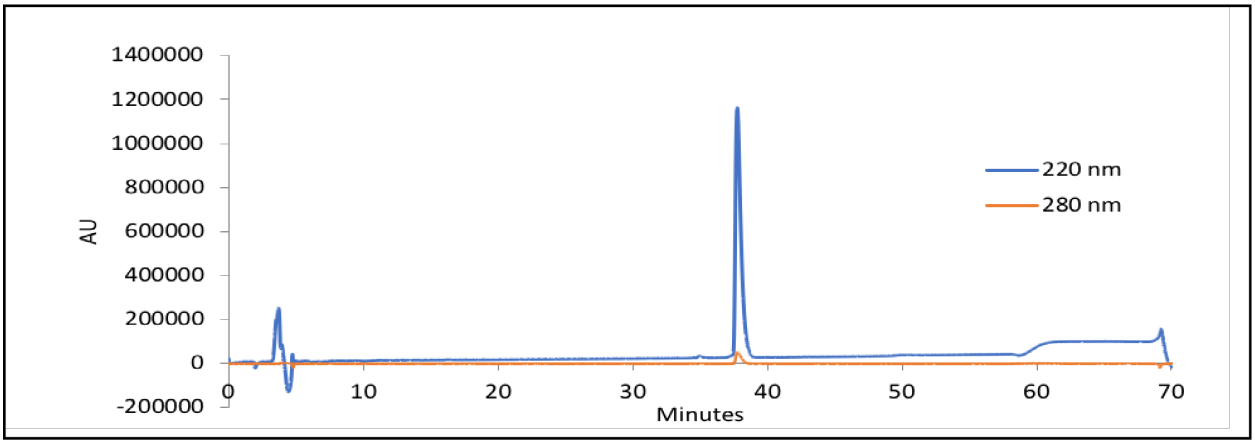


Figure S70. Analytical HPLC data for **p2α1** (QX108111p). Retention time = 37.750 minutes.

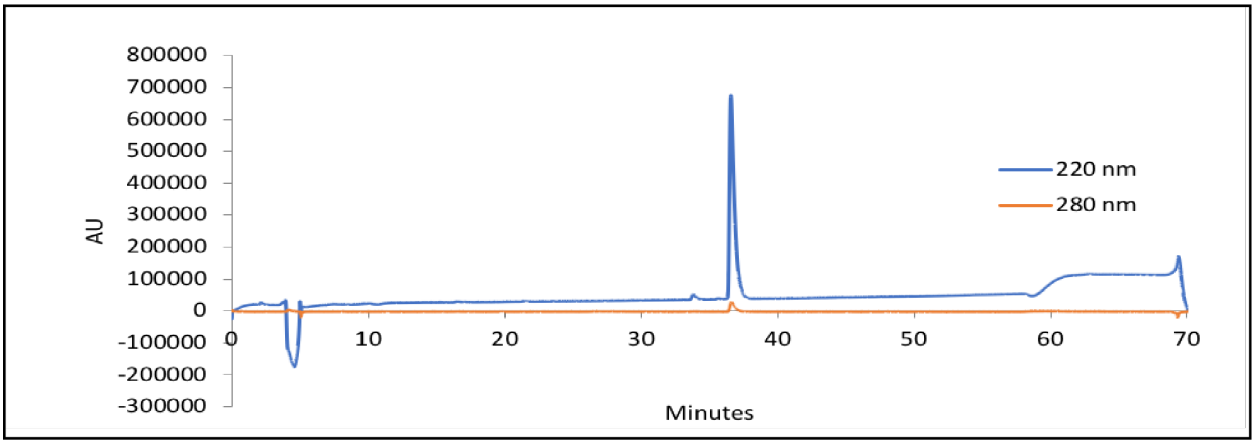


Figure S71. Analytical HPLC data for **2α3** (QX108110). Retention time = 36.625 minutes.

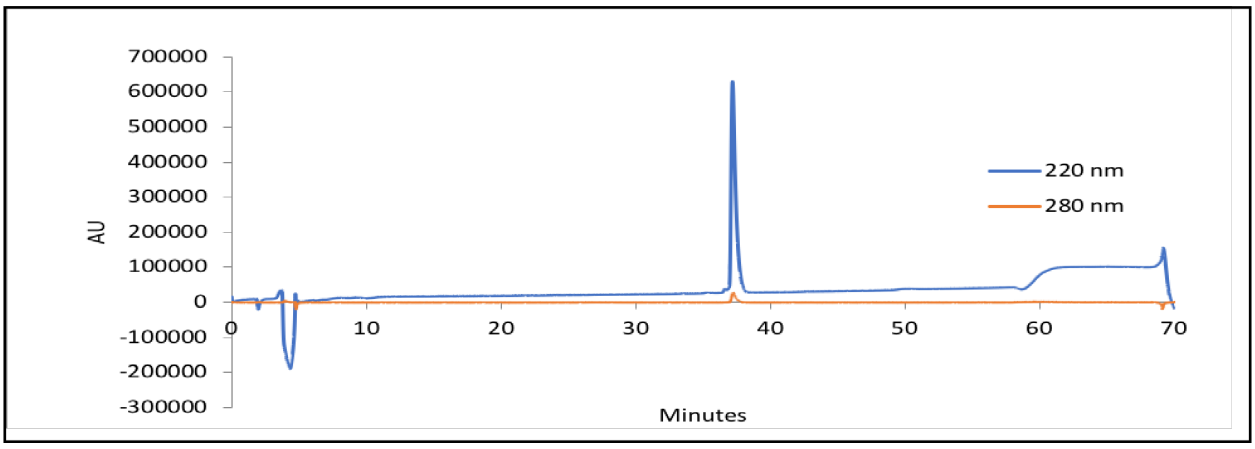


Figure S72. Analytical HPLC data for **p2α3** (QX108110p). Retention time = 37.233 minutes.

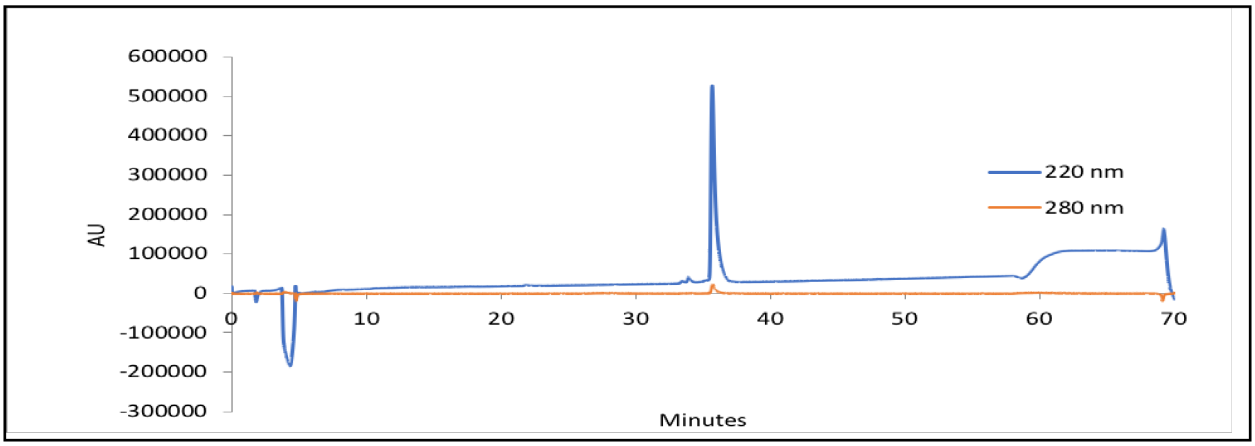


Figure S73. Analytical HPLC data for **2α4** (QX10819). Retention time = 35.683 minutes.

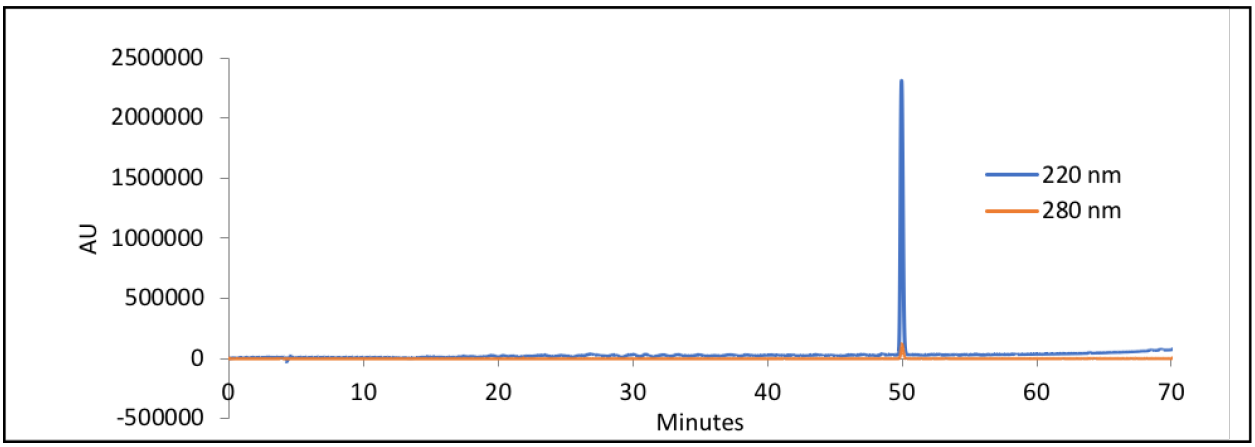


Figure S74. Analytical HPLC data for **2α4-KA** (QX11192). Retention time = 49.983 minutes.

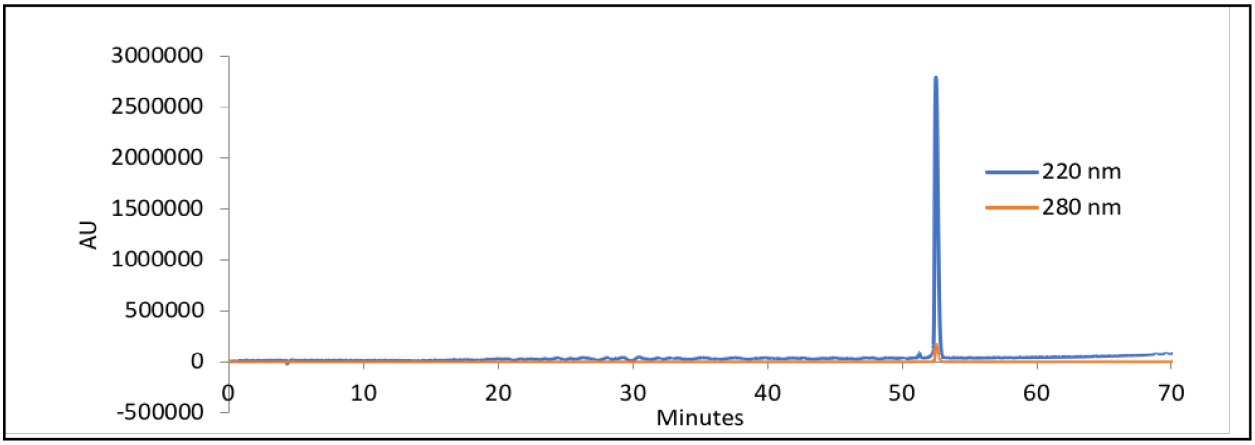


Figure S75. Analytical HPLC data for **2α4-AE** (QX11193). Retention time = 52.491 minutes.

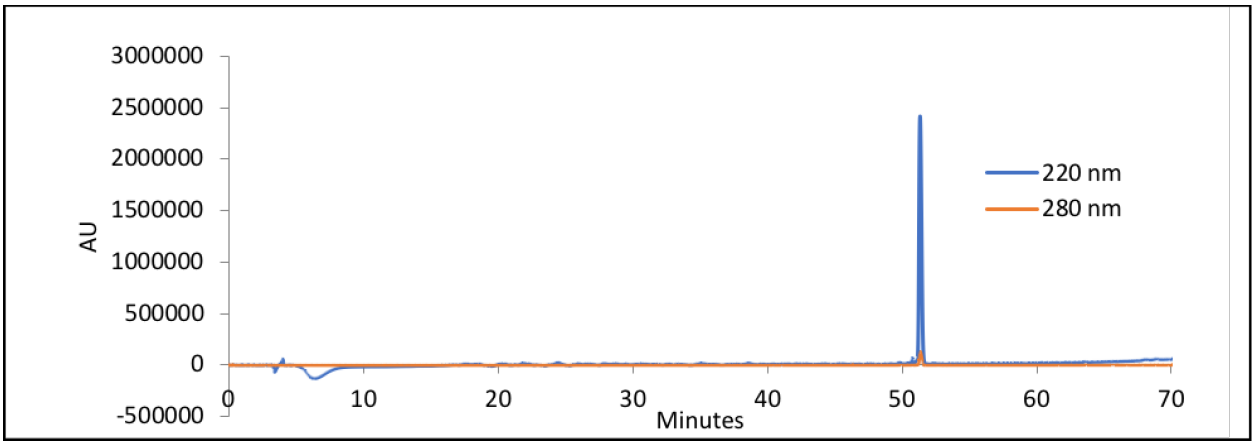


Figure S76. Analytical HPLC data for **2α4-AA** (QX11191). Retention time = 51.358 minutes.

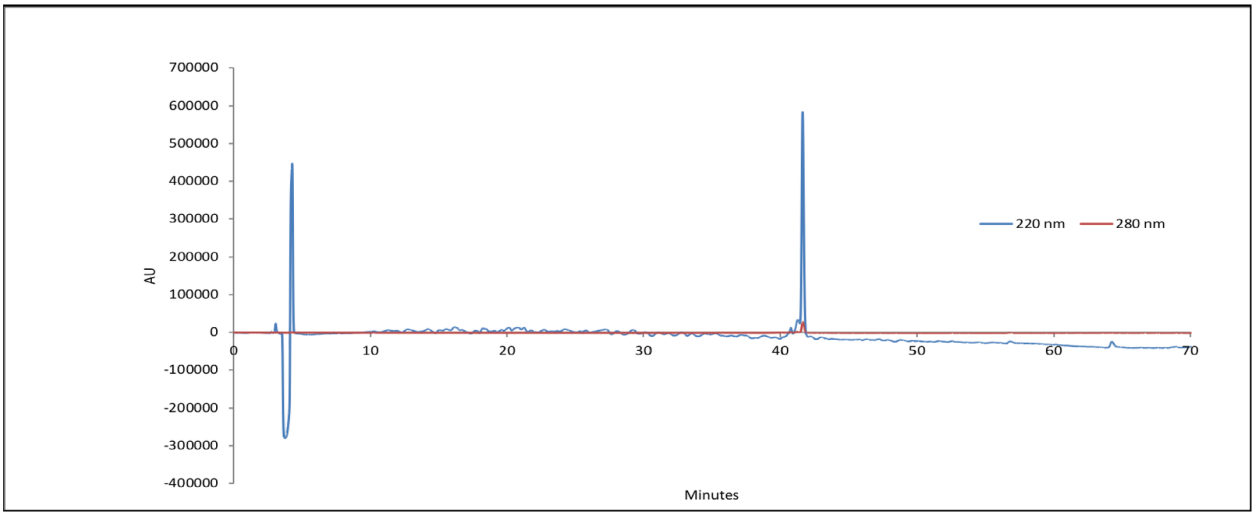


Figure S77. Analytical HPLC data for **p2α4** (QX10819p). Retention time = 41.625 minutes.

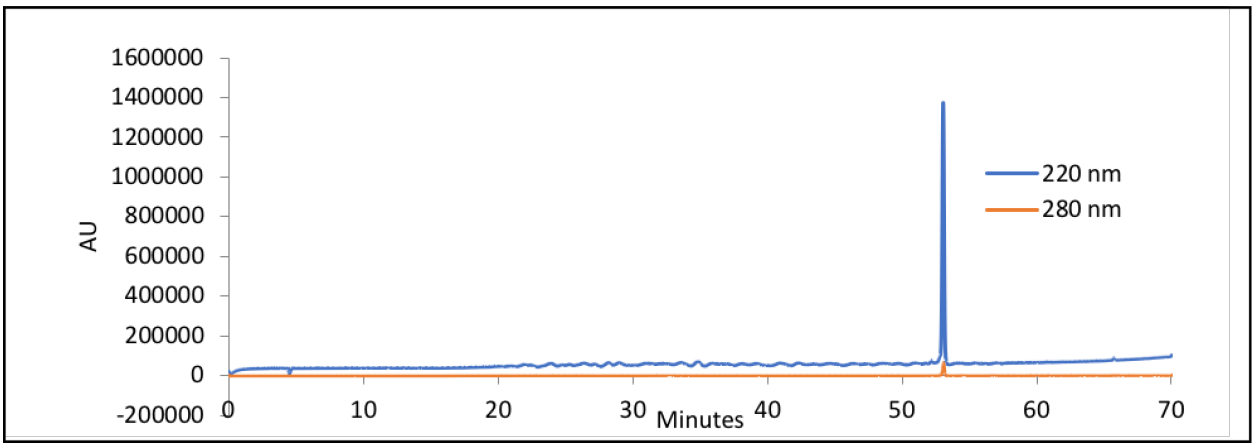


Figure S78. Analytical HPLC data for **p2α4-KA** (QX11195). Retention time = 53.067 minutes.

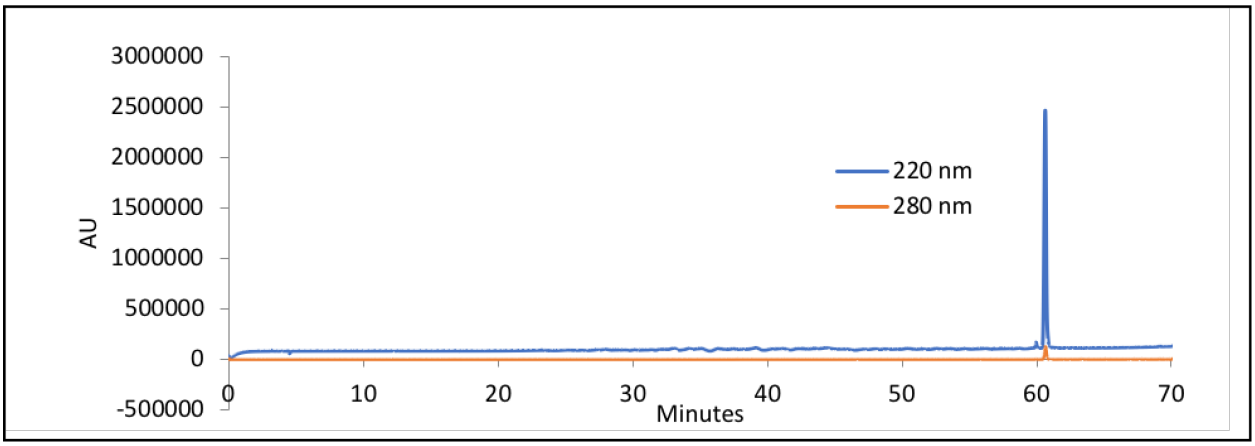


Figure S79. Analytical HPLC data for **p2α4-AE** (QX11196). Retention time = 60.617 minutes.

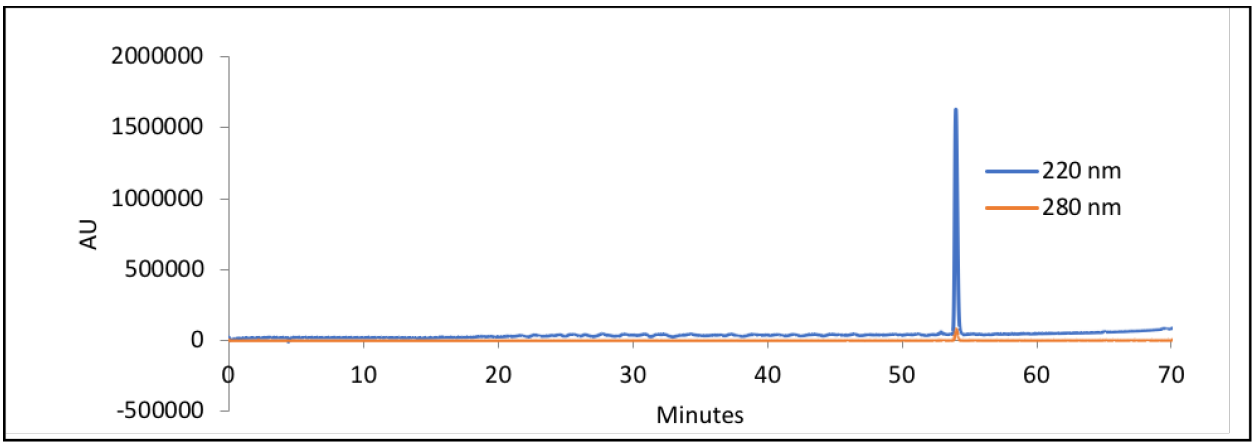


Figure S80. Analytical HPLC data for **p2α4-AA** (QX11194). Retention time = 54.008 minutes.

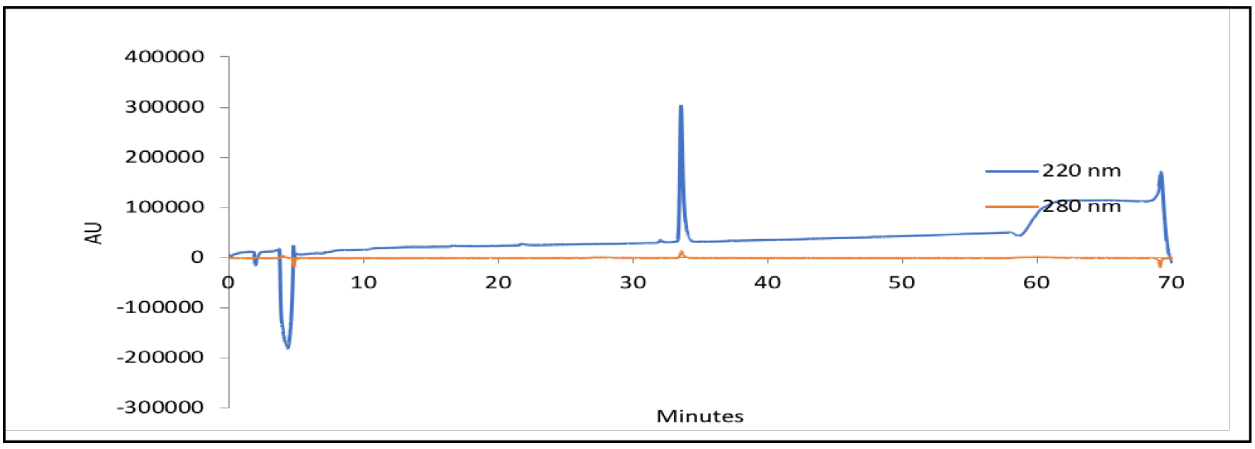


Figure S81. Analytical HPLC data for **2α6** (QX10818). Retention time = 33.617 minutes.

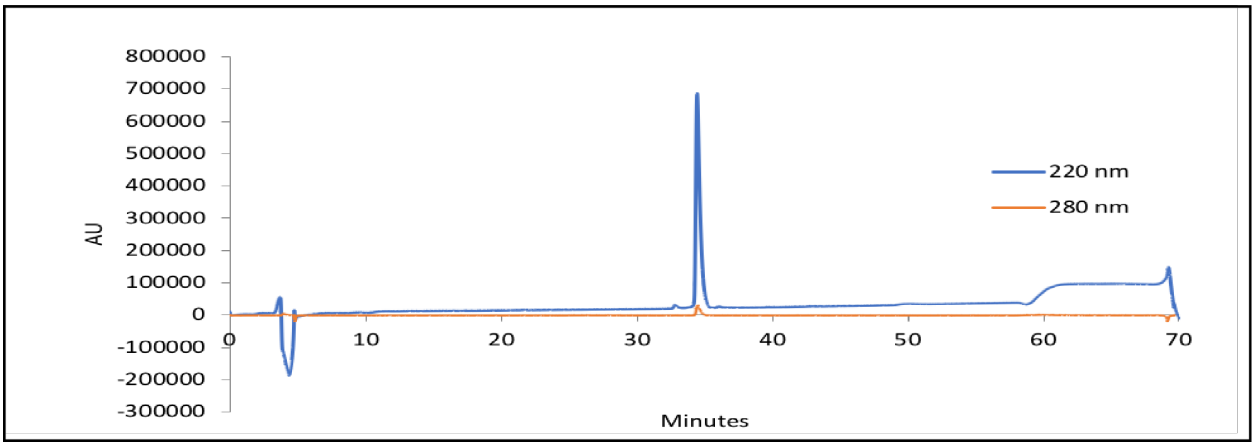


Figure S82. Analytical HPLC data for **p2α6** (QX10818p). Retention time = 34.450 minutes.

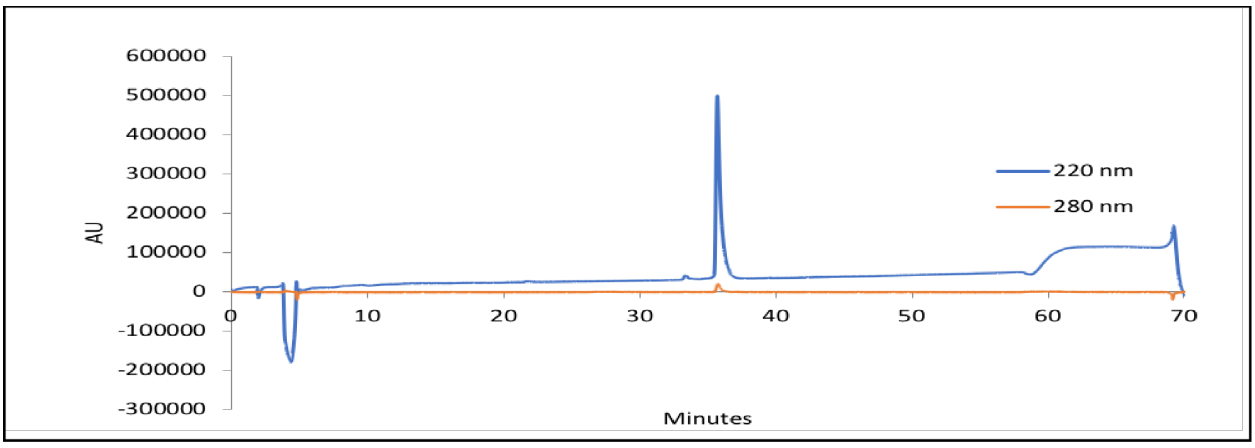


Figure S83. Analytical HPLC data for **2α7** (QX10817). Retention time = 35.750 minutes.

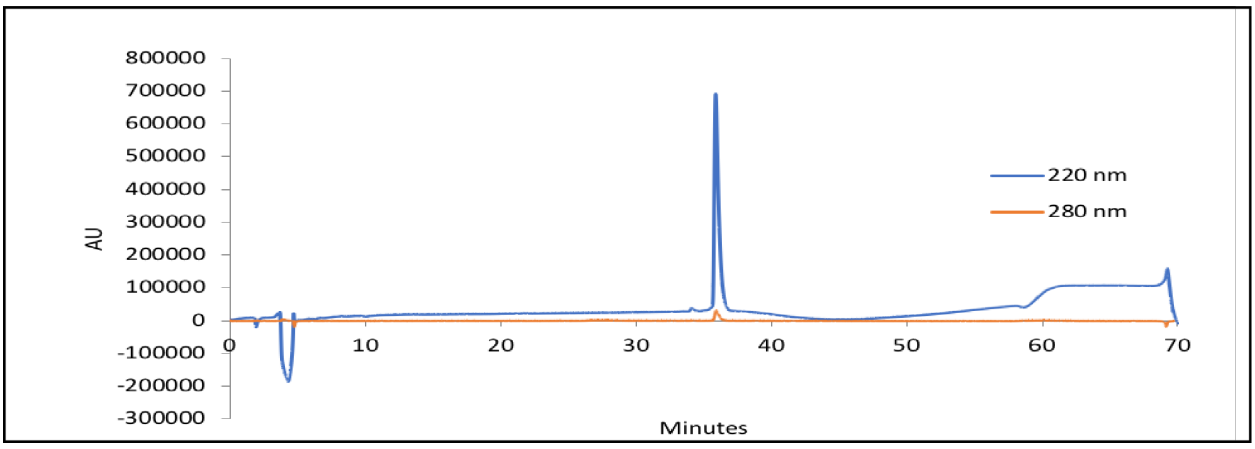


Figure S84. Analytical HPLC data for **p2α7** (QX10817p). Retention time = 35.900 minutes.

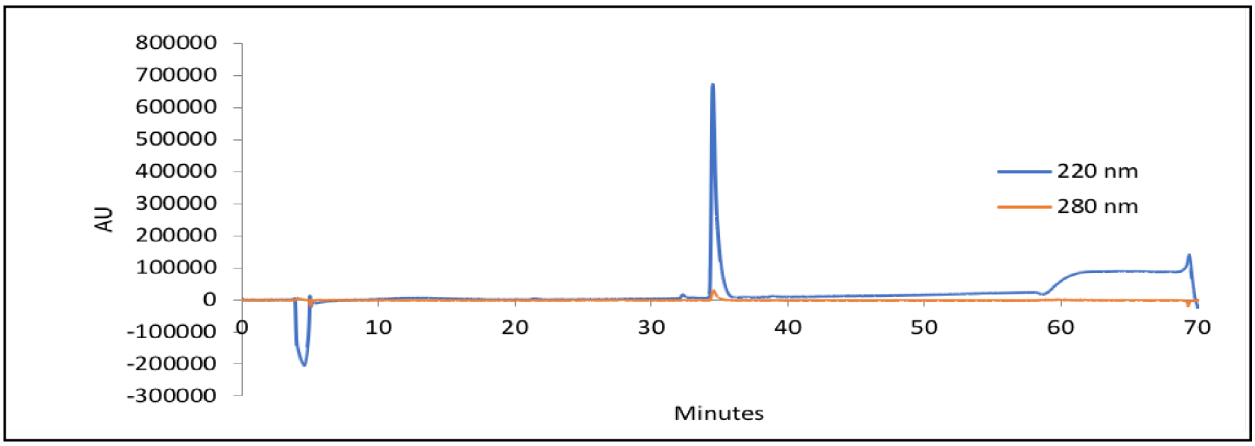


Figure S85. Analytical HPLC data for **2α10** (QX10816). Retention time = 34.525 minutes.

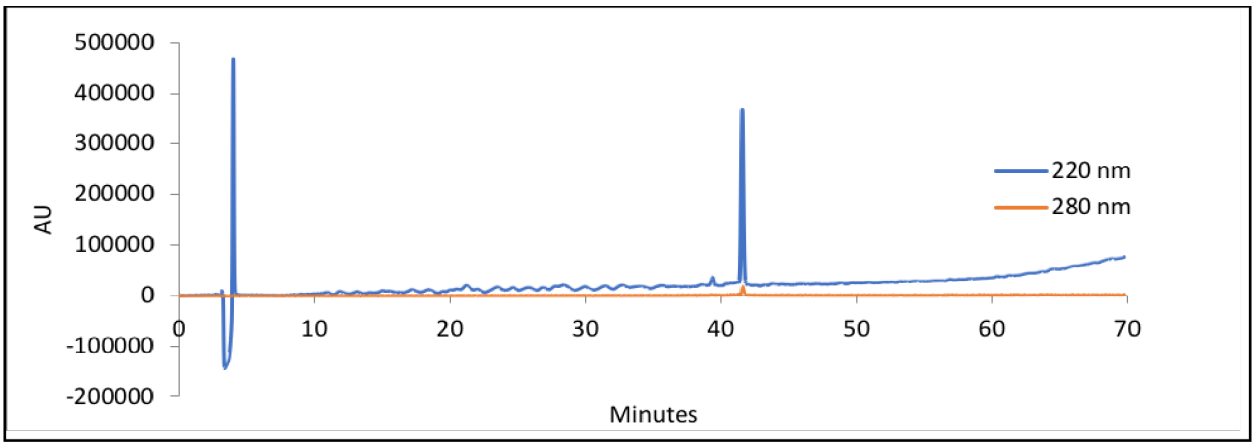


Figure S86. Analytical HPLC data for **p2α10** (QX10816p). Retention time = 41.600 minutes.

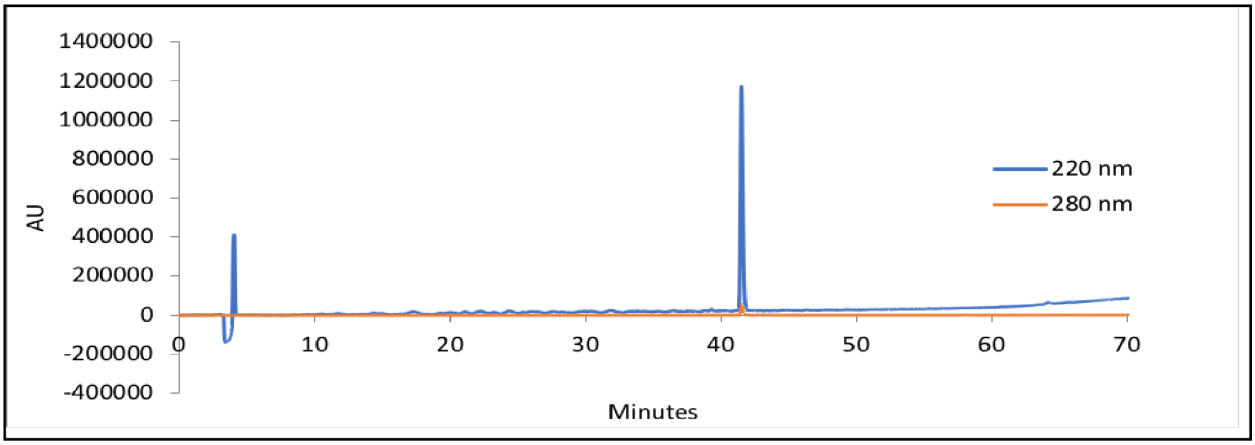


Figure S87. Analytical HPLC data for **2α14** (QX10815). Retention time = 41.525 minutes.

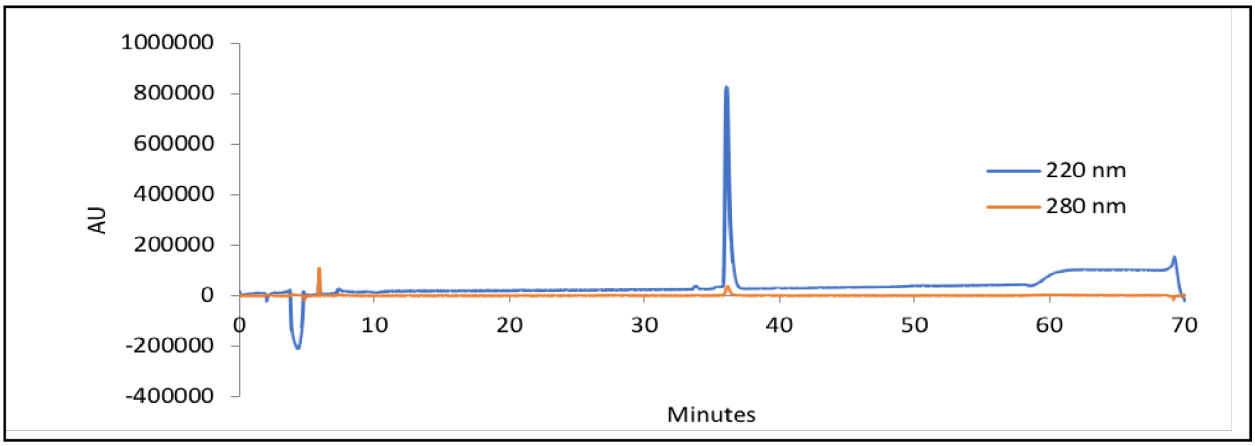


Figure S88. Analytical HPLC data for **p2α14** (QX10815p). Retention time = 36.100 minutes.

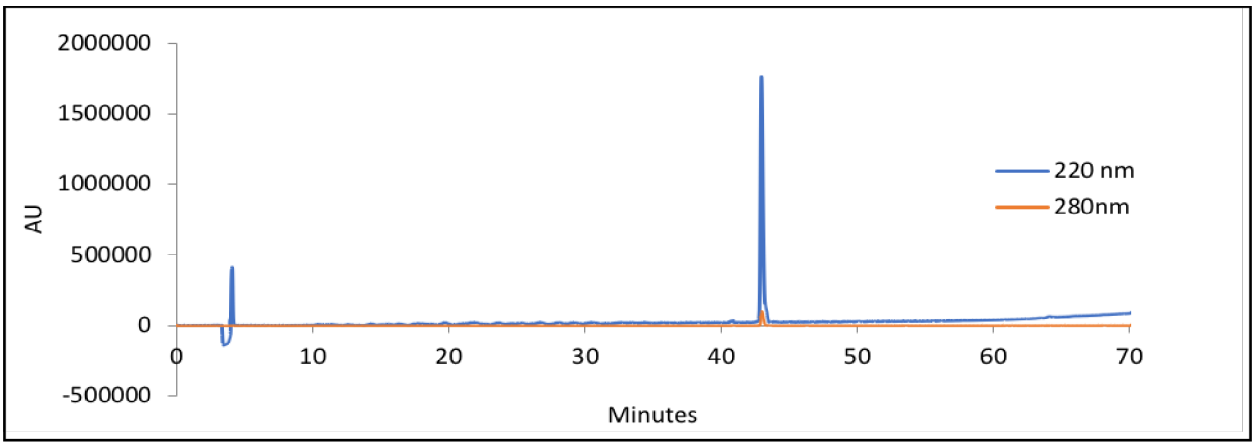


Figure S89. Analytical HPLC data for **2α18** (QX10814). Retention time = 42.958 minutes.

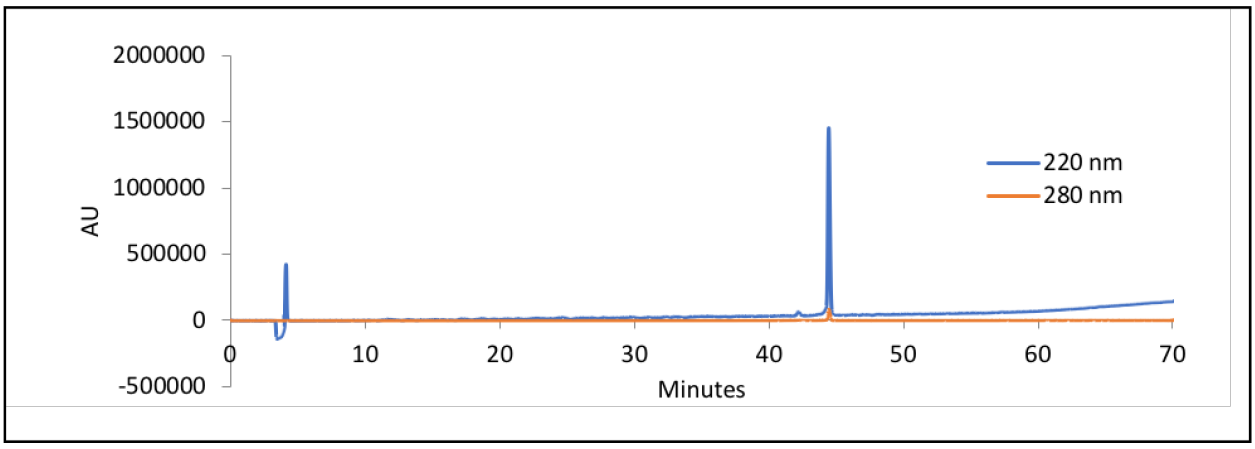


Figure S90. Analytical HPLC data for **2α18-EA** (NAB10212). Retention time = 44.467 minutes.

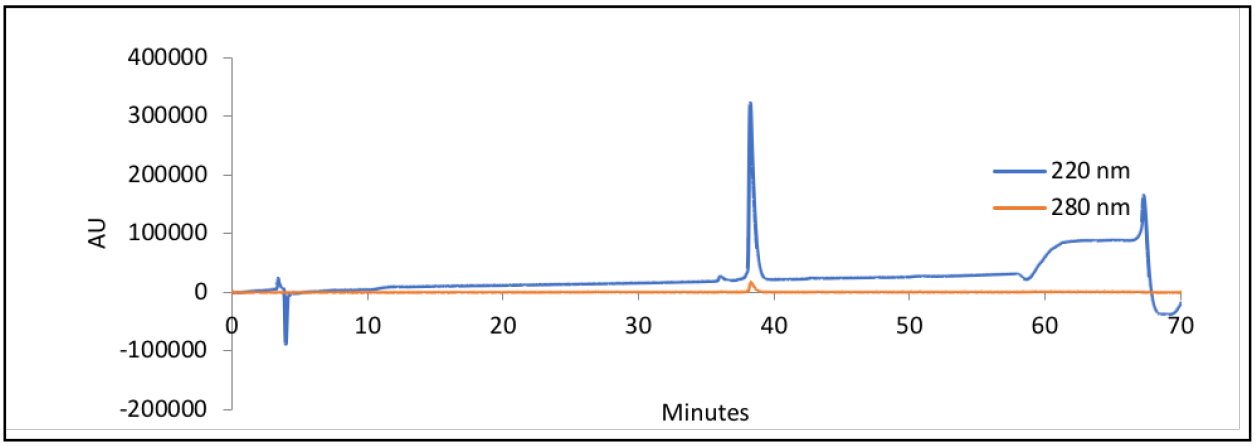


Figure S91. Analytical HPLC data for **2α18-AR** (NAB10211). Retention time = 38.275 minutes.

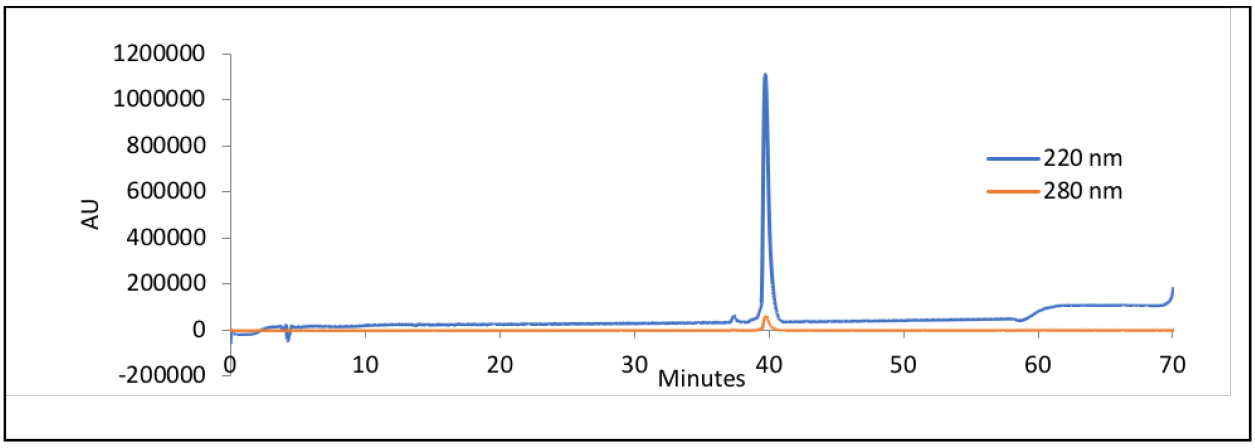


Figure S92. Analytical HPLC data for **2α18-AA** (NAB10213). Retention time = 39.775 minutes.

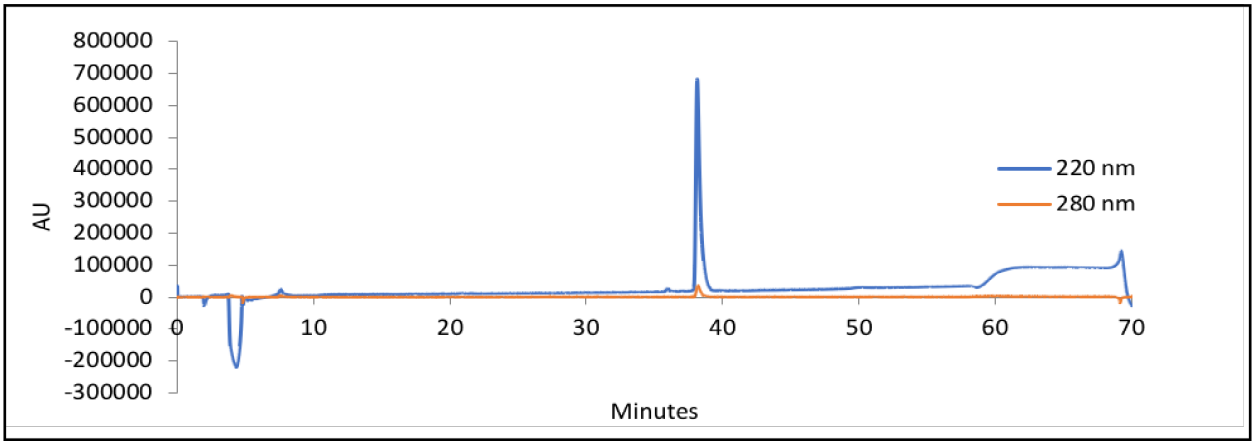


Figure S93. Analytical HPLC data for **p2α18** (QX10814p). Retention time = 38.117 minutes.

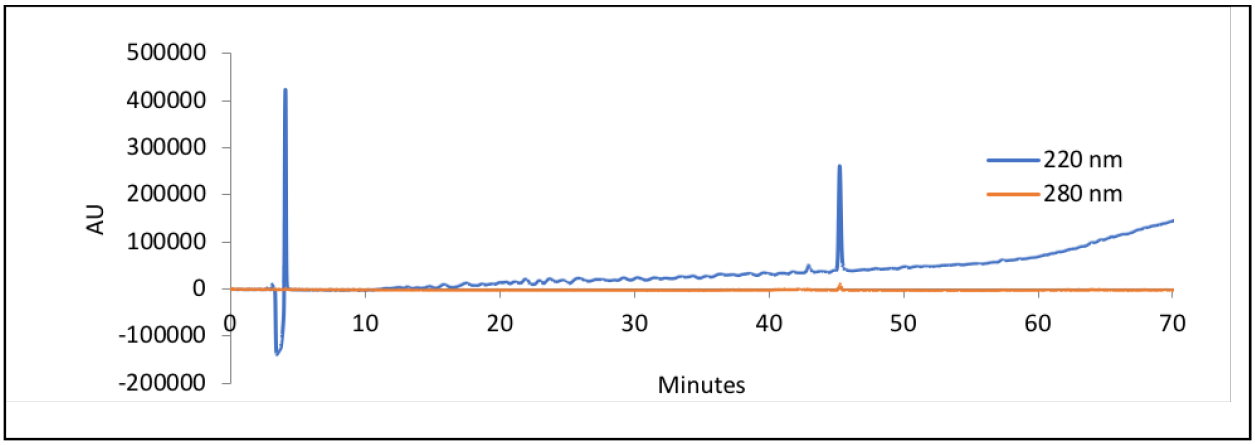


Figure S94. Analytical HPLC data for **p2α18-EA** (NAB10215). Retention time = 45.283 minutes.

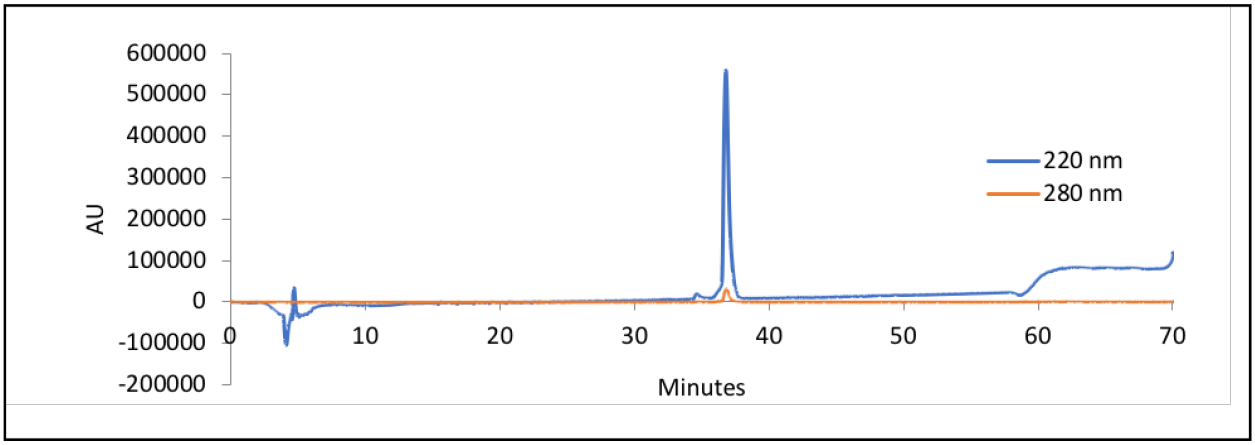


Figure S95. Analytical HPLC data for **p2α18-AR** (NAB10214). Retention time = 36.842 minutes.

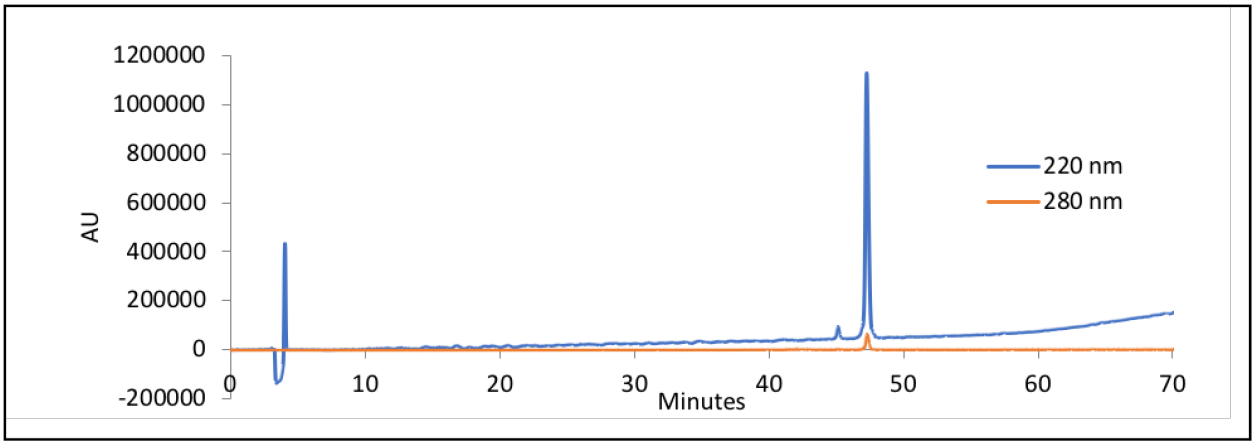


Figure S96. Analytical HPLC data for **p2α18-AA** (NAB10216). Retention time = 47.250 minutes.

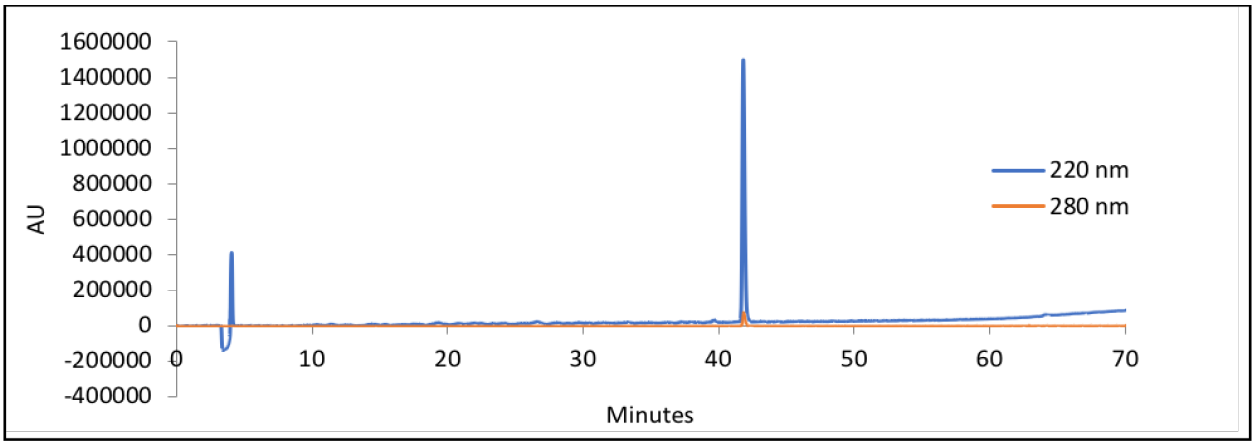


Figure S97. Analytical HPLC data for **2α21** (QX10813). Retention time = 41.825 minutes.

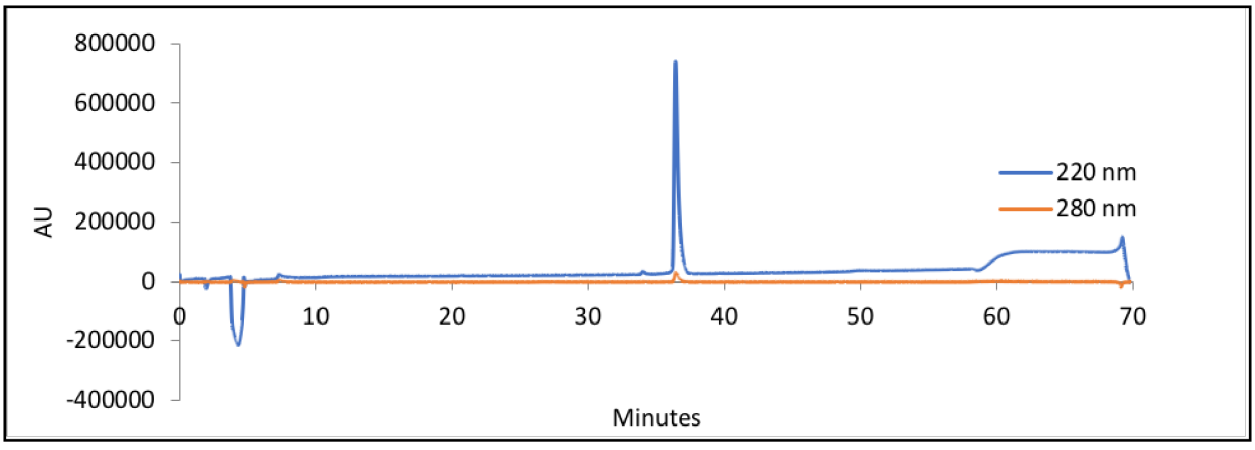


Figure S98. Analytical HPLC data for **p2α21** (QX10813p). Retention time = 36.450 minutes.

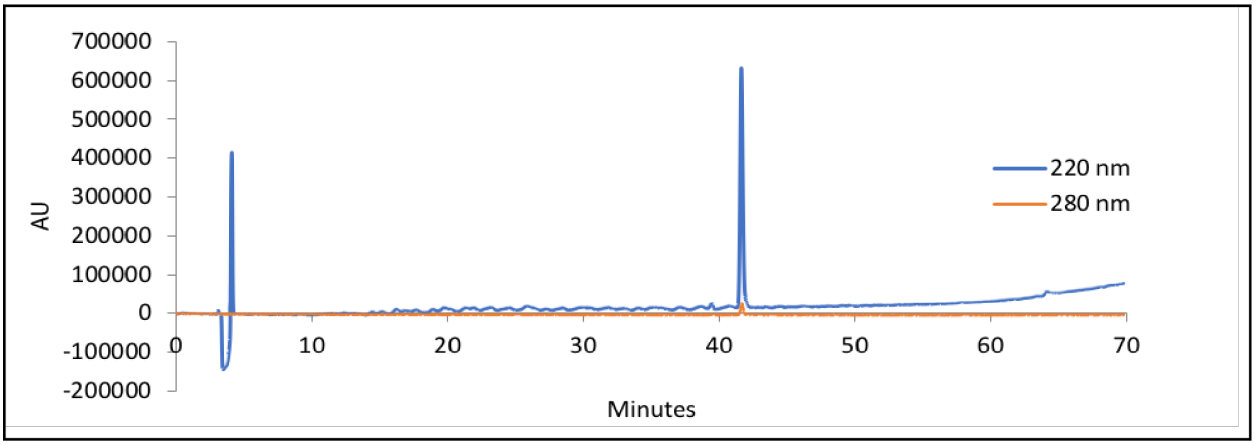


Figure S99. Analytical HPLC data for **2α25** (QX10812). Retention time = 41.667 minutes.

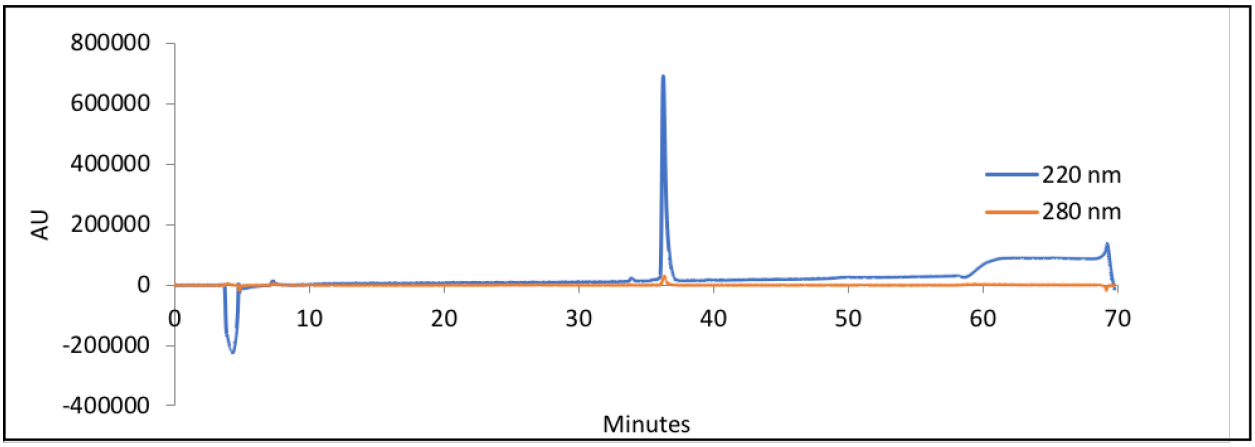


Figure S100. Analytical HPLC data for **p2α25** (QX10812p). Retention time = 36.300 minutes.

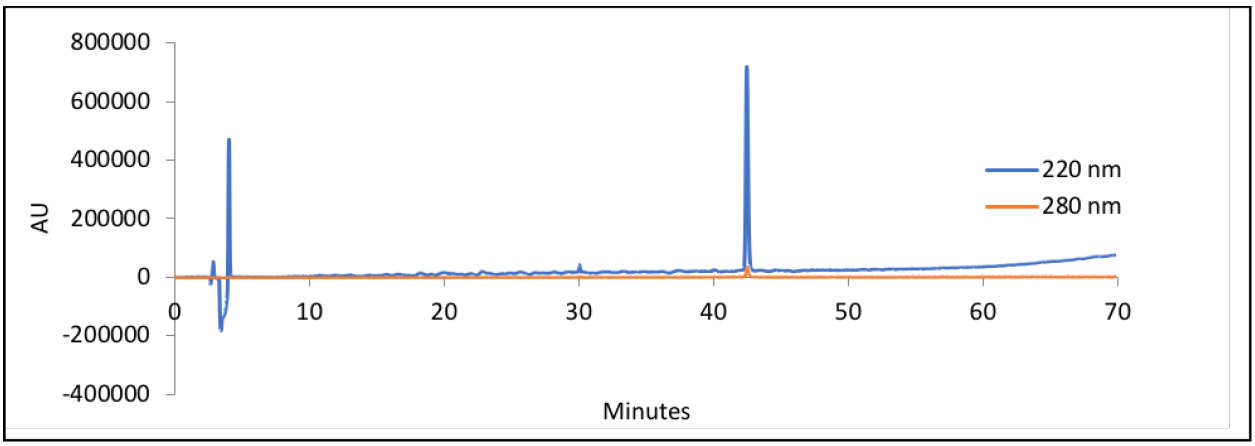


Figure S101. Analytical HPLC data for **2α28** (QX10811). Retention time = 42.492 minutes.

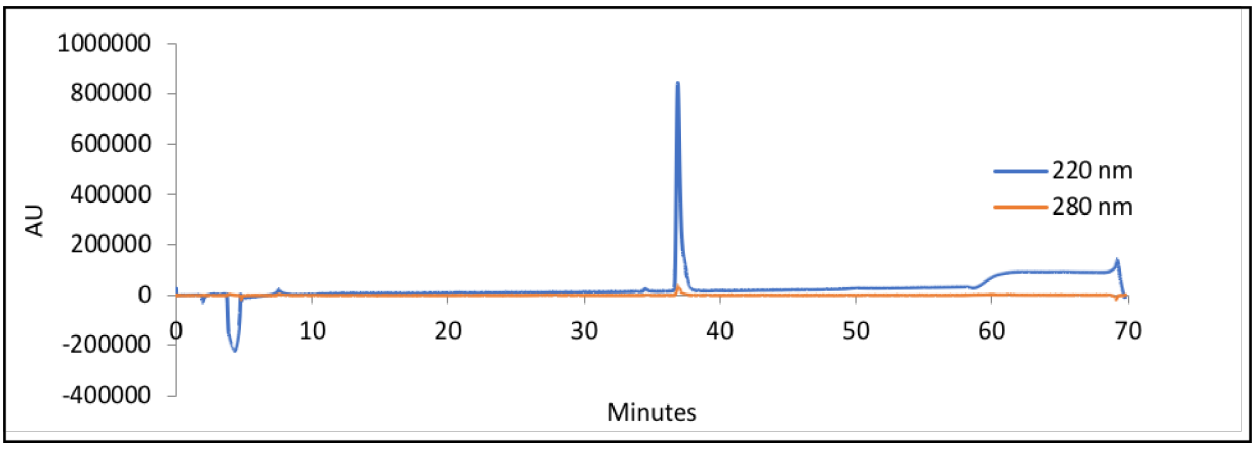


Figure S102. Analytical HPLC data for **p2α28** (QX10811p). Retention time = 36.917 minutes.

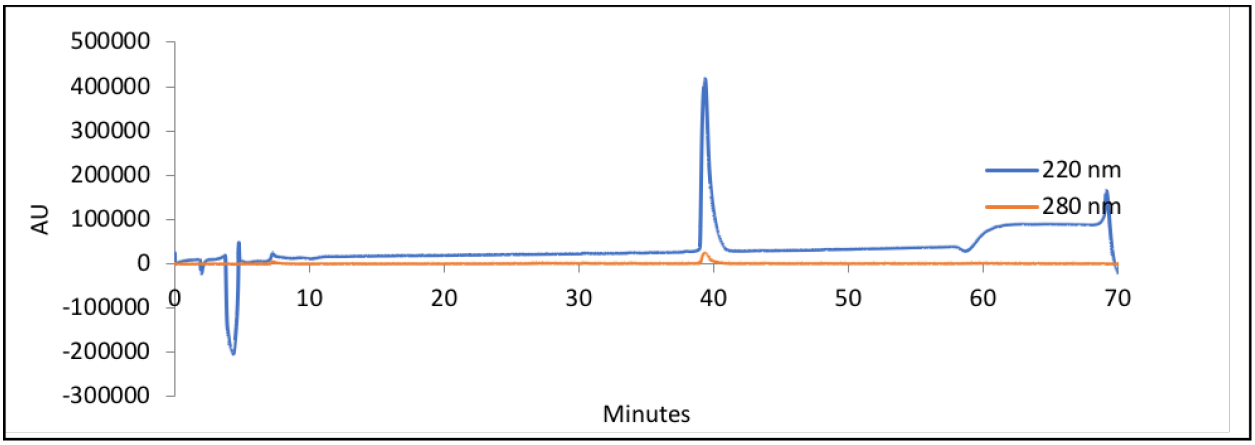


Figure S103. Analytical HPLC data for **3α1** (QX10714). Retention time = 39.442 minutes.

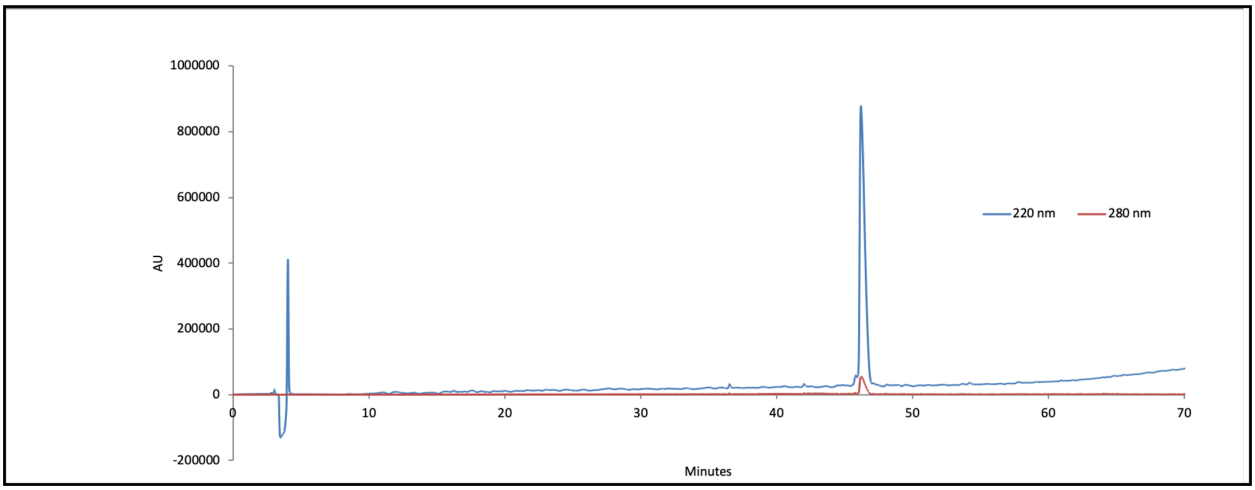


Figure S104. Analytical HPLC data for **3α1-ER** (QX21352). Retention time = 46.250 minutes.

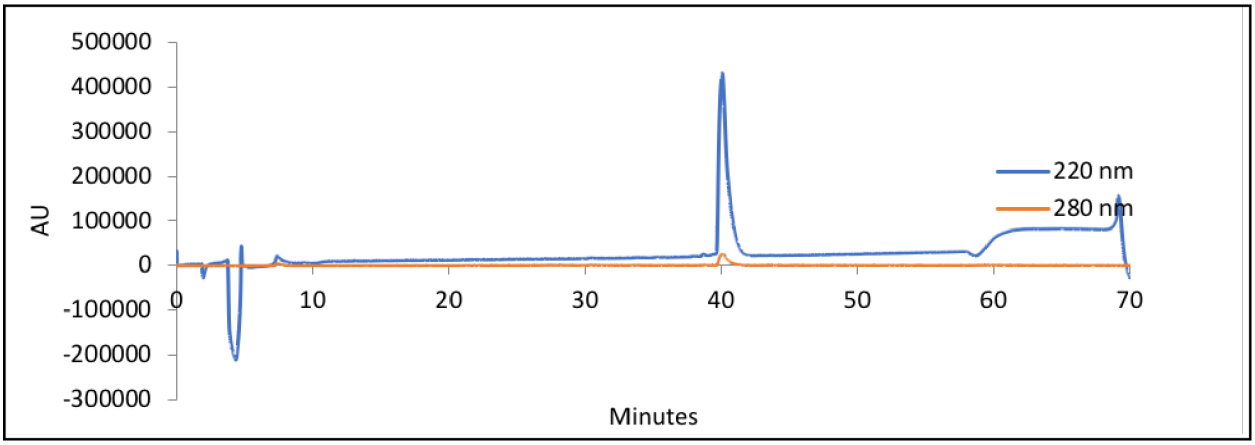


Figure S105. Analytical HPLC data for **3α1-EA** (QX10713). Retention time = 40.150 minutes.

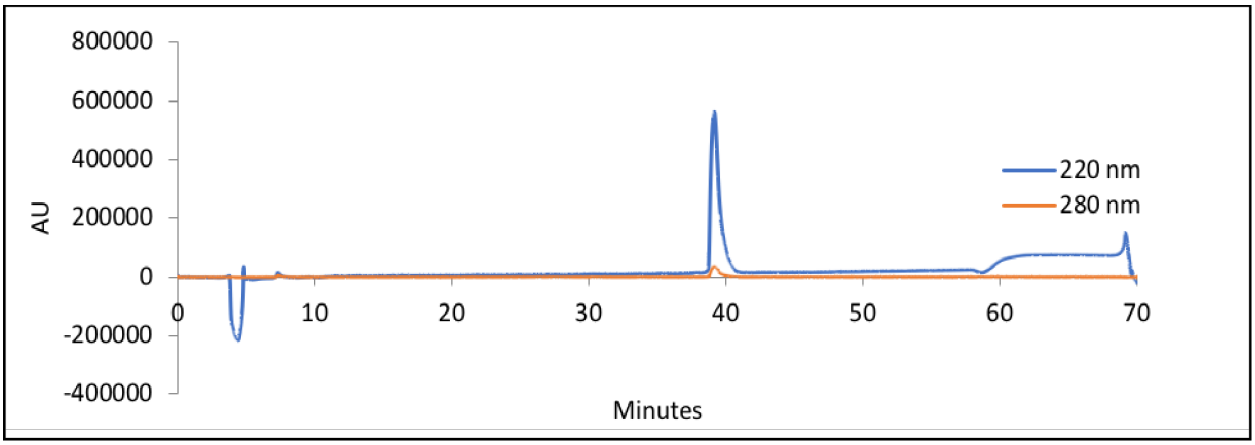


Figure S106. Analytical HPLC data for **3α1-AK** (QX10712). Retention time = 39.217 minutes.

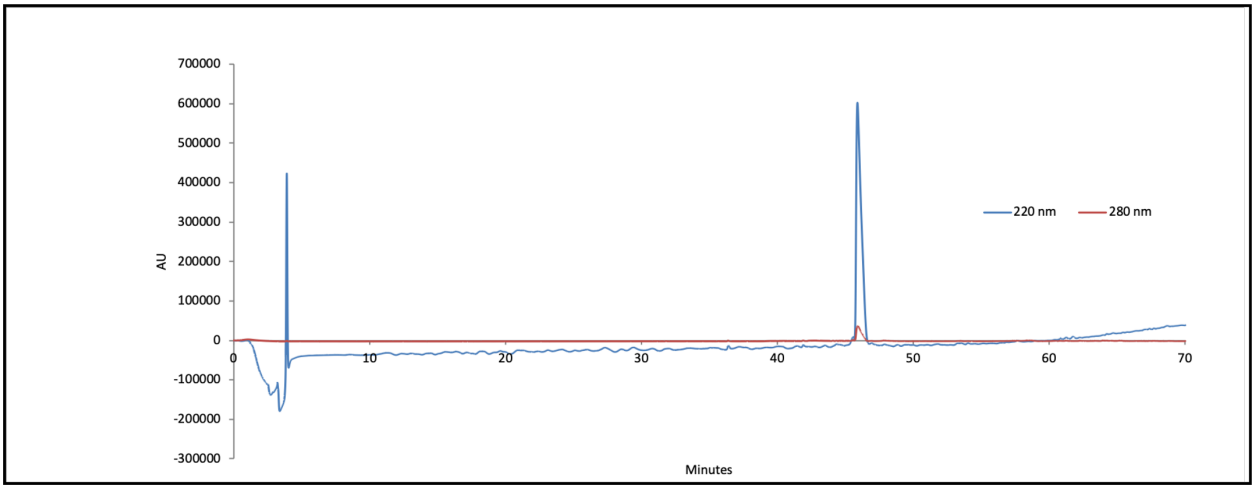


Figure S107. Analytical HPLC data for **3α1-AR** (QX21531). Retention time = 45.933 minutes.

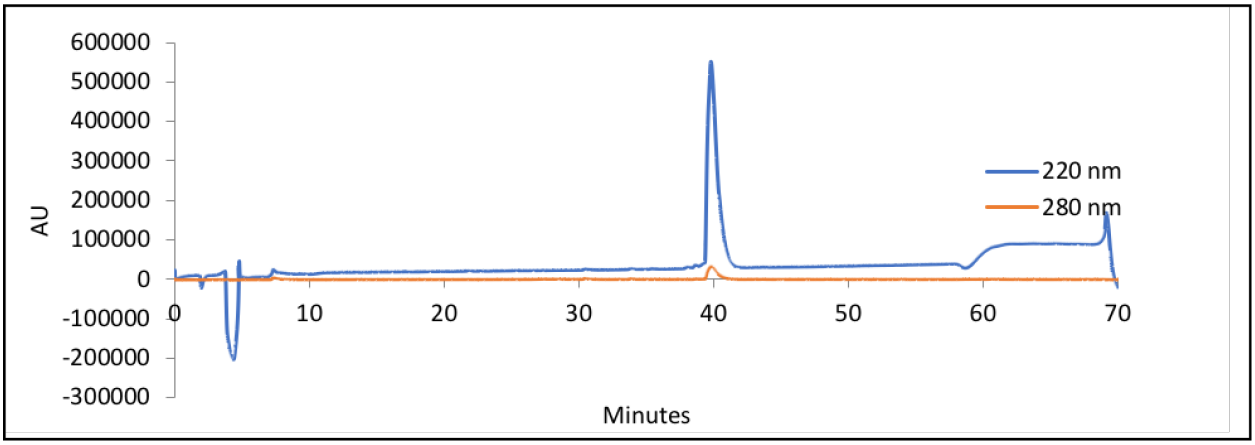


Figure S108. Analytical HPLC data for **3α1-AA** (QX10711). Retention time = 39.858 minutes.

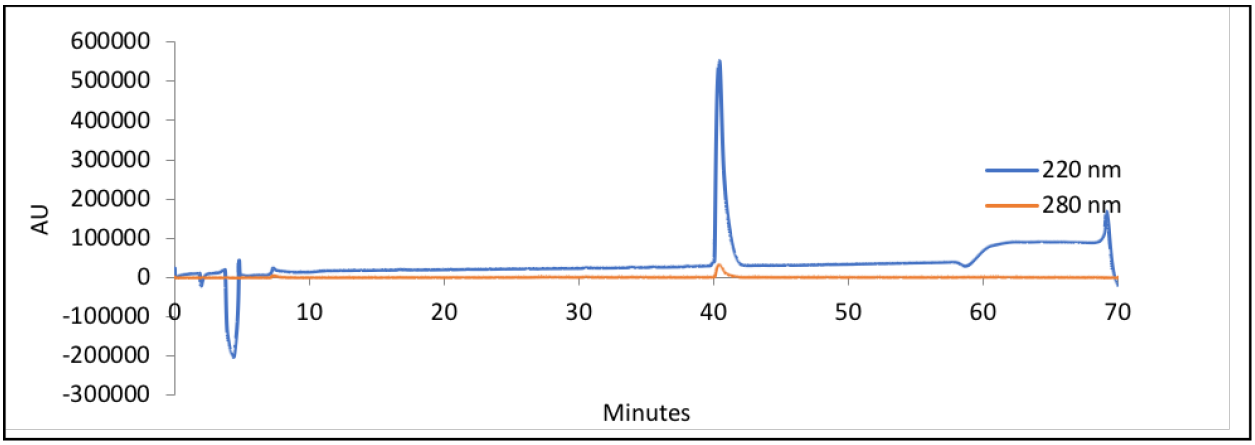


Figure S109. Analytical HPLC data for **p3α1** (QX10718). Retention time = 40.483 minutes.

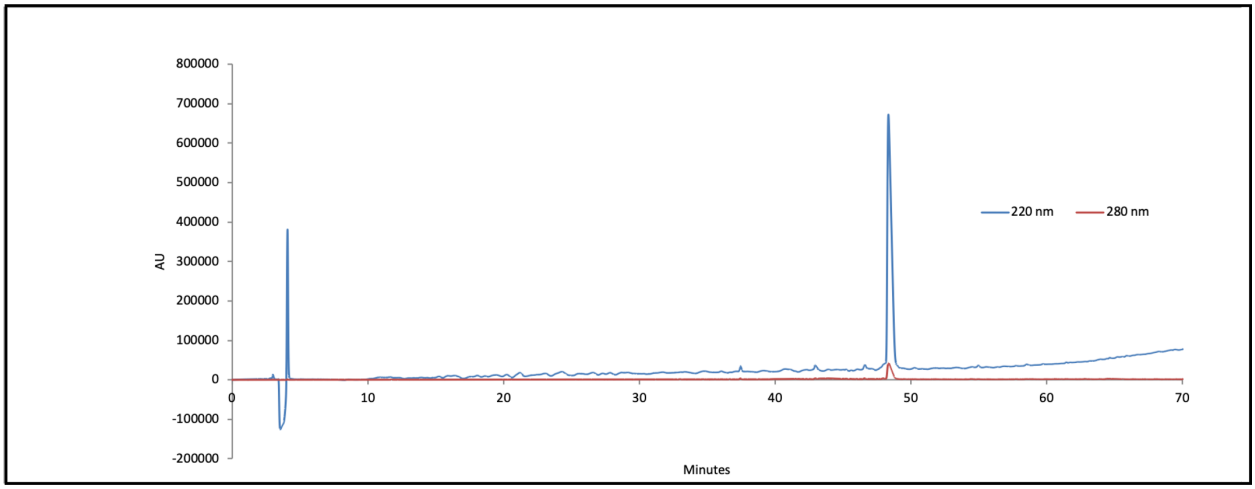


Figure S110. Analytical HPLC data for **p3α1-ER** (QX21354). Retention time = 48.367 minutes.

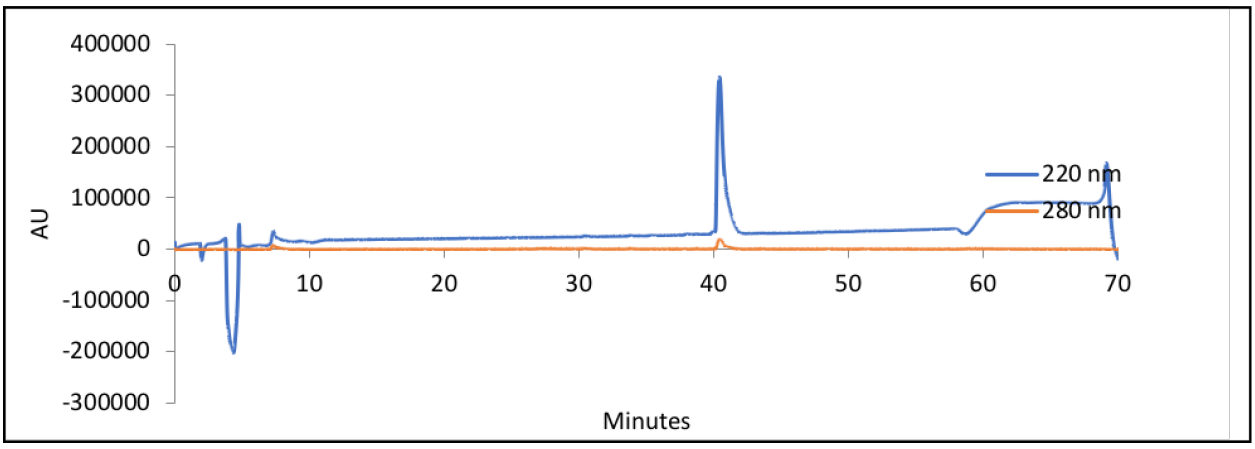


Figure S111. Analytical HPLC data for **p3α1-EA** (QX10717). Retention time = 40.492 minutes.

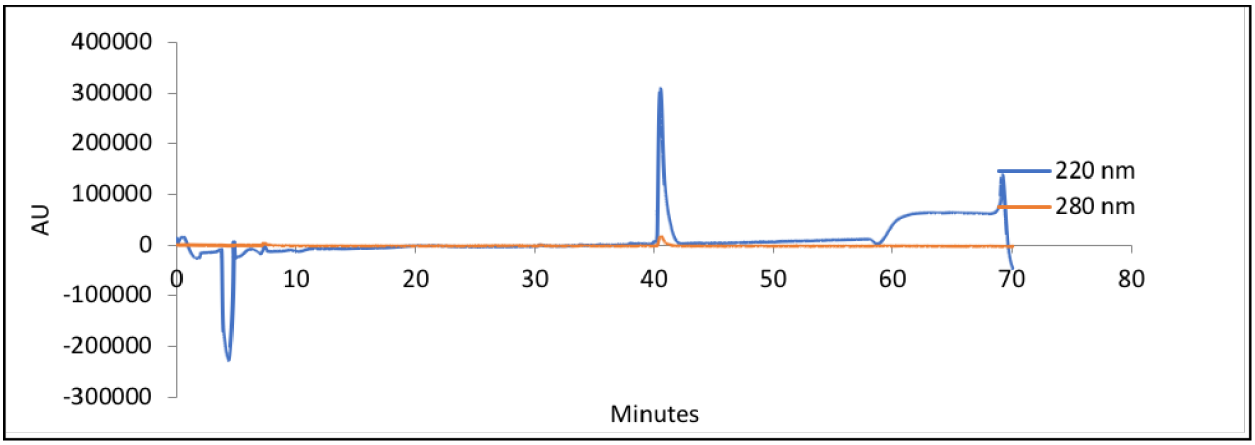


Figure S112. Analytical HPLC data for **p3α1-AK** (QX10716). Retention time = 40.575 minutes.

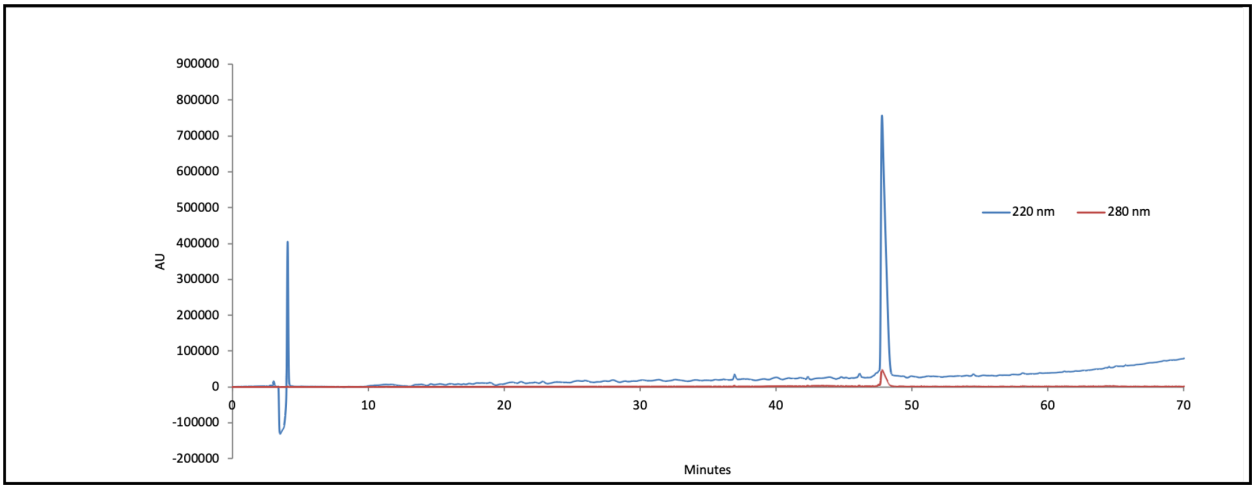


Figure S113. Analytical HPLC data for **p3α1-AR** (QX21353). Retention time = 47.808 minutes.

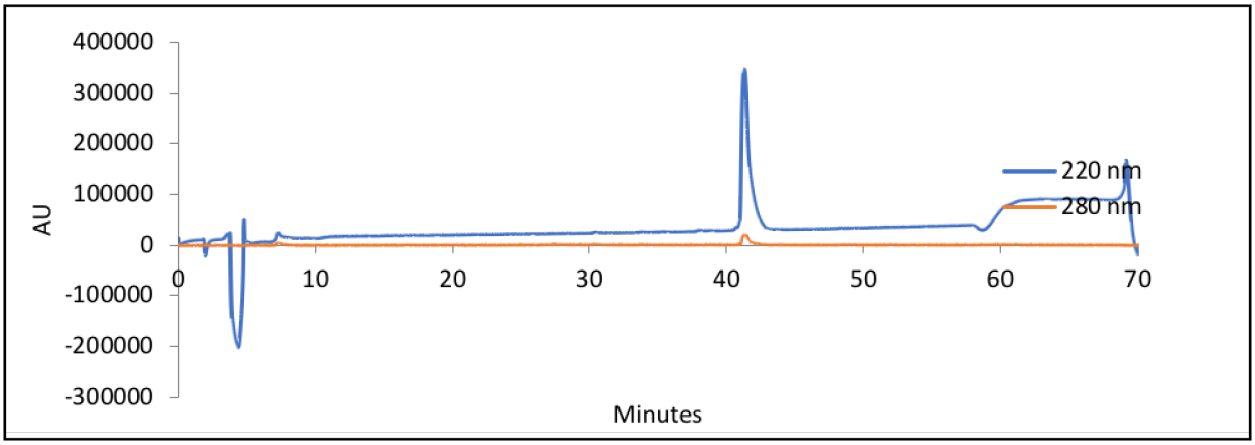


Figure S114. Analytical HPLC data for **p3α1-AA** (QX10715). Retention time = 41.375 minutes.

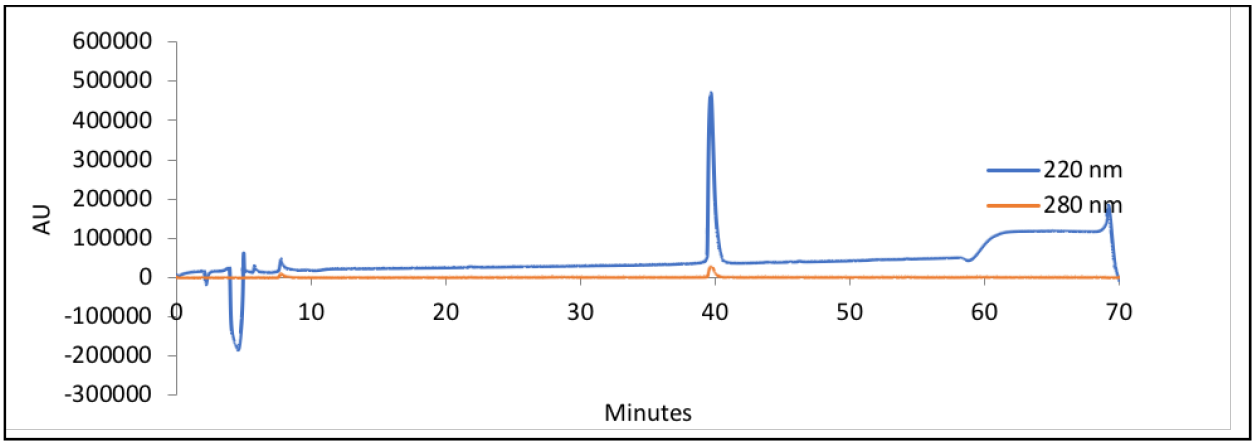


Figure S115. Analytical HPLC data for **3α6** (QX10511). Retention time = 39.725 minutes.

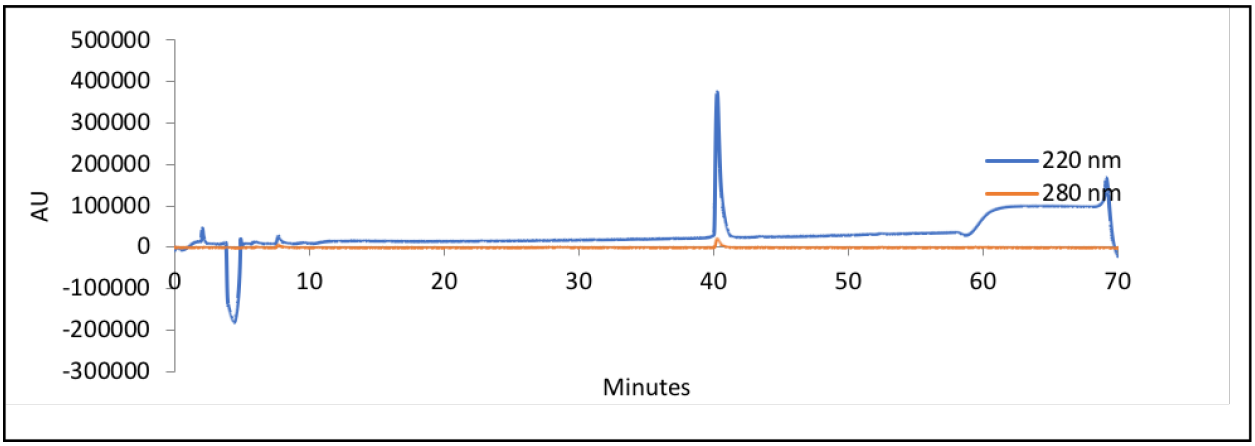


Figure S116. Analytical HPLC data for **3α6-KA** (QX10512). Retention time = 40.317 minutes.

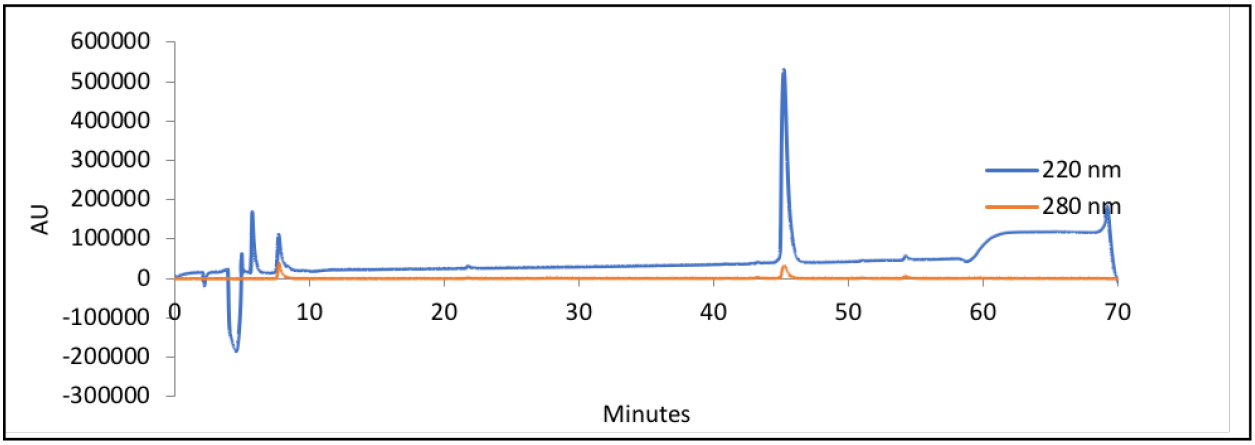


Figure S117. Analytical HPLC data for **3α6-AE** (QX10513). Retention time = 45.183 minutes.

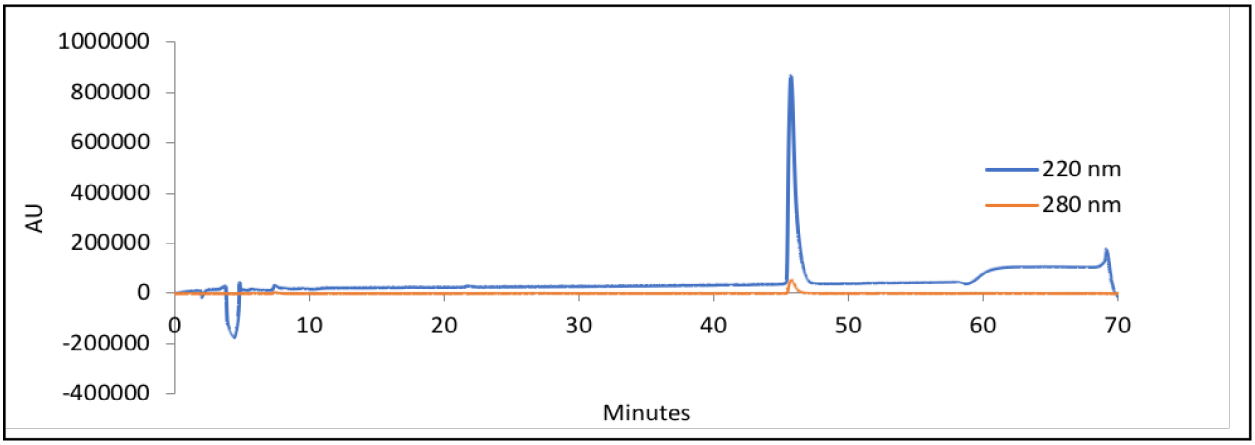


Figure S118. Analytical HPLC data for **3α6-AA** (QX10514). Retention time = 45.808 minutes.

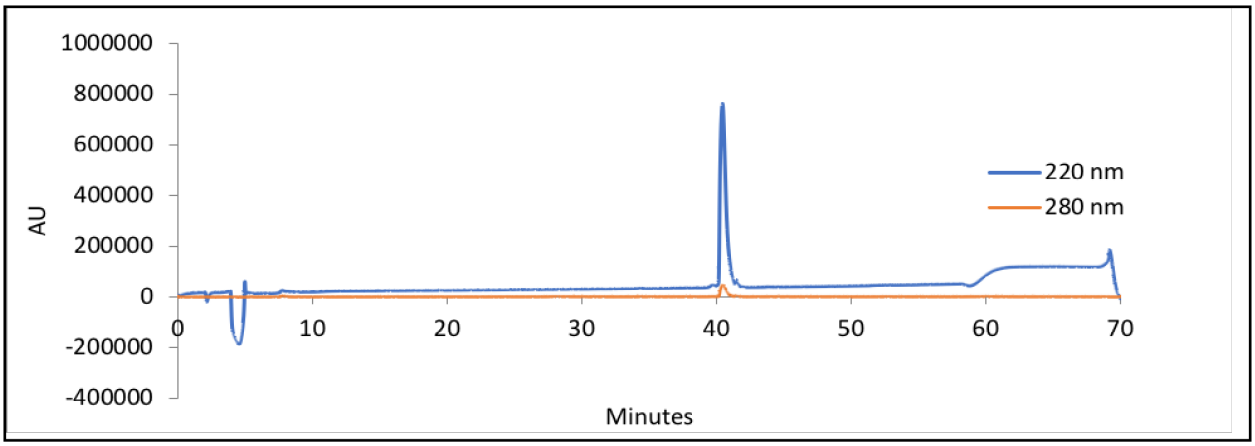


Figure S119. Analytical HPLC data for **p3α6** (QX10515). Retention time = 40.425 minutes.

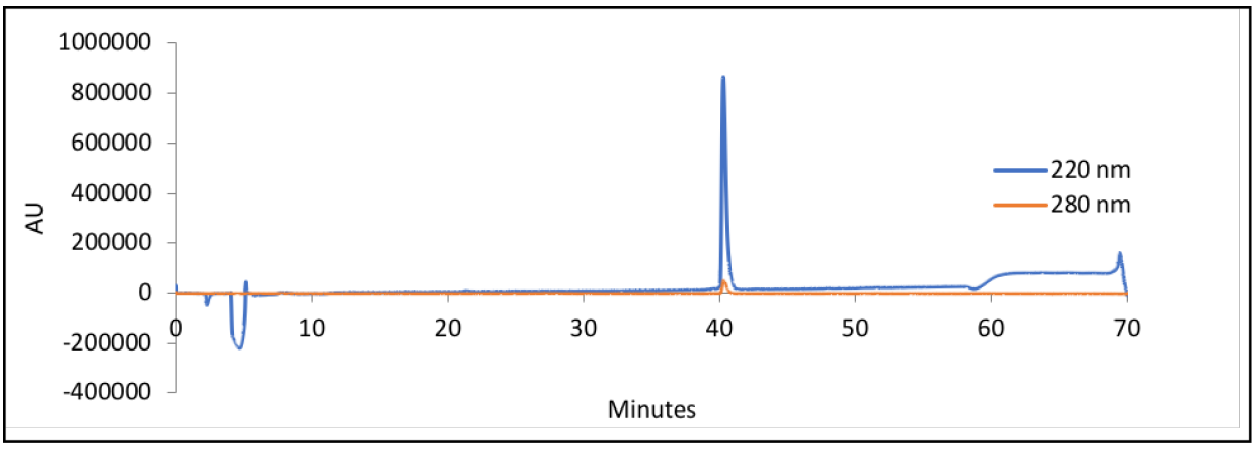


Figure S120. Analytical HPLC data for **p3α6-KA** (QX10516). Retention time = 40.267 minutes.

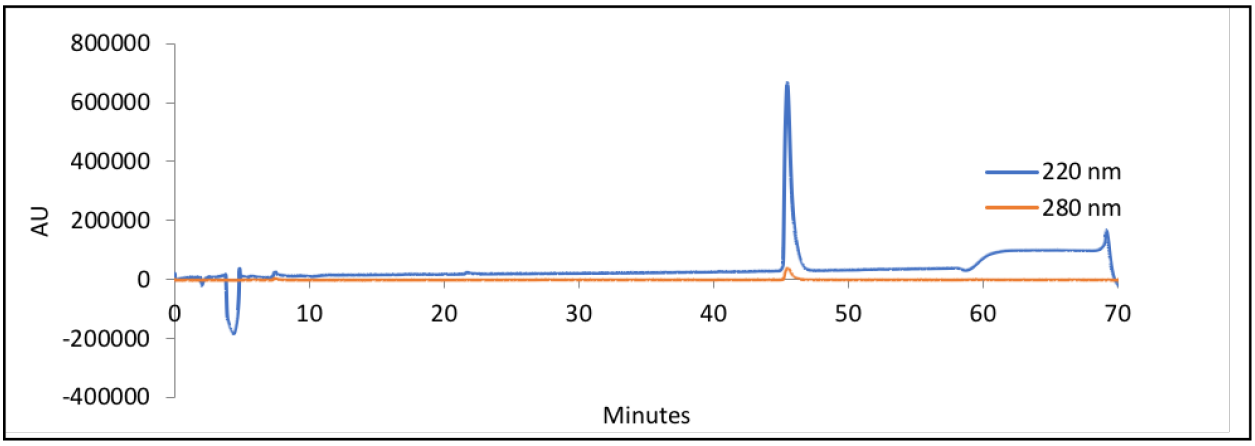


Figure S121. Analytical HPLC data for **p3α6-AE** (QX10517). Retention time = 45.517 minutes.

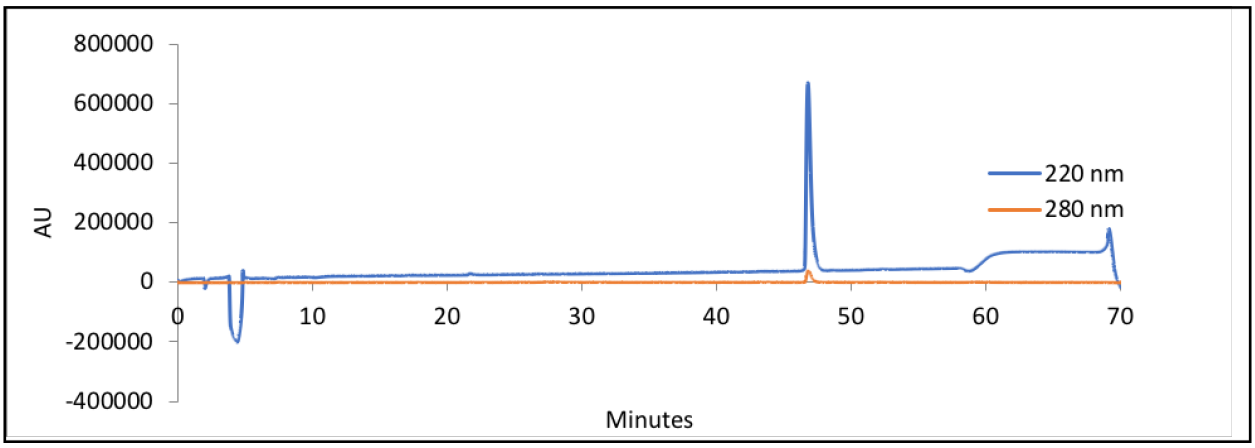


Figure S122. Analytical HPLC data for **p3α6-AA** (QX10518). Retention time = 46.850 minutes.

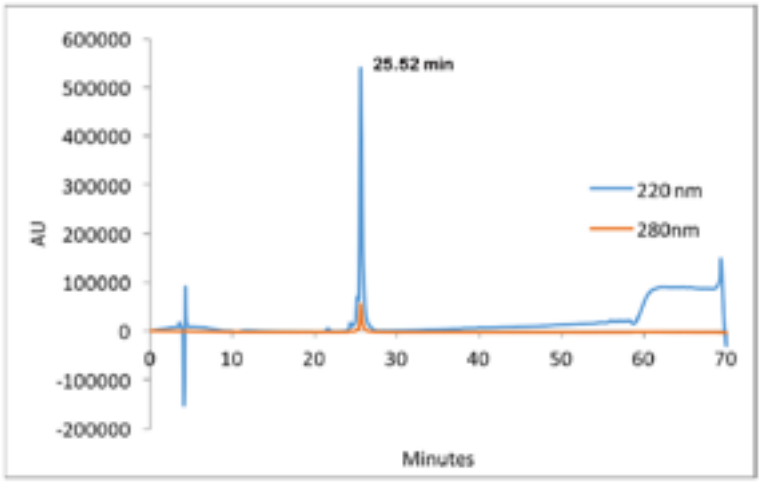


Figure S123. Analytical HPLC data for **β18** (EL1101). Retention time = 25.52 minutes.

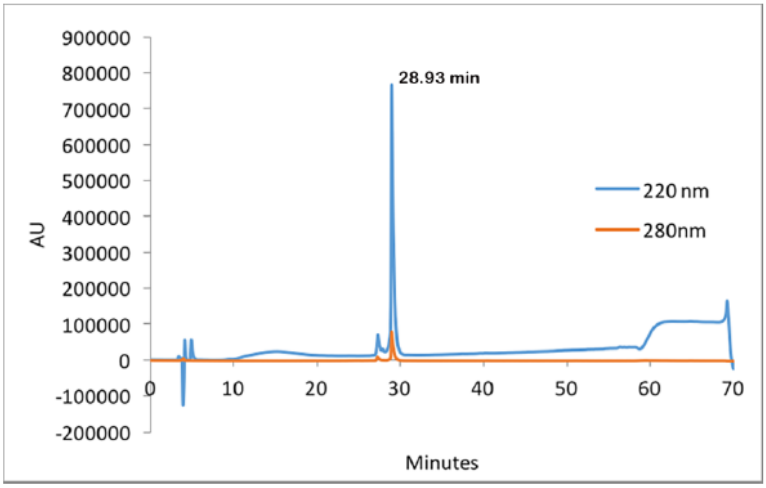


Figure S124. Analytical HPLC data for **β18-DA**. Retention time = 28.93 minutes.

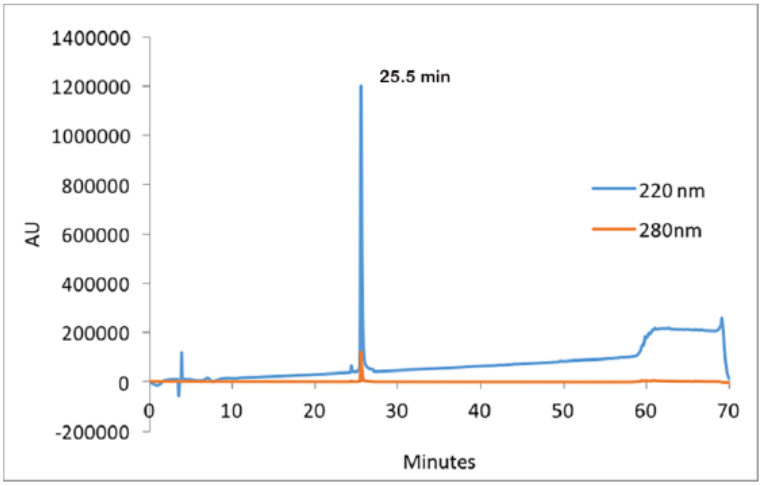


Figure S125. Analytical HPLC data for **β18-SR** (ML1006). Retention time = 25.5 minutes.

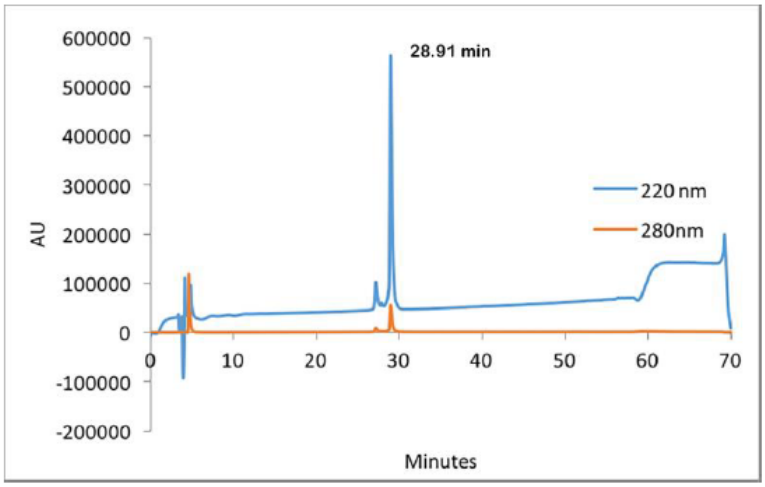


Figure S126. Analytical HPLC data for **β18-SA**. Retention time = 28.91 minutes.

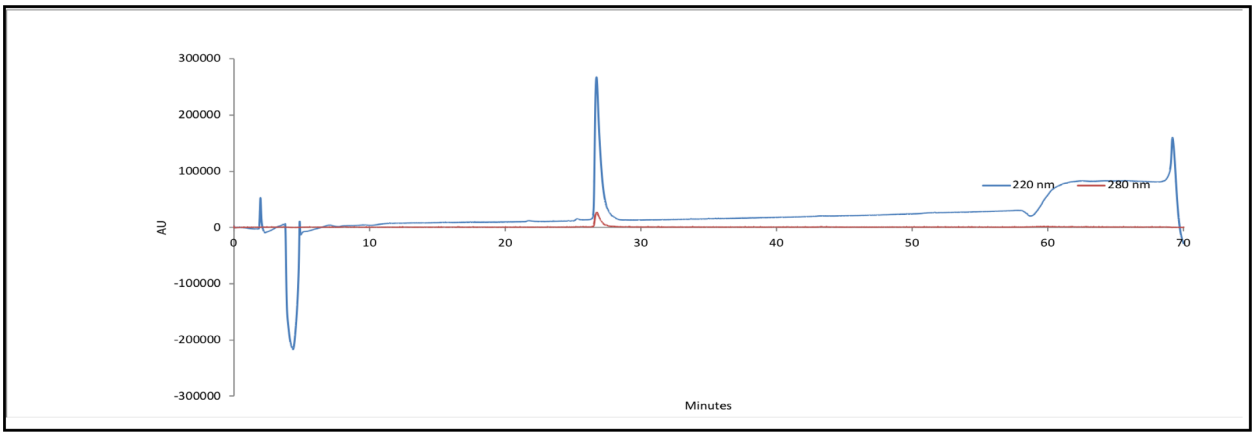


Figure S127. Analytical HPLC data for **pβ18** (QX10492). Retention time = 26.767 minutes.

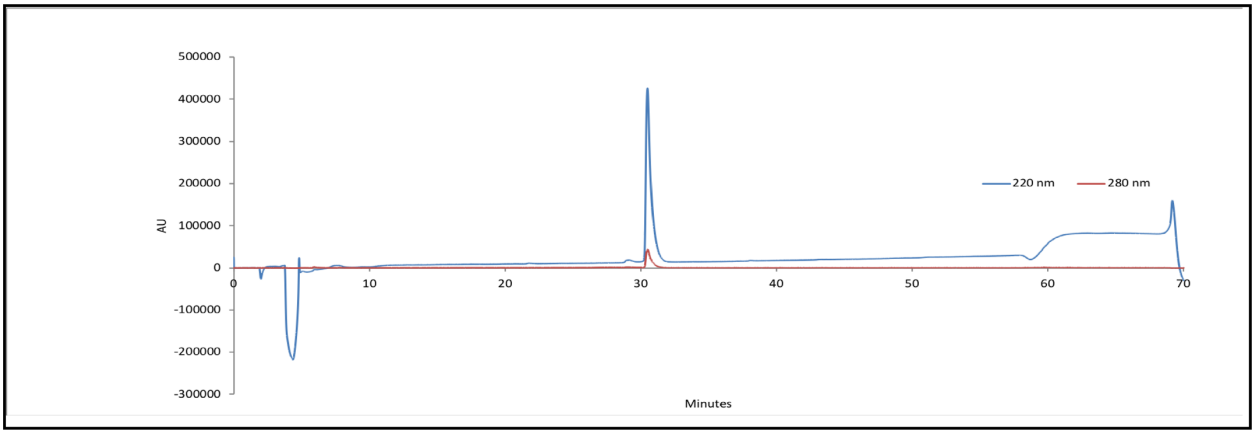


Figure S128. Analytical HPLC data for p**β18-DA** (QX10494). Retention time = 30.533 minutes.

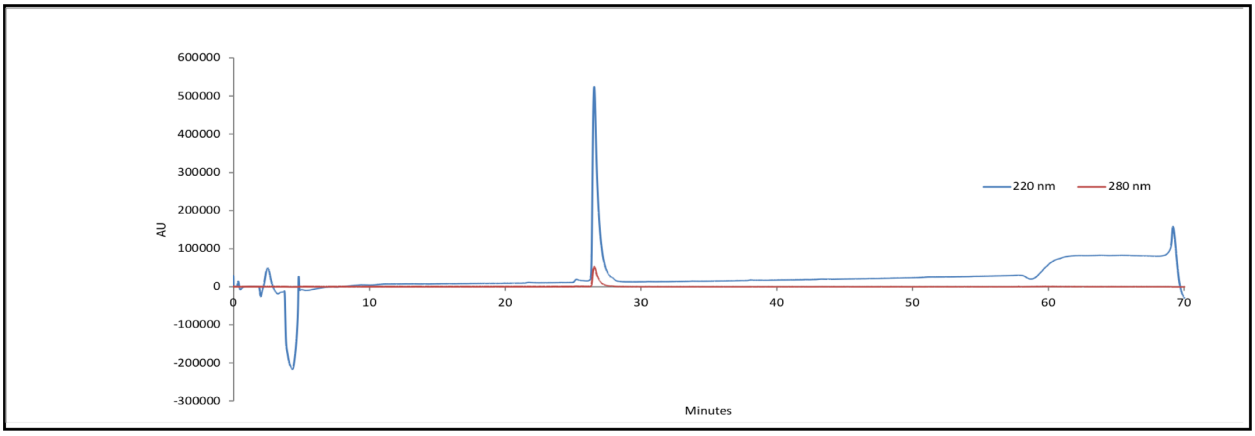


Figure S129. Analytical HPLC data for **pβ18-SA** (QX10491). Retention time = 26.525 minutes.

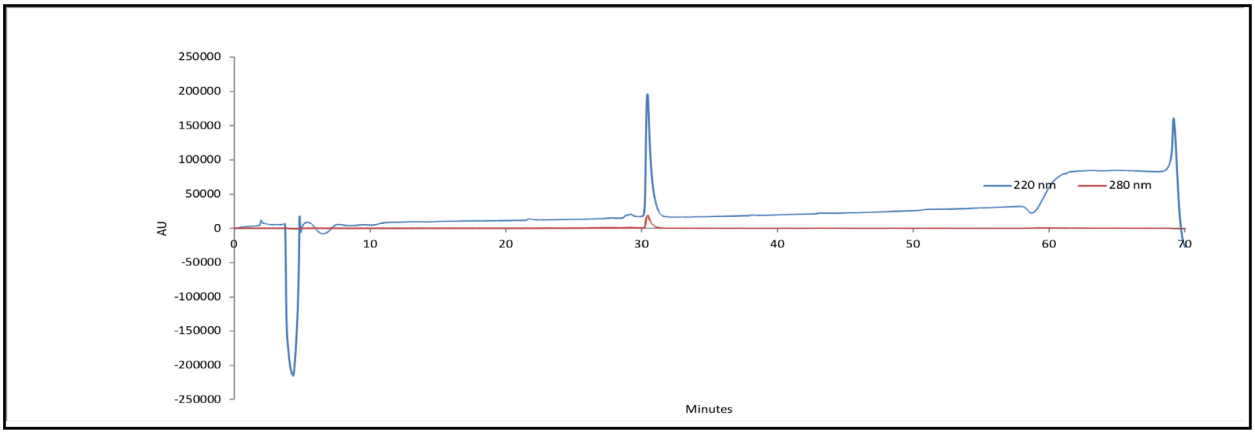


Figure S130. Analytical HPLC data for p**β18-SA** (QX10493). Retention time = 30.458 minutes.

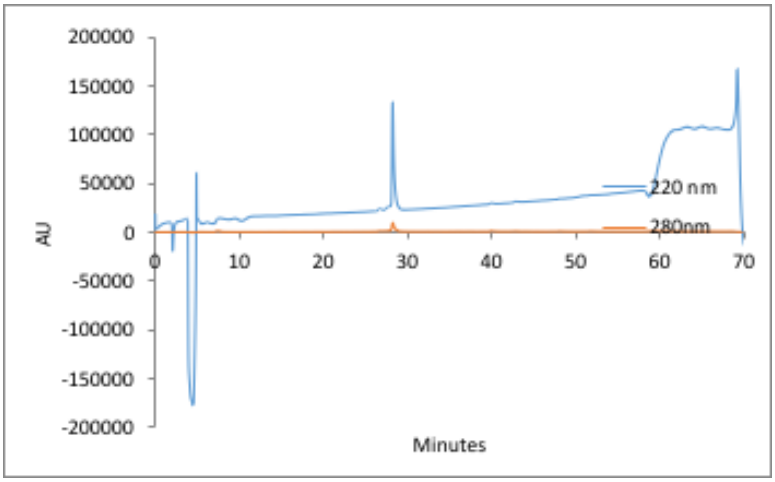


Figure S131. HPLC data for **β23-EA** (SD2006#2).

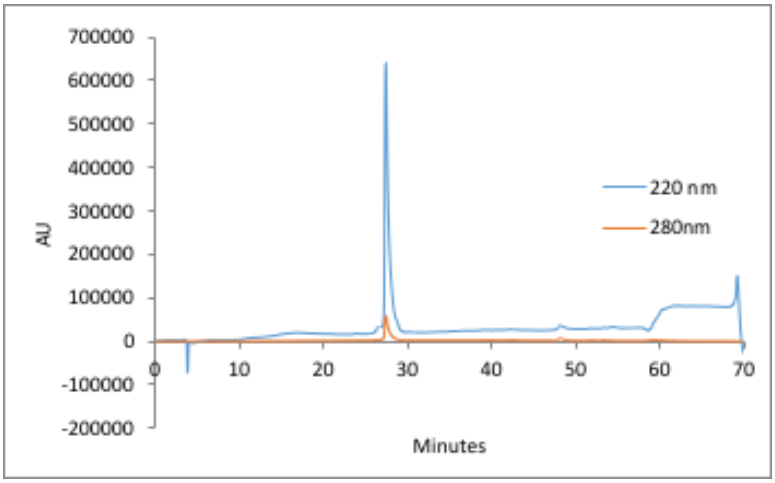


Figure S132. HPLC MS data for **β23-AR** (SD2018).

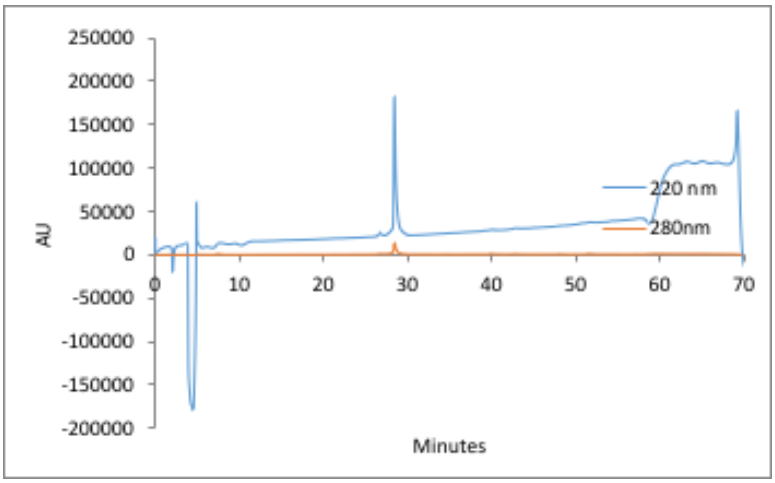


Figure S133. HPLC MS data for **β23-AA** (SD2006#1).

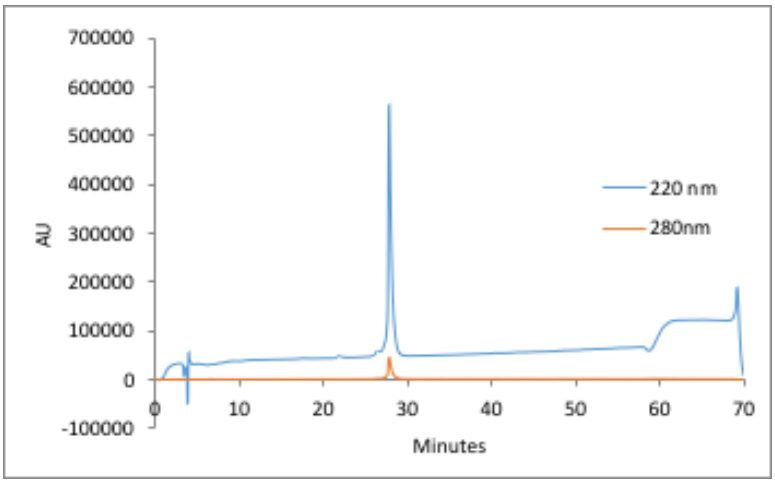


Figure S134. HPLC MS data for **pβ23-EA** (SD2006#2C).

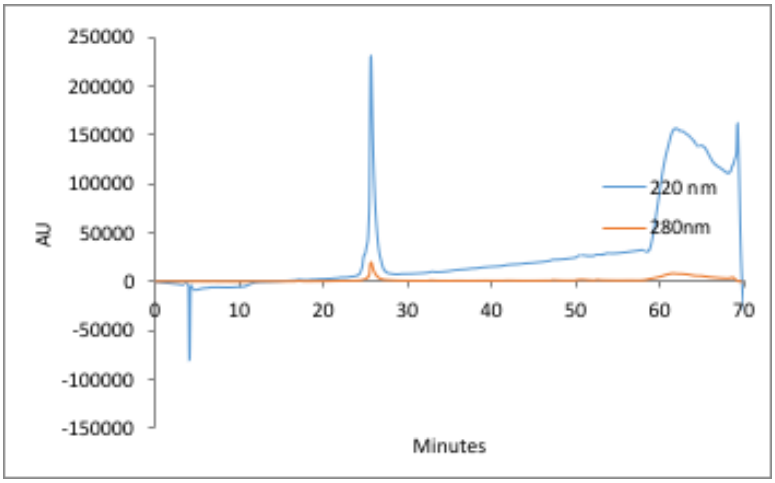


Figure S135. HPLC MS data for **pβ23-AR** (SD2018C).

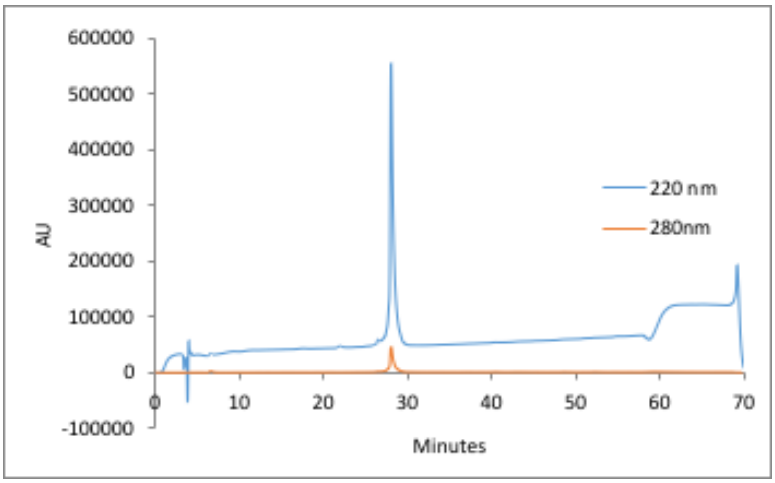


Figure S136. HPLC MS data for **pβ23-AA** (SD2006#1C).

2. Biophysical characterization of peptide variants

Self-association Properties of Peptides: Size Exclusion Chromatography: Previously characterized peptide **1CW** adopts a homotrimeric self-association state in solution, whereas GCN4 adopts a homodimeric self-association state in solution. The peptides explored here (shown in Supplementary Table 1) precluded the use of time- and resource-intensive sedimentation equilibrium experiments to characterize their self-association properties. Consequently, we used the higher throughput size exclusion chromatography to characterize the self-association properties of peptides by comparing their retention times on a size-exclusion column to the retention times of homotrimeric **1CW**, homodimeric **GCN4** and monomeric α-helical **PSBD36**.[5-7]

Size exclusion chromatography (SEC) was done on a Shimadzu HPLC instrument using a Phenomenex yarra 3u sec-3000 column (batches 1 and 2) or a Zenix-C SEC 100 column (batches 3 and 4). The columns were calibrated with internal **1CW**, **GCN4,** and **PSBD36** standards. Previous characterization of **1CW, GCN4,** and **PSBD36** by sedimentation equilibrium analytical ultracentrifugation under analogous buffer conditions demonstrates that **1CW** adopts a trimeric association state; that **GCN4** adopts a dimeric state; and that **PSBD36** is an α-helical monomer.

The retention times derived from SEC experiments on $\boldsymbol{\alpha_3}$ series of peptides are very close to that of trimeric **1CW**, suggesting that these variants likewise adopt a trimeric association state. Similarly, the retention times derived from SEC experiments on $\boldsymbol{\alpha_2}$ series of peptides are close to that of dimeric **GCN4**, suggesting that these variants likewise adopt a dimeric association state. Variants $\boldsymbol{\alpha_2}$**10, p**$\boldsymbol{\alpha_2}$**1** and **p3α1-AR** have retention time between dimer and monomer or dimer and trimer simply because they are in an equilibrium of those two states.

Table S4. Retention times of helical peptides on a Zenix-C SEC 100 column.

Batch 1		
Peptide	**Retention Time**	**Inferred association state**
PSBD36(monomer standard)	12.08	
GCN4/2α21(dimer standard)	10.28	
1CW(trimer standard)	9.41	
2α28	10.38	dimer
2α25	10.35	dimer
2α18	10.18	dimer
2α14	10.32	dimer
2α10	11.55	dimer/monomer
2α7	10.65	dimer
2α6	10.66	dimer
2α4	10.30	dimer
2α3	10.26	dimer
2α1	10.00	dimer
p2α28	10.26	dimer
p2α25	10.31	dimer
p2α21	10.14	dimer
p2α18	10.08	dimer
p2α14	10.08	dimer
p2α10	10.18	dimer
p2α7	10.53	dimer
p2α6	10.66	dimer
p2α4	11.18	dimer
p2α3	10.36	dimer
p2α1	9.98	dimer/trimer
2α4-AA	10.83	dimer
2α4-KA	10.65	dimer
2α4-AE	10.31	dimer
p2α4-AA	10.66	dimer
p2α4-KA	10.60	dimer
p2α4-AE	10.19	dimer
2α18-AR	11.29	dimer
2α18-EA	10.47	dimer
2α18-AA	10.88	dimer
p2α18-AR	11.04	dimer
p2α18-EA	10.48	dimer
p2α18-AA	10.91	dimer
3α6	9.65	trimer
3α6-KA	9.74	trimer
3α6-AE	9.54	trimer
3α6-AA	9.70	trimer
p3α6	9.71	trimer
p3α6-KA	9.81	trimer
p3α6-AE	9.48	trimer
p3α6-AA	9.68	trimer
3α1-EA	9.66	trimer
3α1	9.72	trimer
p3α1-EA	9.74	trimer
p3α1	9.87	trimer

Batch 2		
Peptide	**Retention Time**	**Inferred association state**
GCN4/2α21(dimer standard)	12.05	
p2α4	11.84	dimer
3α1-AR	10.74	trimer
3α1-ER	10.08	trimer
p3α1-AR	11.21	trimer/dimer
p3α1-ER	10.37	trimer
3α1-AA	10.26	trimer
3α1-AK	10.29	trimer
p3α1-AA	10.48	trimer
p3α1-AK	10.55	trimer

Circular Dichroism Spectropolarimetry: Measurements were made with an Aviv 420 Circular Dichroism Spectropolarimeter, using quartz cuvettes with a path length of 0.1 cm. Protein solutions were prepared in 20 mM sodium phosphate buffer, pH 7, and protein concentrations were determined spectroscopically based on tyrosine and tryptophan absorbance at 280 nm in 6 M guanidine hydrochloride + 20 mM sodium phosphate (ε_{Trp} = 5690 $M^{-1}cm^{-1}$, ε_{Tyr} = 1280 $M^{-1}cm^{-1}$).[8] CD spectra of 30 μM solutions were obtained from 260 to 200 nm at 25°C. Variable temperature CD data were obtained at least in triplicate by monitoring the molar ellipticity [θ] at 222 nm of 30 μM solutions of each α-helical variant and at 227 nm of 50 μM solutions of each β-sheet variant in 20 mM sodium phosphate (pH 7) from 1 to 95 °C at 2 °C intervals, with 120 s equilibration time between data points and 30 s averaging time.

Triplicate variable temperature CD data for each peptide were fit globally to a two-state model for thermally-induced unfolding. This approach treats the observed [θ] of a peptide solution at a given temperature as the average of the [θ] values for the folded state and the unfolded ensemble, weighted according to their relative concentrations at that temperature, as shown in the following equation:

$$[\theta] = (u_o + u_o T)(1 - F_{folded}) + (f_o + f_1 T)(F_{folded}) \quad \text{(S1)}$$

In equation S1, T is the temperature in Kelvin; u_o and u_1 are the intercept and slope of the pre-transition baseline (which represents the linear dependence of the unfolded ensemble CD signal [θ] on temperature); f_o and f_1 are the intercept and slope of the pre-transition baseline (which represents the linear dependence of the folded state CD signal [θ] on temperature); and F_{folded} is the fraction of the total protein concentration that is folded as at temperature T.

F_{fit} is a function of the folding equilibrium constant; its precise form depends on whether or not the associate state of the protein changes upon folding. Folding of the GCN4-p1 variants listed in Table S1 involves association of two unfolded monomers **M** into a folded dimer **D** with temperature-dependent equilibrium constant **K** as defined below:

$$2\mathbf{M} \rightleftharpoons \mathbf{D};\ \ \mathbf{K} = \frac{[\mathbf{D}]}{[\mathbf{M}]^2} \tag{S2}$$

The constant total concentration of peptide in solution **P** is defined by the equation S3:

$$\mathrm{P} = [\mathbf{M}] + 2[\mathbf{D}] = [\mathbf{M}] + 2\mathbf{K}[\mathbf{M}]^2 \tag{S3}$$

The positive root of this quadratic equation provides an expression for [**M**] as a function of **P** and **K**:

$$[\mathbf{M}] = \frac{\sqrt{1+8\mathbf{KP}}-1}{4\boldsymbol{K}} \tag{S4}$$

Substitution of [**M**] into the definition of F_{folded} gives the following expression for the monomer-dimer equilibrium:

$$\mathrm{F}_{\mathrm{folded}} = \frac{2\mathbf{K}[\mathbf{M}]^2}{\mathbf{P}} = 1 + \frac{1}{4\mathbf{KP}} - \sqrt{\frac{1}{16\mathbf{K}^2\mathbf{P}^2} - \frac{1}{2\mathbf{KP}}} \tag{S5}$$

Folding of the 1CW variants listed in Table S2 involves association of three unfolded monomers **M** into a folded trimer **Tri** with temperature-dependent equilibrium constant **K** as defined below:

$$3\mathbf{M} \rightleftharpoons \mathbf{Tri};\ \ \mathbf{K} = \frac{[\mathbf{Tri}]}{[\mathbf{M}]^3} \tag{S6}$$

The constant total concentration of peptide in solution **P** is defined by equation S7:

$$\mathrm{P} = [\mathbf{M}] + 3[\mathbf{D}] = [\mathbf{M}] + 3\mathbf{K}[\mathbf{M}]^3 \tag{S7}$$

Rearranging equation S7 results in the following polynomial equation that is cubic in [**M**]:

$$0 = [\mathbf{M}]^3 + \frac{[\mathbf{M}]}{3\mathbf{K}} - \frac{\mathbf{P}}{3\mathbf{K}} \tag{S8}$$

Using Mathematica, we found the three roots of this polynomial, two of which are complex, whereas the third is real. The real root of equation S8 provides an expression for [**M**] as a function of **P** and **K**:

$$[\mathbf{M}] = \left(\frac{\mathbf{P}}{6\mathbf{K}} + \left(\frac{1}{729\mathbf{K}^3} + \frac{\mathbf{P}^2}{36\mathbf{K}^2}\right)^{\frac{1}{2}}\right)^{\frac{1}{3}} - \frac{1}{9\mathbf{K}\left(\frac{\mathbf{P}}{6\mathbf{K}} + \left(\frac{1}{729\mathbf{K}^3} + \frac{\mathbf{P}^2}{36\mathbf{K}^2}\right)^{\frac{1}{2}}\right)^{\frac{1}{3}}} \tag{S9}$$

Substitution of [**M**] into the definition of F_{folded} gives the following expression for the monomer-trimer equilibrium:

$$\mathrm{F}_{\mathrm{folded}} = \frac{3\mathbf{K}[\mathbf{M}]^3}{\mathbf{P}} \tag{S10}$$

Folding of the WW variants listed in Table S3 involves an equilibrium between an unfolded monomer (**U**) and a folded monomer (**F**) temperature-dependent equilibrium constant **K** as defined below:

$$\mathbf{U} \rightleftharpoons \mathbf{F};\ \ \mathbf{K} = \frac{[\mathbf{F}]}{[\mathrm{U}]} \tag{S11}$$

The constant total concentration of peptide in solution **P** is defined by equation S11:

$$\mathrm{P} = [\mathbf{U}] + [\mathbf{F}] = [\mathbf{U}] + \mathbf{K}[\mathbf{U}] \tag{S12}$$

F_{folded} of the monomer folding equilibrium is defined as follows:

$$\mathrm{F_{folded}} = \frac{\mathbf{K}}{1+\mathbf{K}} \tag{S13}$$

In each of these cases, **K** is related to the change in free energy upon folding (ΔG_f):

$$\mathbf{K} = \mathrm{e}^{-\frac{\Delta G_f}{RT}} \tag{S14}$$

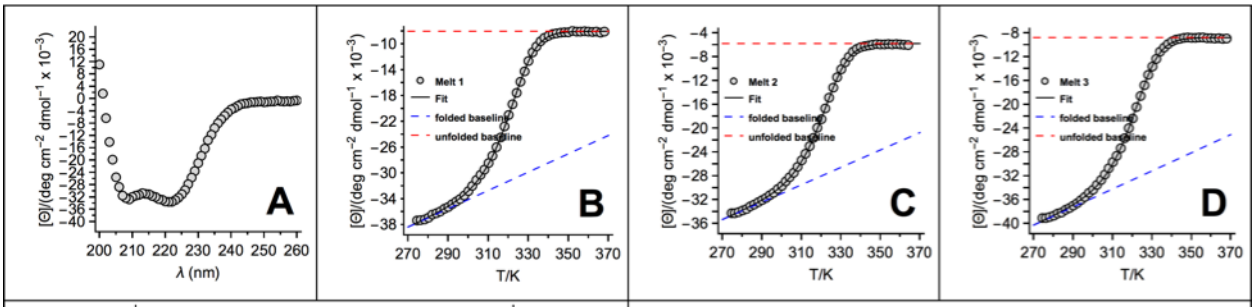
In turn, the temperature-dependence of $\mathbf{\Delta G_f}$ for the dimer or trimer can be expressed as a second order polynomial:

$$\Delta G_f = \Delta G_o + \Delta G_1(T - T_o) + \Delta G_2(T - T_o)^2 \tag{S15}$$

where $\mathbf{\Delta G_0}$, $\mathbf{\Delta G_1}$ and $\mathbf{\Delta G_2}$ are parameters to be determined via least-squares regression (though ΔG_2 is excluded when its standard error is too high), and T_0 is an arbitrary reference temperature that should be close to the melting temperature. We used this expression for the GCN4-p1 and 1CW variants, though many of the 1CW variants did not require the use of ΔG_2. For the WW variants, we used the following expression for the temperature-dependence of ΔG_f, which is a function of folding enthalpy at the melting temperature $\Delta H_{(Tm)}$, folding heat capacity ΔC_p, and the melting temperature T_m (i.e., the temperature at which $F_{folded} = 0.5$ and $\Delta G_f = 0$ kcal/mol):

$$\Delta G_f = \frac{\Delta H_{(T_m)} \cdot (T_m - T)}{T_m} + \Delta C_p \cdot \left(T - T_m - T \cdot \ln\left[\frac{T}{T_m}\right]\right) \tag{S16}$$

We used least-squares regression to fit the variable temperature CD for each variant to these equations. Far-UV CD spectra and variable temperature CD data for these compounds are shown below in Figures S137-S200, along with the parameters of the fits (and their standard errors and p-values) and fit statistics (including R^2 and sum of the squared residuals). For the monomer-dimer and monomer-trimer equilibria, the melting temperature T_m (defined as the temperature at which $F_{folded} = 0.5$) is not a parameter of the fit. In these cases, we used Mathematica to solve for T_m numerically.

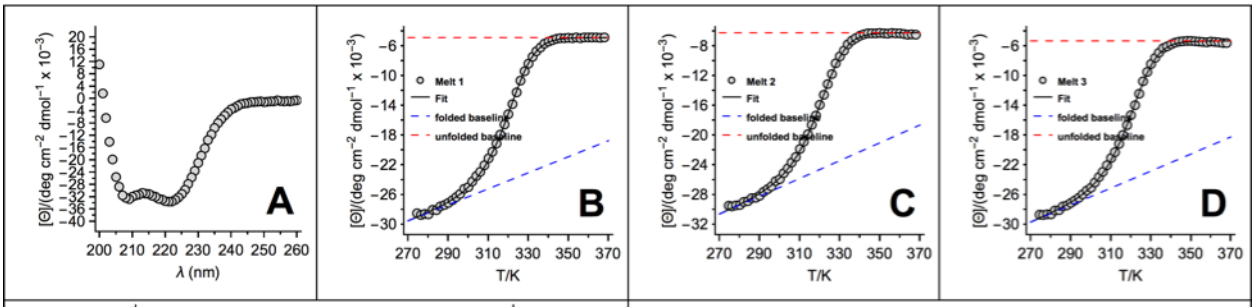


Parameters	Values	Units	P–Values
ΔG_0	−7.076 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1207 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−76.7 ± 1.17	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.14 ± 0.0041	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−8.03 ± 0.036	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−74.8 ± 1.14	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.15 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.8 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−81.3 ± 1.19	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.15 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−8.79 ± 0.036	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 2.62894

For **2α1**, at 318.5 K,
ΔG_f = −7.08 ± 0.02 kcal/mol

Figure S137. CD data spectra for **2α1** (QX108111).

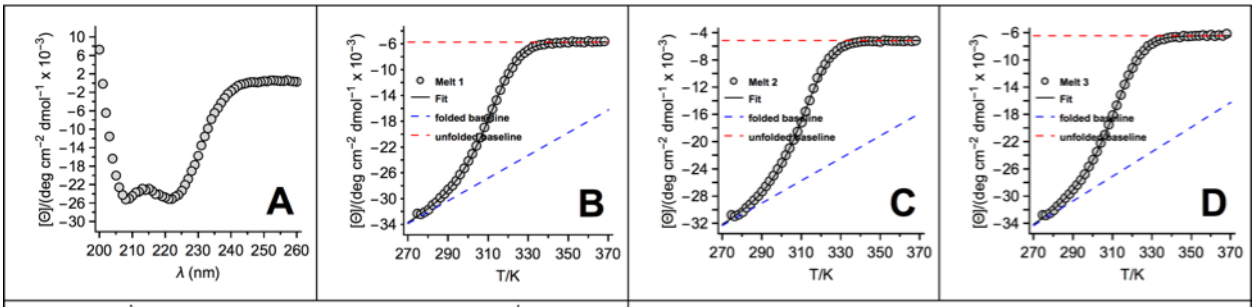


Parameters	Values	Units	P–Values
ΔG_0	−6.923 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1176 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−58.7 ± 1.43	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.88 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−63. ± 1.39	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.12 ± 0.0049	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−6.231 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−60.6 ± 1.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.33 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 3.44482

For **p2α1**, at 318.5 K,
ΔG_f = −6.92 ± 0.02 kcal/mol

Figure S138. CD data for **p2α1** (QX108111p).

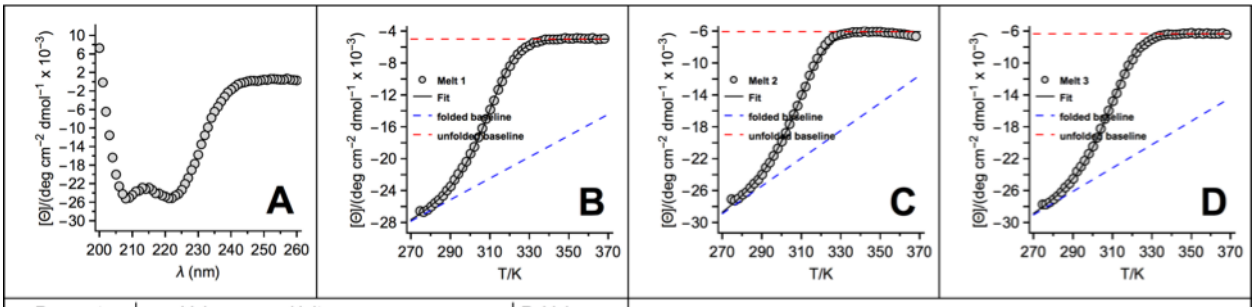


Parameters	Values	Units	P–Values
ΔG_0	−5.831 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.09999 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−81.4 ± 2.15	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.18 ± 0.0077	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.71 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−76.8 ± 2.11	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.16 ± 0.0076	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.132 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−83.1 ± 2.11	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.18 ± 0.008	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.43 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 2.50006

For **2α3**, at 318.5 K,
ΔG_f = −5.83 ± 0.02 kcal/mol

Figure S139. CD data for **2α3** (QX108110).

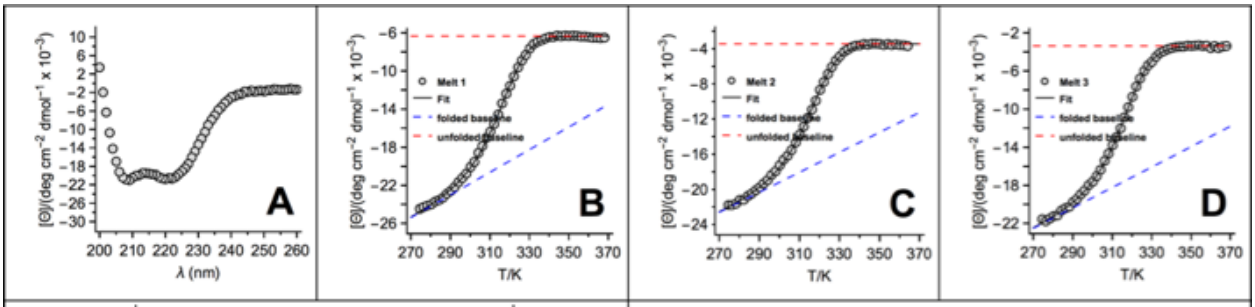


Parameters	Values	Units	P–Values
ΔG_0	−5.597 ± 0.03	kcal/mol/K	<0.001
ΔG_1	0.09958 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−64. ± 3.3	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.13 ± 0.012	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.98 ± 0.042	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−75.7 ± 3.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.17 ± 0.011	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−6.056 ± 0.041	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−68.6 ± 3.19	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.15 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.33 ± 0.041	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99987
sum residuals^2 = 4.42731

For **p2α3**, at 318.5 K,
ΔG_f = −5.60 ± 0.03 kcal/mol

Figure S140. CD data for **p2α3** (QX108110p).

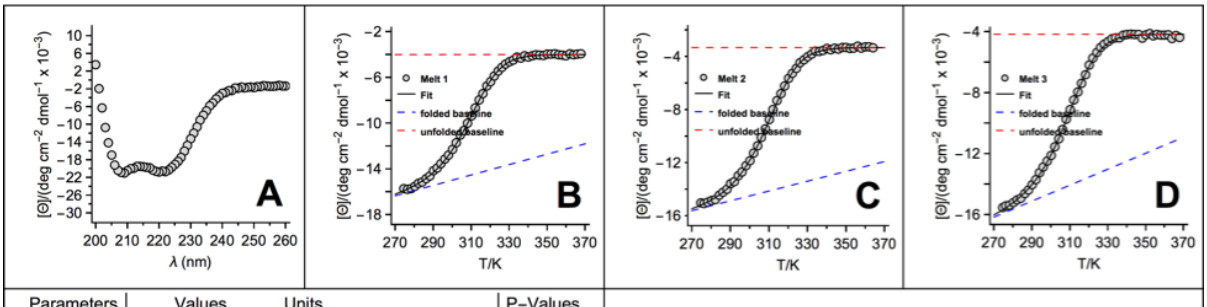


Parameters	Values	Units	P–Values
ΔG_0	−6.392 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.108 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−57.4 ± 1.36	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.12 ± 0.0048	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−6.32 ± 0.029	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−53.2 ± 1.39	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0049	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.435 ± 0.031	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−51.4 ± 1.41	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−3.36 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 1.95073

For **2α4**, at 318.5 K,
ΔG_f = −6.39 ± 0.02 kcal/mol

Figure S141. CD data for **2α4** (QX10819).

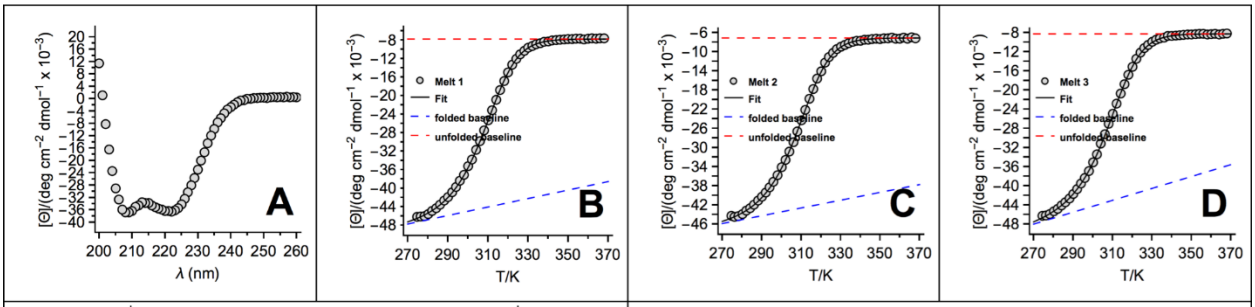


Parameters	Values	Units	P–Values
ΔG_0	−5.701 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.08794 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−28.6 ± 1.51	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.045 ± 0.0055	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4. ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−25.6 ± 1.55	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.037 ± 0.0056	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.322 ± 0.021	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−30.3 ± 1.43	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.052 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−4.17 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 0.89897

For **p2α4**, at 318.5 K,
ΔG_f = −5.70 ± 0.02 kcal/mol

Figure S142. CD data for **p2α4** (QX10819p).

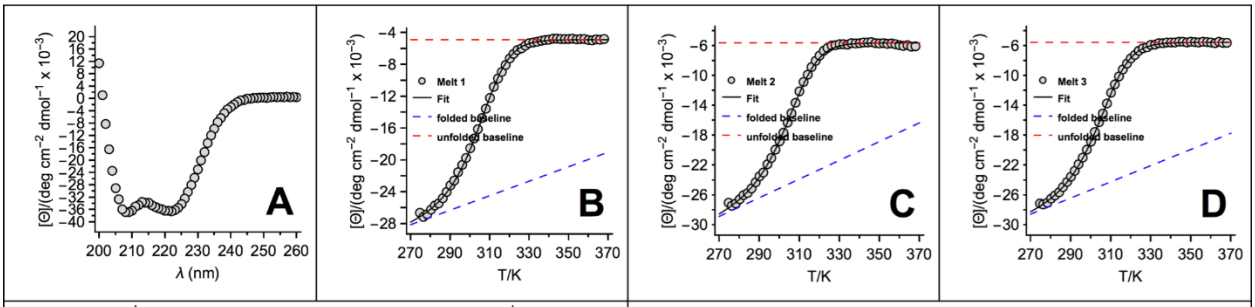


Parameters	Values	Units	P–Values
ΔG_0	−5.602 ± 0.01	kcal/mol/K	<0.001
ΔG_1	0.09023 ± 0.0008	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−72.5 ± 2.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.092 ± 0.009	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−7.76 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−67.9 ± 2.45	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.081 ± 0.0089	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−7.134 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−81.6 ± 2.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.12 ± 0.009	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−8.27 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 2.45584

For **2α6**, at 318.5 K,
ΔG_f = −5.60 ± 0.01 kcal/mol

Figure S143. CD data for **2α6** (QX10818).

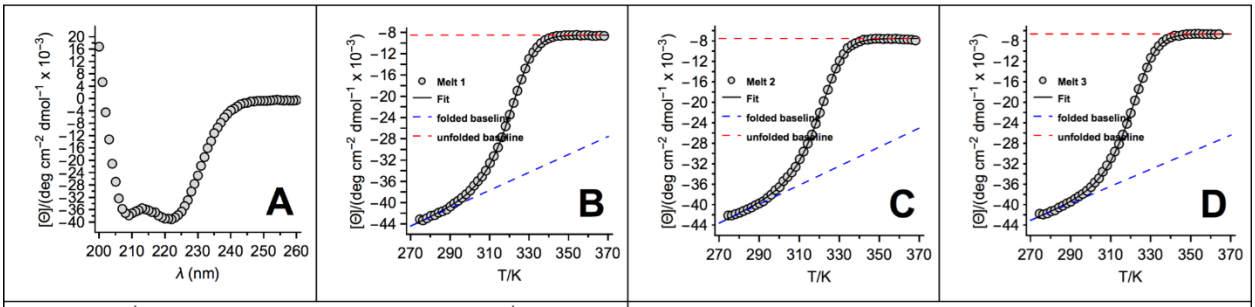


Parameters	Values	Units	P–Values
ΔG_0	−5.138 ± 0.03	kcal/mol/K	<0.001
ΔG_1	0.09523 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−52.7 ± 4.18	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.091 ± 0.015	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.9 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−62.7 ± 3.94	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.13 ± 0.014	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.606 ± 0.039	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−57.8 ± 4.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.54 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99986
sum residuals^2 = 4.33770

For **p2α6**, at 318.5 K,
ΔG_f = −5.14 ± 0.03 kcal/mol

Figure S144. CD data for **p2α6** (QX10818p).

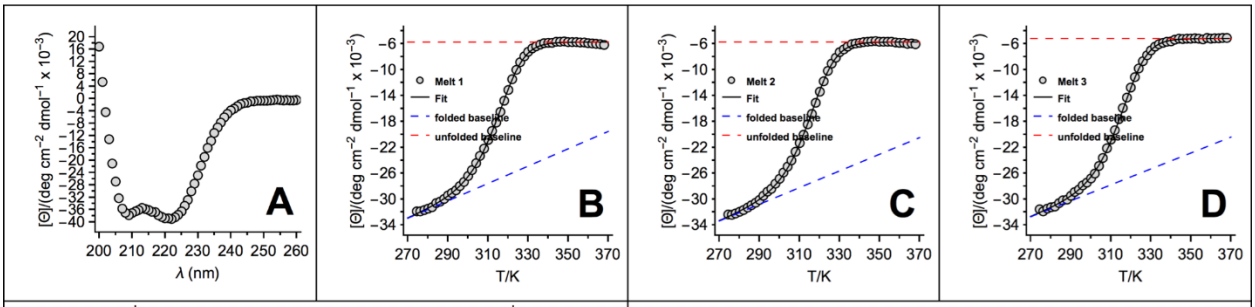


Parameters	Values	Units	P–Values
ΔG_0	−6.998 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1279 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−89.8 ± 1.3	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.17 ± 0.0046	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−8.47 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−93.8 ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.19 ± 0.0045	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−7.502 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−88. ± 1.34	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.17 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.61 ± 0.042	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 3.42470

For **2α7**, at 318.5 K,
ΔG_f = −7.00 ± 0.02 kcal/mol

Figure S145. CD data for **2α7** (QX10817).

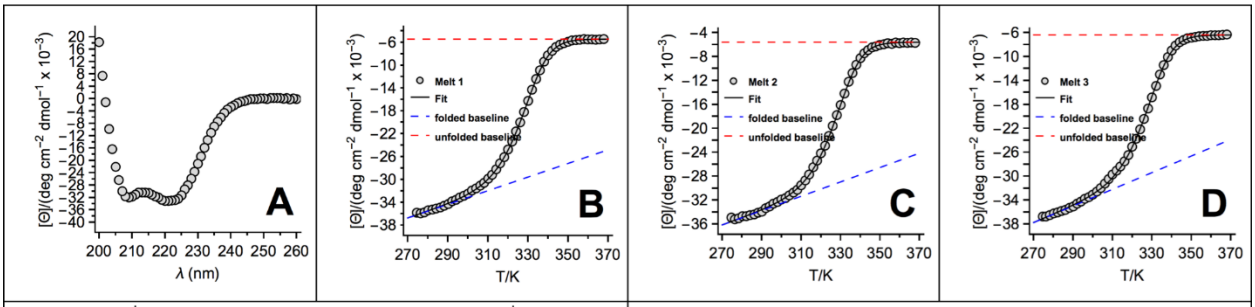


Parameters	Values	Units	P–Values
ΔG_0	−6.272 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1172 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−69.1 ± 1.76	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.13 ± 0.0062	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.74 ± 0.039	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−68.1 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.13 ± 0.0064	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.728 ± 0.039	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−66. ± 1.81	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.12 ± 0.006	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.19 ± 0.039	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 3.64259

For **p2α7**, at 318.5 K,
ΔG_f = −6.27 ± 0.02 kcal/mol

Figure S146. CD data for **p2α7** (QX10817p).

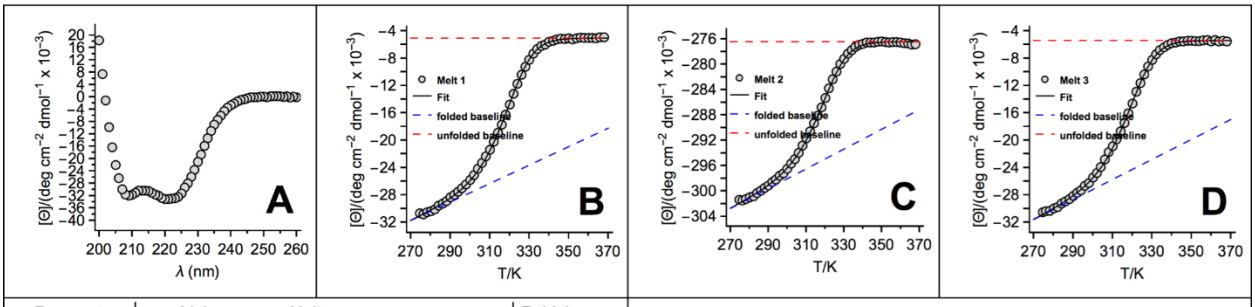


Parameters	Values	Units	P–Values
ΔG_0	−8.059 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1252 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−68.9 ± 0.956	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.12 ± 0.0034	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.44 ± 0.044	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−68.5 ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.12 ± 0.0033	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.596 ± 0.044	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−75.3 ± 0.951	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.14 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.39 ± 0.043	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 3.18641

For **2α10**, at 318.5 K,
ΔG_f = −8.06 ± 0.02 kcal/mol

Figure S147. CD data for **2α10** (QX10816).

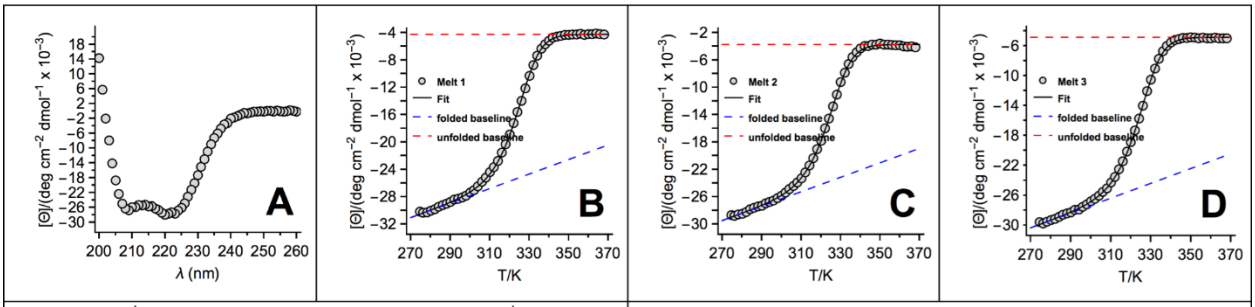


Parameters	Values	Units	P–Values
ΔG_0	−6.724 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1111 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−68.2 ± 1.52	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.13 ± 0.0054	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.07 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−345. ± 1.45	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.16 ± 0.0051	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−276.4 ± 0.037	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−71.2 ± 1.47	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.15 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.4 ± 0.037	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999992
sum residuals^2 = 3.01748

For **p2α10**, at 318.5 K,
ΔG_f = −6.72 ± 0.02 kcal/mol

Figure S148. CD data for **p2α10** (QX10816p).

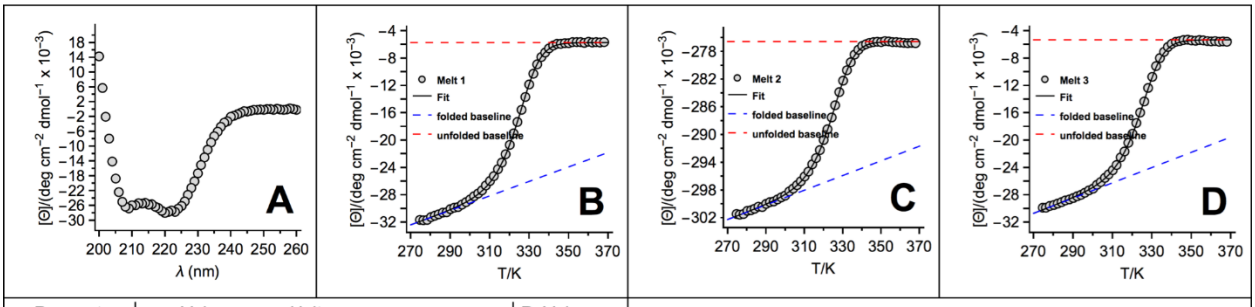


Parameters	Values	Units	P–Values
ΔG_0	−7.648 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1414 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−59.7 ± 0.899	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.0032	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.26 ± 0.035	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−58. ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0031	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.732 ± 0.035	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−57.1 ± 0.899	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.099 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−4.85 ± 0.035	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 2.56337

For **2*α*14**, at 318.5 K,
ΔG_f = −7.65 ± 0.02 kcal/mol

Figure S149. CD data for **2*α*14** (QX10815).

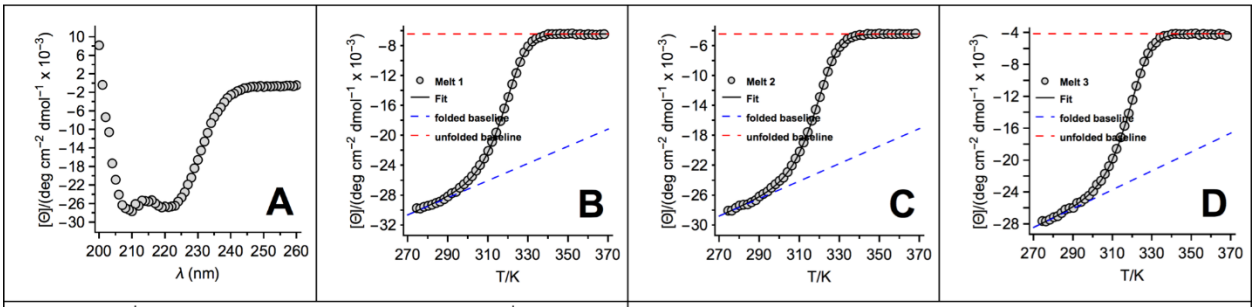


Parameters	Values	Units	P–Values
ΔG_0	−7.719 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1457 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−61. ± 0.86	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.71 ± 0.034	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−331. ± 0.838	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0029	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−276.6 ± 0.033	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−60.8 ± 0.825	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.32 ± 0.033	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999994
sum residuals^2 = 2.31694

For **p2*α*14**, at 318.5 K,
ΔG_f = −7.72 ± 0.02 kcal/mol

Figure S150. CD data for **p2*α*14** (QX10815p).

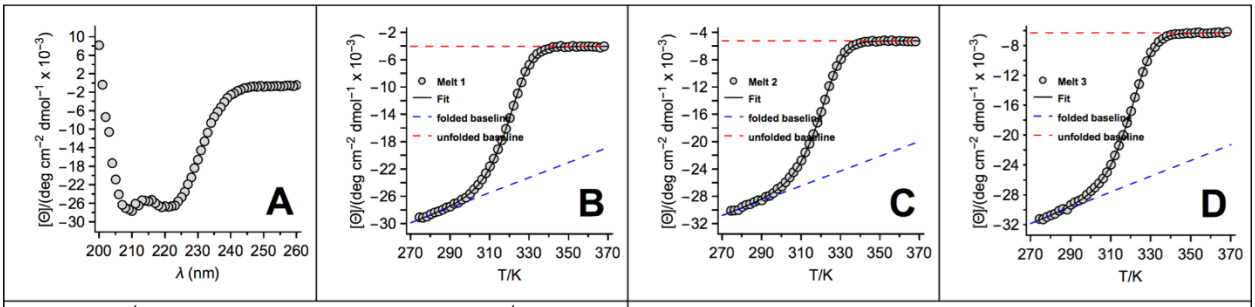


Parameters	Values	Units	P–Values
ΔG_0	−6.672 ± 0.01	kcal/mol/K	<0.001
ΔG_1	0.142 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−61.6 ± 0.918	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.0032	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−6.42 ± 0.025	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−60.4 ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.12 ± 0.0032	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−4.419 ± 0.025	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−60.4 ± 0.914	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.12 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−4.14 ± 0.025	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 1.60121

For **2α18**, at 318.5 K,
ΔG_f = −6.67 ± 0.01 kcal/mol

Figure S151. CD data for **2α18** (QX10814).

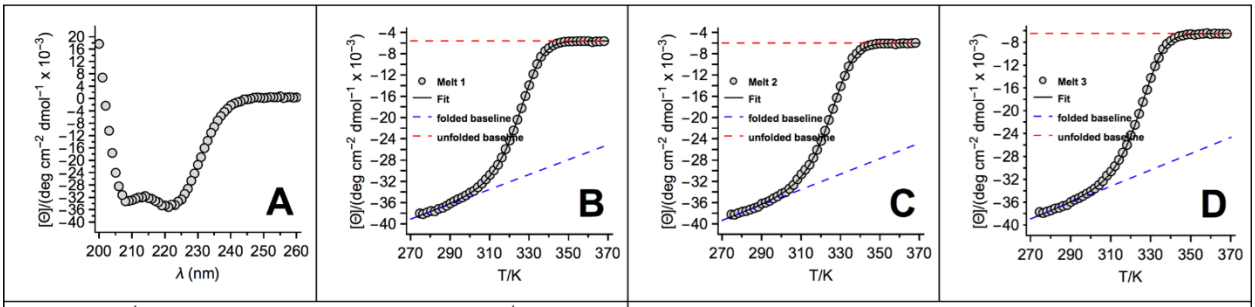


Parameters	Values	Units	P–Values
ΔG_0	−6.899 ± 0.01	kcal/mol/K	<0.001
ΔG_1	0.1378 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−59.7 ± 0.765	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.0027	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.02 ± 0.023	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−60.1 ± 0.761	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0027	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.207 ± 0.023	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−60.3 ± 0.763	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.27 ± 0.023	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999766
sum residuals^2 = 1.22577

For **p2α18**, at 318.5 K,
ΔG_f = −6.90 ± 0.01 kcal/mol

Figure S152. CD data for **p2α18** (QX10814p).

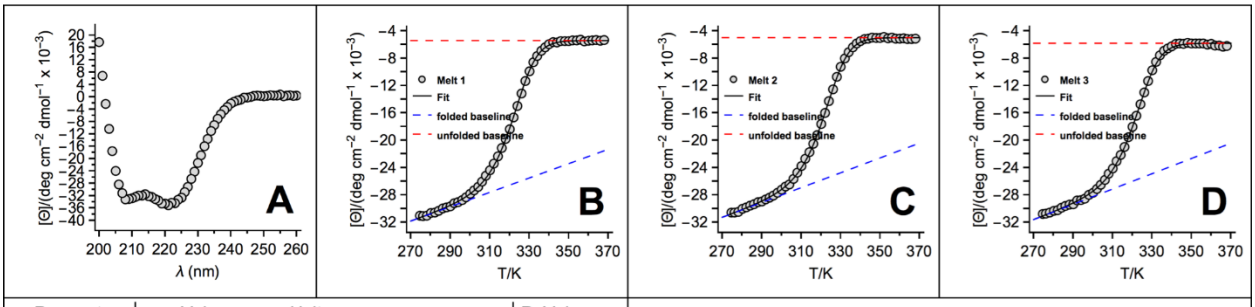


Parameters	Values	Units	P–Values
ΔG_0	−7.748 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1379 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−76.8 ± 0.948	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.14 ± 0.0033	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.56 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−78.5 ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.15 ± 0.0033	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−5.961 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−77.4 ± 0.933	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.14 ± 0.003	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−6.45 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 2.85341

For **2α21**, at 318.5 K,
ΔG_f = −7.75 ± 0.02 kcal/mol

Figure S153. CD data for **2α21** (QX10813).

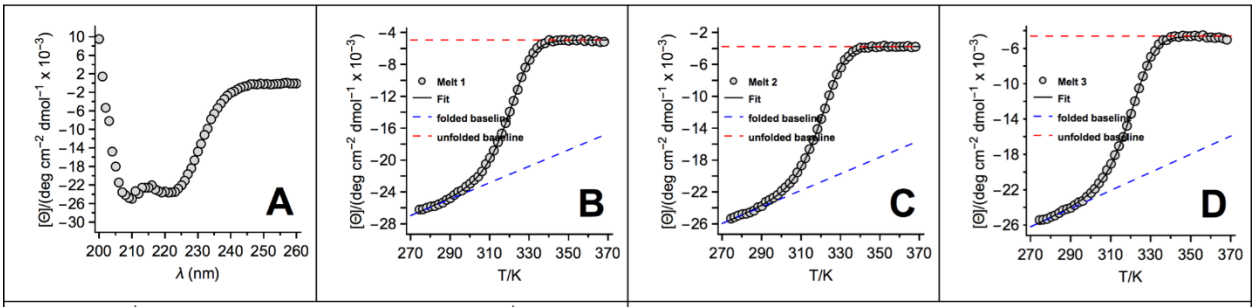


Parameters	Values	Units	P–Values
ΔG_0	−7.269 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1348 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−60.2 ± 1.23	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.1 ± 0.0043	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−5.42 ± 0.041	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−60.6 ± 1.22	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0042	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−4.999 ± 0.041	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−61.8 ± 1.19	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.11 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.82 ± 0.041	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999367
sum residuals^2 = 3.65509

For **p2α21**, at 318.5 K,
ΔG_f = −7.27 ± 0.02 kcal/mol

Figure S154. CD data for **p2α21** (QX10813p).

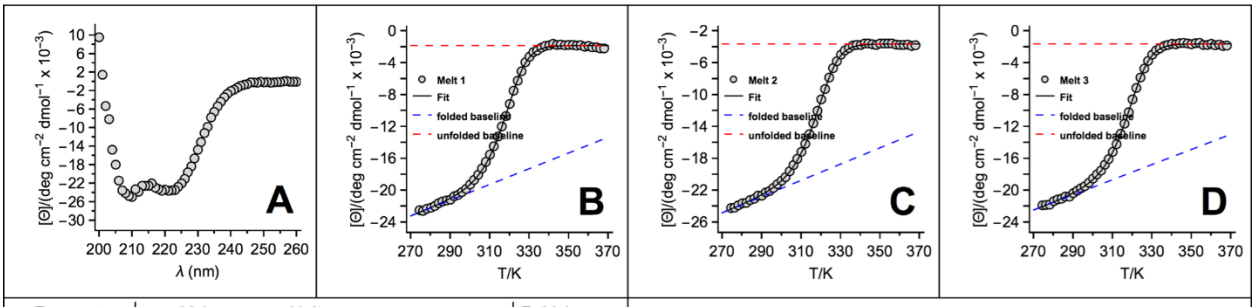


Parameters	Values	Units	P–Values
ΔG_0	−6.97 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1354 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−54.7 ± 1.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.1 ± 0.0036	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.93 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−54. ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.1 ± 0.0036	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.751 ± 0.032	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−53.9 ± 1.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.1 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−4.6 ± 0.031	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99994
sum residuals^2 = 2.27945

For **2α25**, at 318.5 K,
ΔG_f = −6.97 ± 0.02 kcal/mol

Figure S155. Cd data for **2α25** (QX10812).

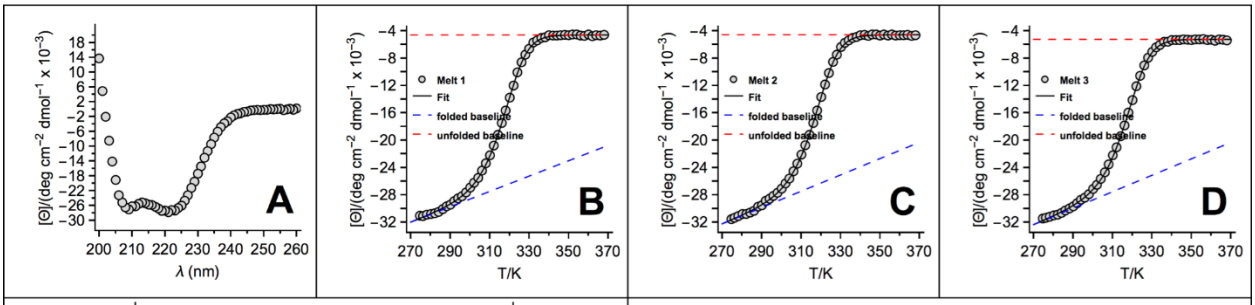


Parameters	Values	Units	P–Values
ΔG_0	−6.625 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1423 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−49.9 ± 1.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.099 ± 0.0037	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−1.85 ± 0.029	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−52.3 ± 1.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.1 ± 0.0037	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.645 ± 0.029	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−48.1 ± 1.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.095 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−1.63 ± 0.029	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999245
sum residuals^2 = 2.08064

For **p2α25**, at 318.5 K,
ΔG_f = −6.62 ± 0.02 kcal/mol

Figure S156. CD data for **p2α25** (QX10812p).

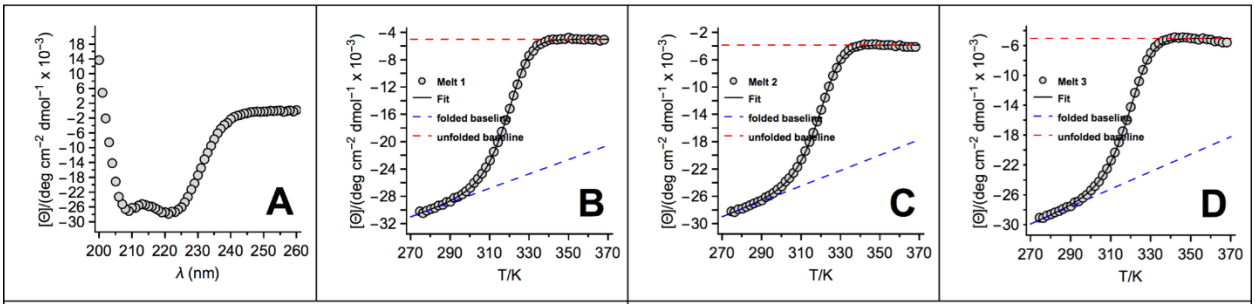


Parameters	Values	Units	P–Values
ΔG_0	−6.534 ± 0.01	kcal/mol/K	<0.001
ΔG_1	0.1343 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−62.3 ± 1.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.11 ± 0.0037	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.6 ± 0.027	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−64.5 ± a2se	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.12 ± 0.0037	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−4.575 ± 0.027	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−64.8 ± 1.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.12 ± 0.004	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.25 ± 0.027	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 1.82012

For **2α28**, at 318.5 K,
ΔG_f = −6.53 ± 0.01 kcal/mol

Figure S157. CD data for **2α28** (QX10811).

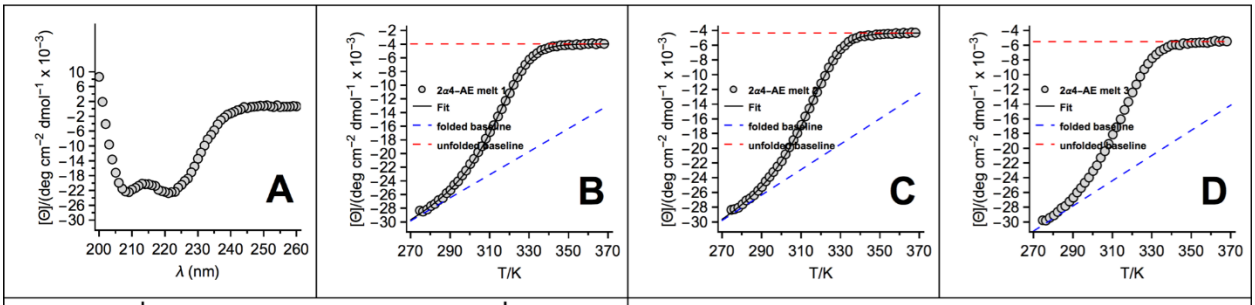


Parameters	Values	Units	P–Values
ΔG_0	−6.787 ± 0.02	kcal/mol/K	<0.001
ΔG_1	0.1409 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−59.3 ± 1.36	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.1 ± 0.0047	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c1	−4.99 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−59.5 ± 1.31	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.11 ± 0.0046	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c2	−3.83 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d20	---	---	---
a3	−61.4 ± 1.29	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.12 ± 0.005	deg cm^{-2} dmol^{-1} x 10^{-3} K^{-1}	<0.001
c3	−5.01 ± 0.038	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.9999267
sum residuals^2 = 3.52003

For **p2α28**, at 318.5 K,
ΔG_f = −6.79 ± 0.02 kcal/mol

Figure S158. CD data for **p2α28** (QX10811p).

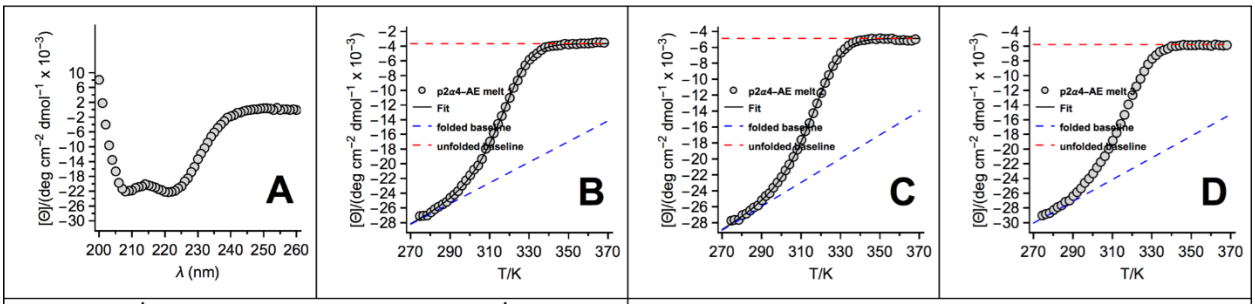


Parameters	Values	Units	P–Values
ΔG_0	−6.74 ± 0.03	kcal/mol	<0.001
ΔG_1	0.089 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−75.4 ± 1.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.169 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.9 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−76.4 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.173 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.3 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−77.4 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.171 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.5 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 1.91027

For **2α4–AE**, at 314.7 K,
ΔG_f = −6.74 ± 0.03 kcal/mol

Figure S159. CD data for **2α4-AE** (QX11193).

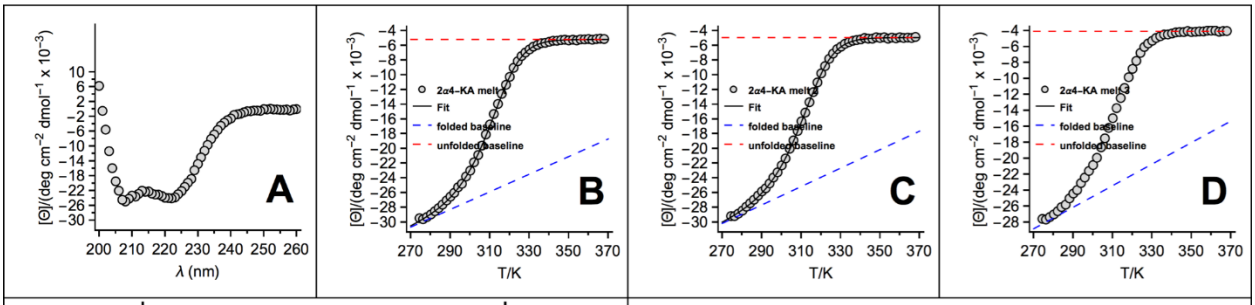


Parameters	Values	Units	P–Values
ΔG_0	−6.85 ± 0.03	kcal/mol	<0.001
ΔG_1	0.103 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−66.2 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.141 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.6 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−69.3 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.150 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.9 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−70.0 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.148 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.8 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99994
sum residuals^2 = 2.20431

For **p2α4–AE**, at 314.7 K,
ΔG_f = −6.85 ± 0.03 kcal/mol

Figure S160. CD data for **p2α4-AE** (QX11196).

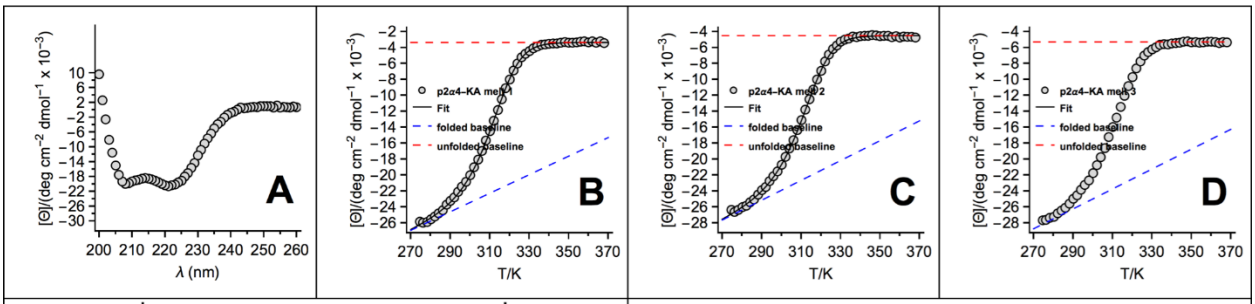


Parameters	Values	Units	P–Values
ΔG_0	−6.23 ± 0.02	kcal/mol	<0.001
ΔG_1	0.097 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−63.0 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.120 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−5.2 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−64.0 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.125 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.9 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−65.3 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.135 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.1 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 1.28625

For **2α4–KA**, at 314.7 K,
ΔG_f = −6.23 ± 0.02 kcal/mol

Figure S161. CD data for **2α4-KA** (QX11192).

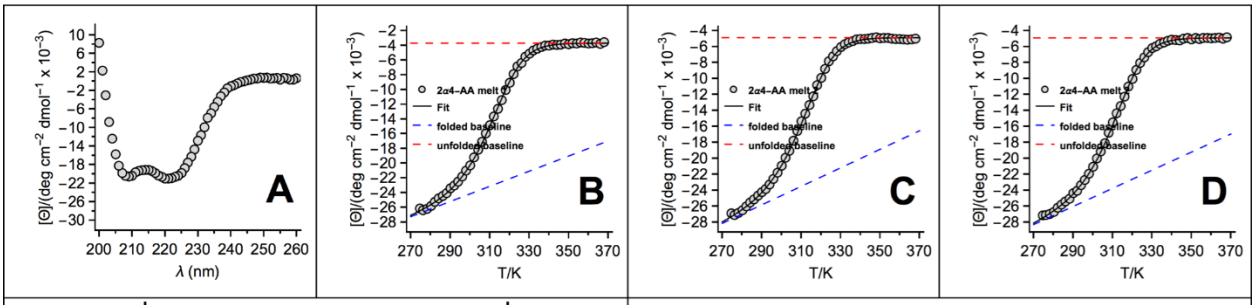


Parameters	Values	Units	P–Values
ΔG_0	−6.27 ± 0.02	kcal/mol	<0.001
ΔG_1	0.106 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−58.4 ± 1.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.116 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.4 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−61.3 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.125 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.5 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−62.5 ± 1.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.125 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.3 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99994
sum residuals^2 = 1.87605

For **p2α4–KA**, at 314.7 K,
ΔG_f = −6.27 ± 0.02 kcal/mol

Figure S162. CD data for **p2α4-KA** (QX11195).

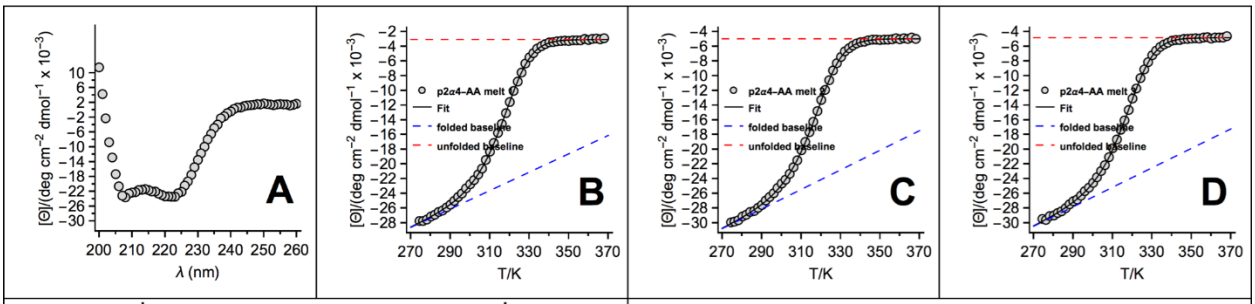


Parameters	Values	Units	P–Values
ΔG_0	−6.29 ± 0.03	kcal/mol	<0.001
ΔG_1	0.092 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−55.1 ± 2.1	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.103 ± 0.008	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.70 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−59.5 ± 2.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.116 ± 0.007	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.88 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−59.0 ± 2.1	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.114 ± 0.007	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.91 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 2.35891

For **2α4–AA**, at 314.7 K,
ΔG_f = −6.29 ± 0.03 kcal/mol

Figure S163. CD data for **2α4-AA** (QX11191).

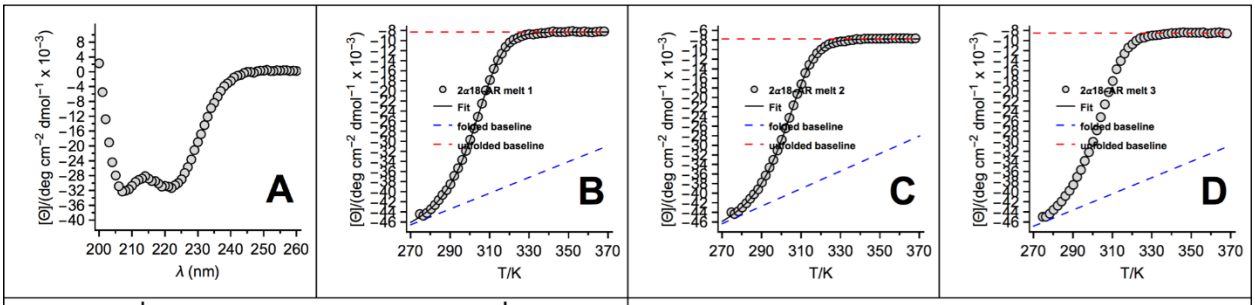


Parameters	Values	Units	P–Values
ΔG_0	−7.00 ± 0.02	kcal/mol	<0.001
ΔG_1	0.111 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−62.4 ± 0.9	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.125 ± 0.003	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.1 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−66.7 ± 0.9	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.133 ± 0.003	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−5.0 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−66.2 ± 0.9	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.132 ± 0.003	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.8 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99998
sum residuals^2 = 1.05503

For **p2α4–AA**, at 314.7 K,
ΔG_f = −7.00 ± 0.02 kcal/mol

Figure S164. CD data **p2α4-AA** (QX11194).

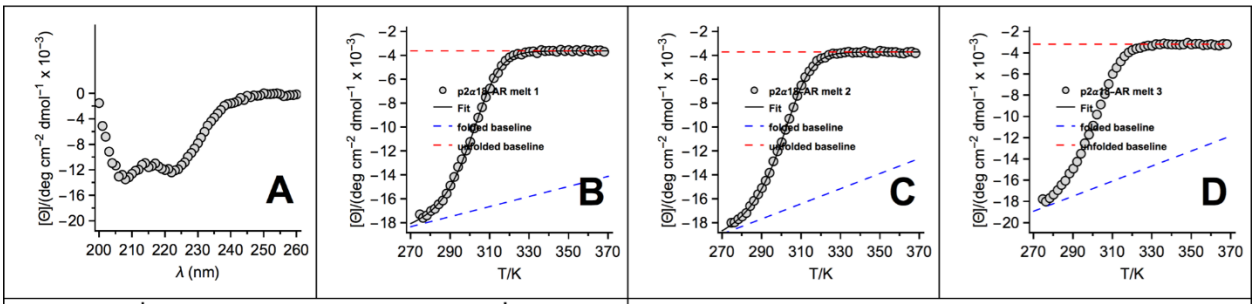


Parameters	Values	Units	P–Values
ΔG_0	−5.59 ± 0.02	kcal/mol	<0.001
ΔG_1	0.105 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−88.9 ± 3.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.157 ± 0.013	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−8.3 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−95.8 ± 3.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.183 ± 0.012	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−7.7 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−90.2 ± 3.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.161 ± 0.012	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−8.5 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.86407

For **2α18–AR**, at 311.0 K,
ΔG_f = −5.59 ± 0.02 kcal/mol

Figure S165. CD data for **2α18-AR** (NAB10211).

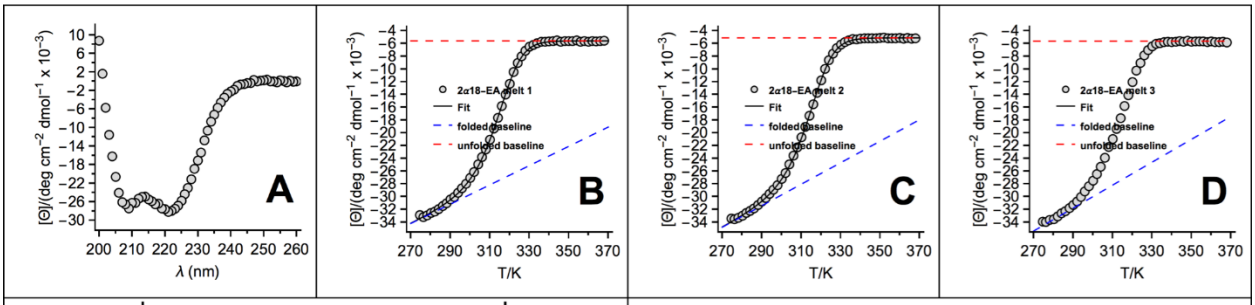


Parameters	Values	Units	P–Values
ΔG_0	−5.30 ± 0.02	kcal/mol	<0.001
ΔG_1	0.103 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−29.7 ± 2.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.042 ± 0.010	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.6 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−36.0 ± 2.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.063 ± 0.010	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.7 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−38.0 ± 2.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.071 ± 0.010	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.2 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99990
sum residuals^2 = 1.23606

For **p2α18–AR**, at 311.0 K,
ΔG_f = −5.30 ± 0.02 kcal/mol

Figure S166. CD data for **p2α18-AR** (NAB10214).

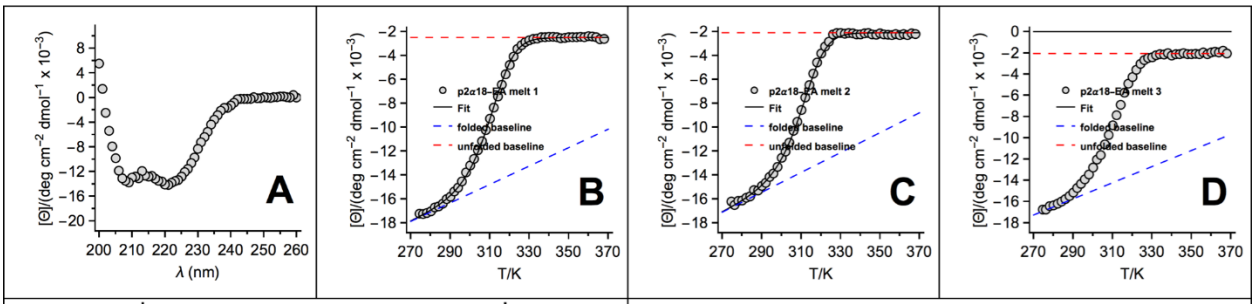


Parameters	Values	Units	P–Values
ΔG_0	−7.07 ± 0.03	kcal/mol	<0.001
ΔG_1	0.128 ± 0.002	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−75.0 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.151 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−5.6 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−80.3 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.169 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−5.1 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−83.9 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.180 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.6 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 3.77412

For **2α18–EA**, at 311.0 K,
ΔG_f = −7.07 ± 0.03 kcal/mol

Figure S167. CD data **2α18-EA** (NAB10212).

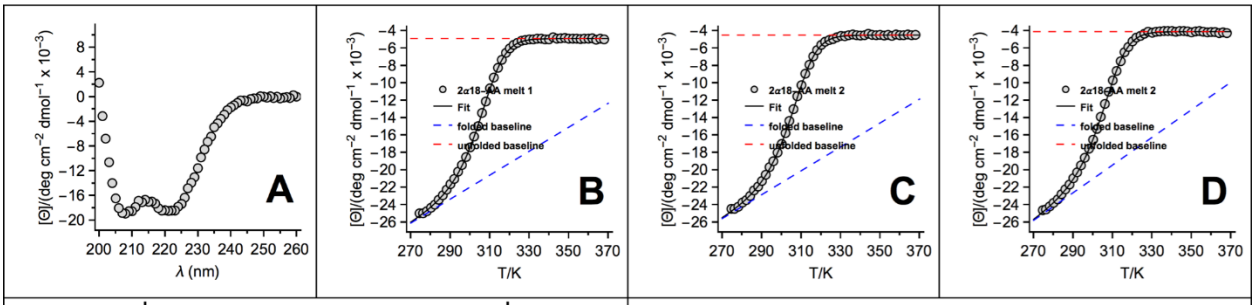


Parameters	Values	Units	P–Values
ΔG_0	−6.51 ± 0.04	kcal/mol	<0.001
ΔG_1	0.127 ± 0.003	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−38.7 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.077 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.5 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−39.6 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.083 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.1 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−37.8 ± 1.8	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.076 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.1 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99981
sum residuals^2 = 2.47370

For **p2α18–EA**, at 311.0 K,
ΔG_f = −6.51 ± 0.04 kcal/mol

Figure S168. CD data for **p2α18-EA** (NAB10215).

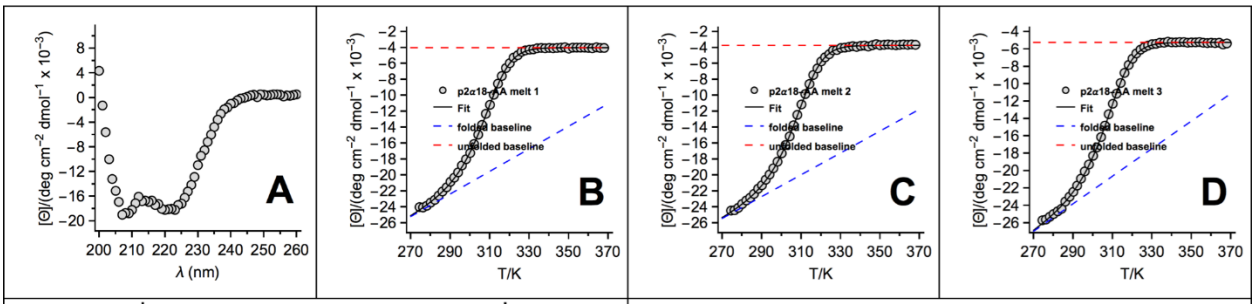


Parameters	Values	Units	P–Values
ΔG_0	−5.84 ± 0.02	kcal/mol	<0.001
ΔG_1	0.123 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−63.3 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.138 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.90 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−62.7 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.137 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.51 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−68.7 ± 1.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.159 ± 0.005	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.11 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 0.92348

For **2α18–AA**, at 311.0 K,
ΔG_f = −5.84 ± 0.02 kcal/mol

Figure S169. CD data for **2α18-AA** (NAB10213).

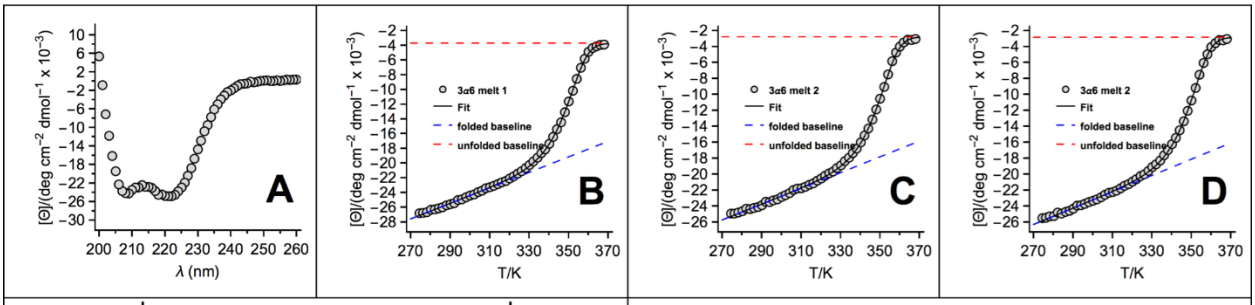


Parameters	Values	Units	P–Values
ΔG_0	−6.17 ± 0.02	kcal/mol	<0.001
ΔG_1	0.115 ± 0.001	kcal/mol/K	<0.001
ΔG_2	---	---	---
a1	−63.5 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.142 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.0 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−62.5 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.137 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.7 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−69.8 ± 1.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.159 ± 0.006	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.2 ± 0.0	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 1.18404

For **p2α18–AA**, at 311.0 K,
ΔG_f = −6.17 ± 0.02 kcal/mol

Figure S170. CD data for **p2α18-AA** (NAB10216).

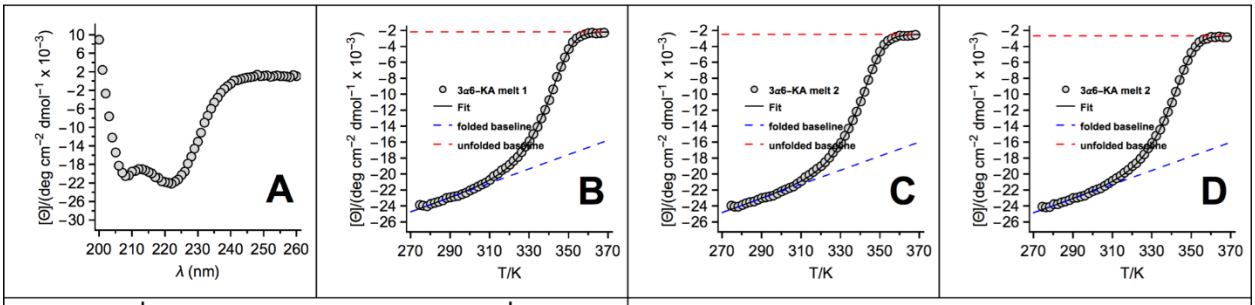


Parameters	Values	Units	P–Values
ΔG_0	−15.71 ± 0.02	kcal/mol	<0.001
ΔG_1	0.209 ± 0.003	kcal/mol/K	<0.001
a1	−56.0 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.105 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.69 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−52.5 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.099 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.76 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−53.9 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.102 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.82 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.02707

For **3α6**, at 345.5 K,
ΔG_f = −15.71 ± 0.02 kcal/mol

Figure S171. CD data for **3α6** (QX10511).

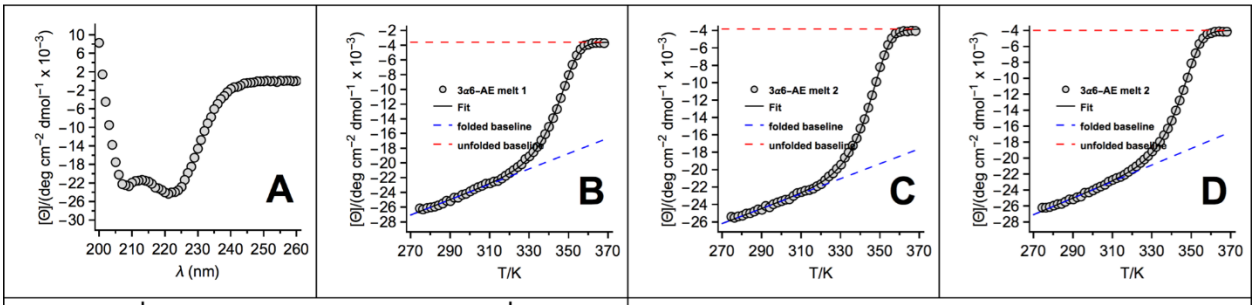


Parameters	Values	Units	P–Values
ΔG_0	−13.48 ± 0.02	kcal/mol	<0.001
ΔG_1	0.162 ± 0.002	kcal/mol/K	<0.001
a1	−49.0 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.090 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.15 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−48.7 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.088 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.47 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−48.7 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.088 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.65 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99994
sum residuals^2 = 2.51684

For **3α6–KA**, at 345.5 K,
ΔG_f = −13.48 ± 0.02 kcal/mol

Figure S172. CD data for **3α6-KA** (QX10512).

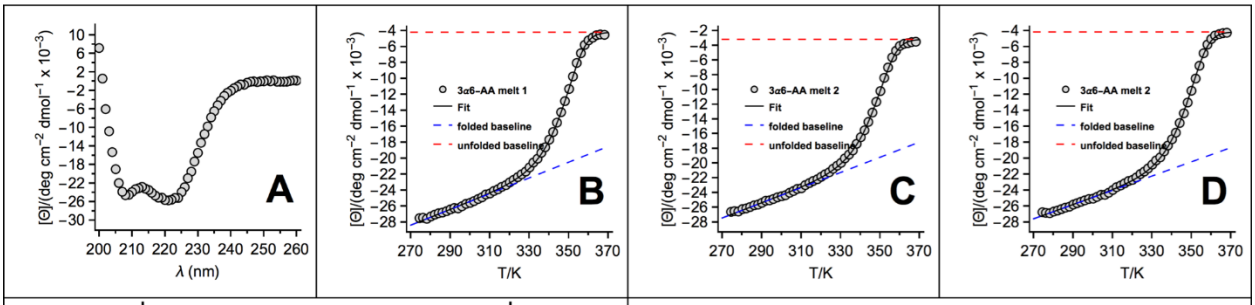


Parameters	Values	Units	P–Values
ΔG_0	−14.51 ± 0.02	kcal/mol	<0.001
ΔG_1	0.203 ± 0.003	kcal/mol/K	<0.001
a1	−55.2 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.104 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.57 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−49.4 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.086 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.81 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−55.1 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.104 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.97 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 2.56195

For **3α6–AE**, at 345.5 K,
ΔG_f = −14.51 ± 0.02 kcal/mol

Figure S173. CD data for **3α6-AE** (QX10513).

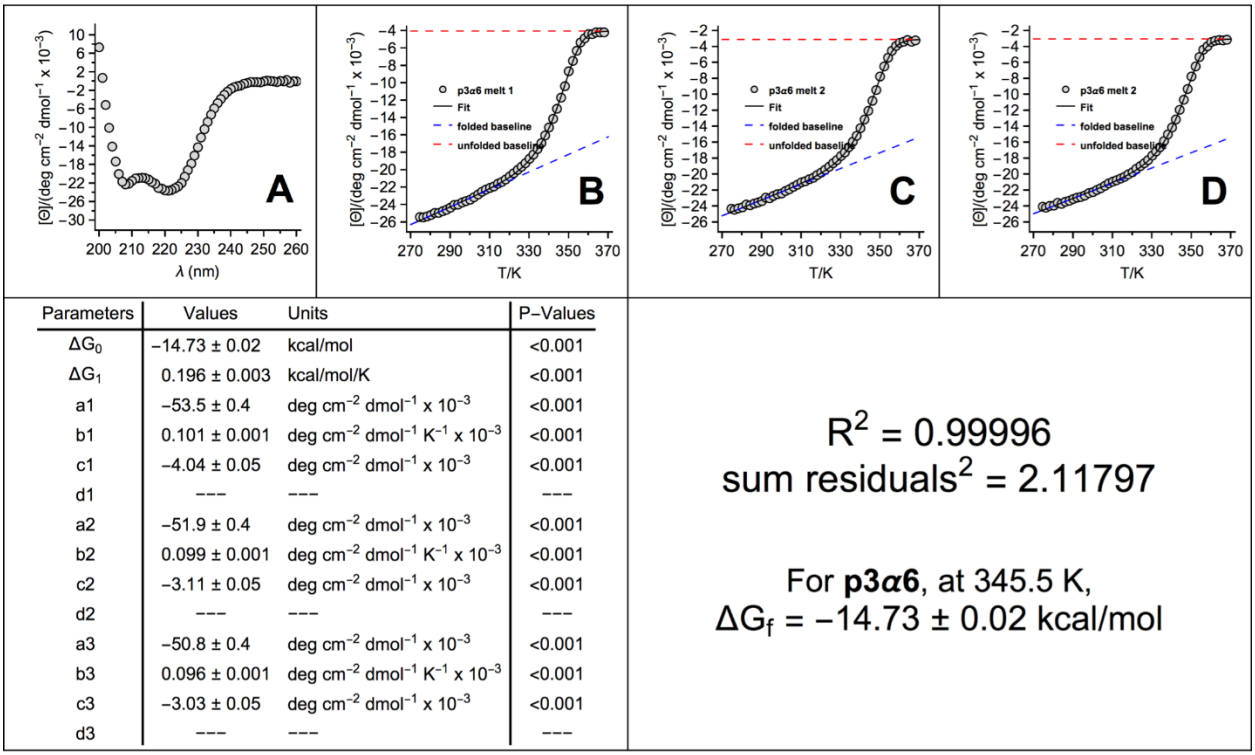


Parameters	Values	Units	P–Values
ΔG_0	−15.25 ± 0.02	kcal/mol	<0.001
ΔG_1	0.196 ± 0.003	kcal/mol/K	<0.001
a1	−55.1 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.099 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.20 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−55.3 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.103 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.18 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−51.7 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.089 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.16 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 2.98222

For **3α6–AA**, at 345.5 K,
ΔG_f = −15.25 ± 0.02 kcal/mol

Figure S174. CD data for **3α6-AA** (QX10514).

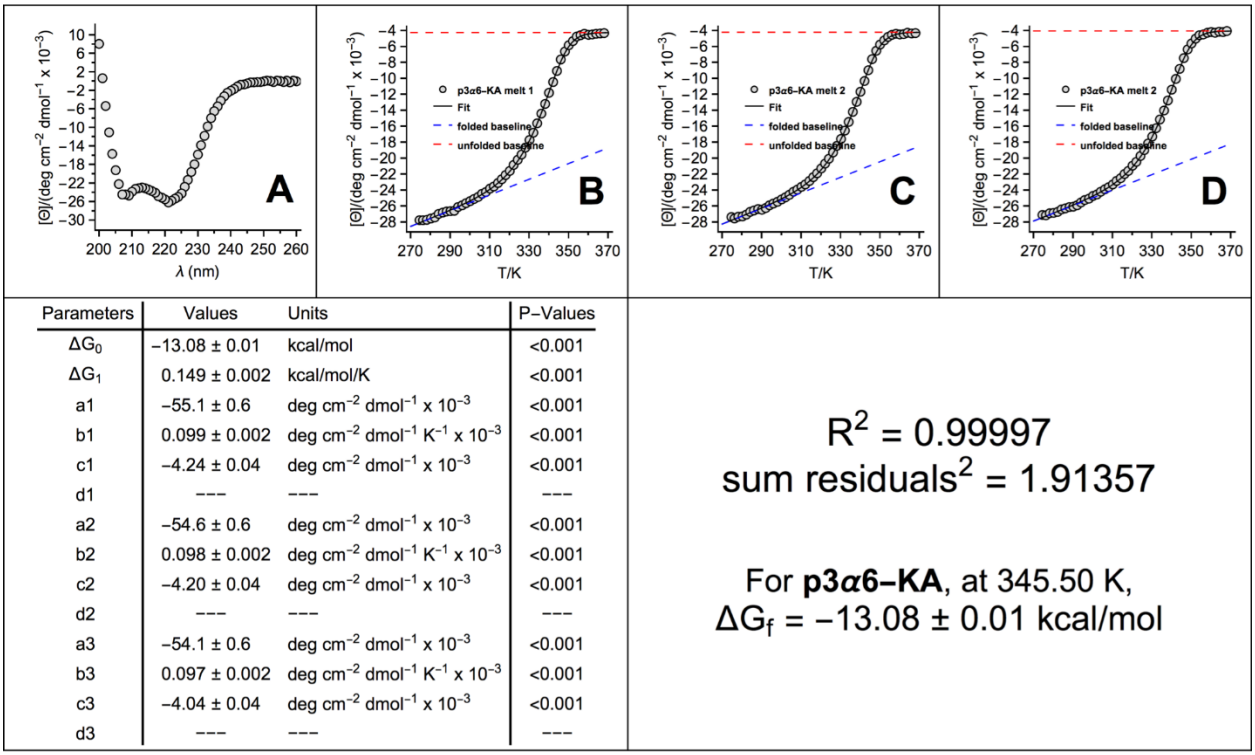


Parameters	Values	Units	P–Values
ΔG_0	−14.73 ± 0.02	kcal/mol	<0.001
ΔG_1	0.196 ± 0.003	kcal/mol/K	<0.001
a1	−53.5 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.101 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.04 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−51.9 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.099 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.11 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−50.8 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.096 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.03 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.11797

For **p3α6**, at 345.5 K,
ΔG_f = −14.73 ± 0.02 kcal/mol

Figure S175. CD data for **p3α6** (QX10515).

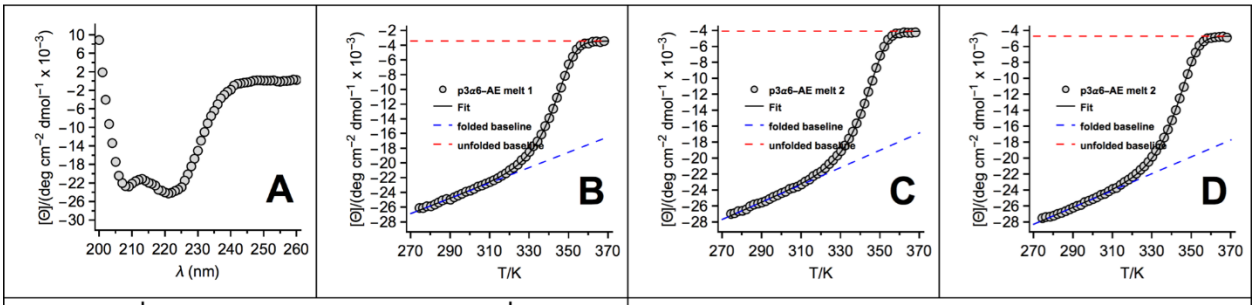


Parameters	Values	Units	P–Values
ΔG_0	−13.08 ± 0.01	kcal/mol	<0.001
ΔG_1	0.149 ± 0.002	kcal/mol/K	<0.001
a1	−55.1 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.099 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.24 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−54.6 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.098 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.20 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−54.1 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.097 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.04 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 1.91357

For **p3α6–KA**, at 345.50 K,
ΔG_f = −13.08 ± 0.01 kcal/mol

Figure S176. CD data for **p3α6-KA** (QX10516).

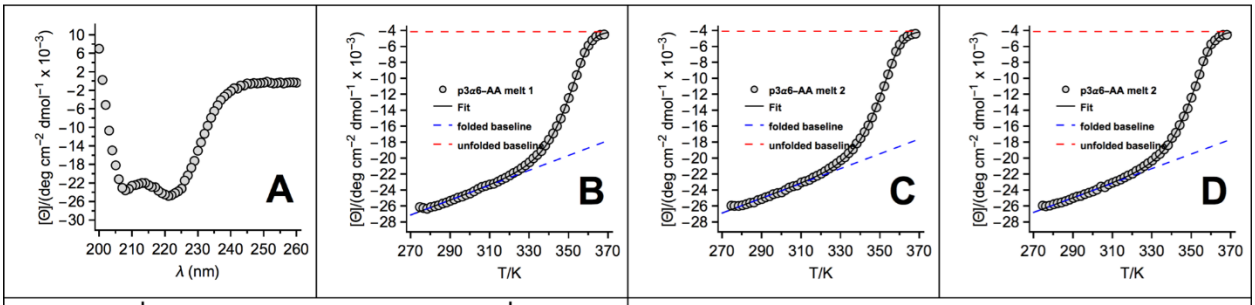


Parameters	Values	Units	P–Values
ΔG_0	−14.10 ± 0.01	kcal/mol	<0.001
ΔG_1	0.198 ± 0.002	kcal/mol/K	<0.001
a1	−55.0 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.104 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.40 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−57.0 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.108 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.06 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−56.8 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.106 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.70 ± 0.04	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 1.56742

For **p3α6–AE**, at 345.5 K,
ΔG_f = −14.10 ± 0.01 kcal/mol

Figure S177. CD data for **p3α6-AE** (QX10517).

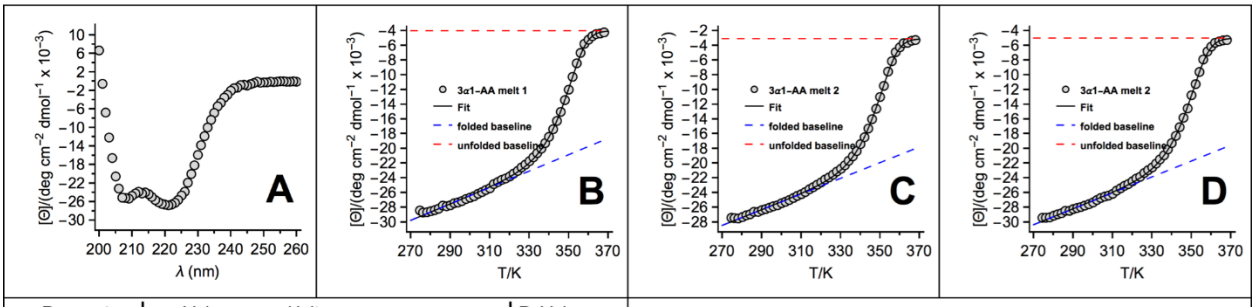


Parameters	Values	Units	P–Values
ΔG_0	−15.76 ± 0.03	kcal/mol	<0.001
ΔG_1	0.195 ± 0.003	kcal/mol/K	<0.001
a1	−52.3 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.093 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.13 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−52.0 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.093 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.07 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−51.5 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.092 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.11 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.40870

For **p3α6–AA**, at 345.5 K,
ΔG_f = −15.76 ± 0.03 kcal/mol

Figure S178. CD data for **p3α6-AA** (QX10518).

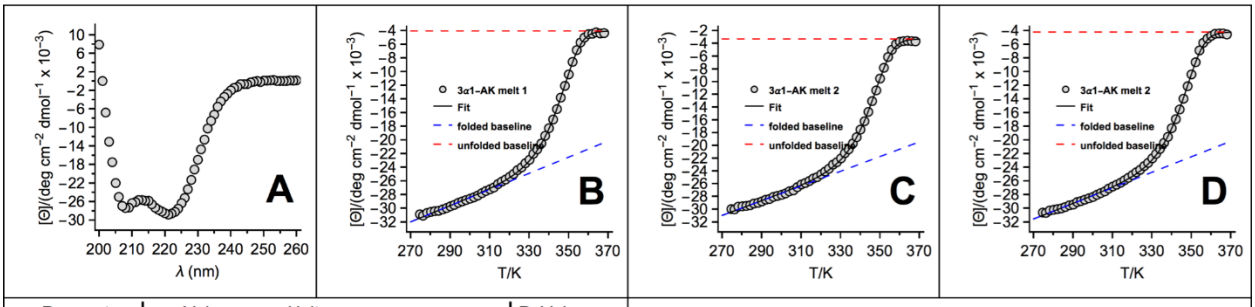


Parameters	Values	Units	P–Values
ΔG_0	−14.92 ± 0.03	kcal/mol	<0.001
ΔG_1	0.199 ± 0.004	kcal/mol/K	<0.001
a1	−59.9 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.111 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.01 ± 0.09	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−57.2 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.107 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.09 ± 0.09	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−59.6 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.108 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−5.01 ± 0.09	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 4.92008

For **3α1–AA**, at 347.9 K,
ΔG_f = −14.92 ± 0.03 kcal/mol

Figure S179. CD spectra **3α1-AA** (QX10711).

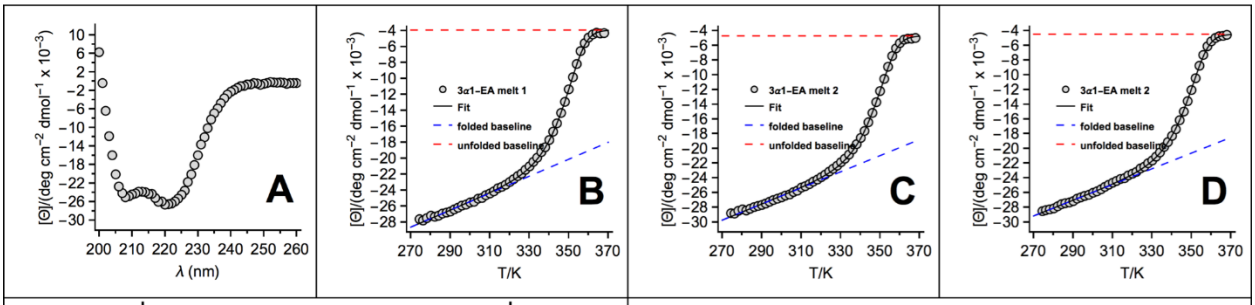


Parameters	Values	Units	P–Values
ΔG_0	−14.23 ± 0.02	kcal/mol	<0.001
ΔG_1	0.193 ± 0.003	kcal/mol/K	<0.001
a1	−63.9 ± 0.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.118 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.04 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−62.1 ± 0.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.115 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.29 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−62.3 ± 0.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.114 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.20 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99994
sum residuals^2 = 4.85482

For **3α1–AK**, at 347.9 K,
ΔG_f = −14.23 ± 0.02 kcal/mol

Figure S180. CD spectra for **3α1-AK** (QX10712).

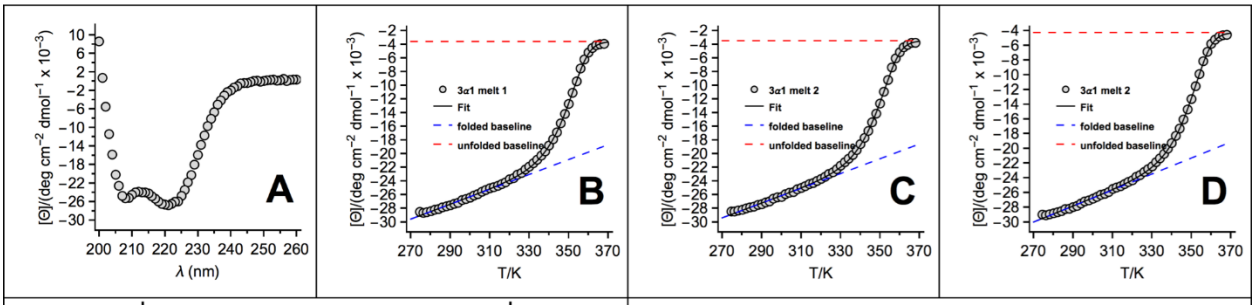


Parameters	Values	Units	P–Values
ΔG_0	−14.90 ± 0.02	kcal/mol	<0.001
ΔG_1	0.203 ± 0.003	kcal/mol/K	<0.001
a1	−57.4 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.106 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.92 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−59.3 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.110 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−4.71 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−58.0 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.107 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.48 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 3.13842

For **3α1–EA**, at 347.9 K,
ΔG_f = −14.90 ± 0.02 kcal/mol

Figure S181. CD data for **3α1-EA** (QX10713).

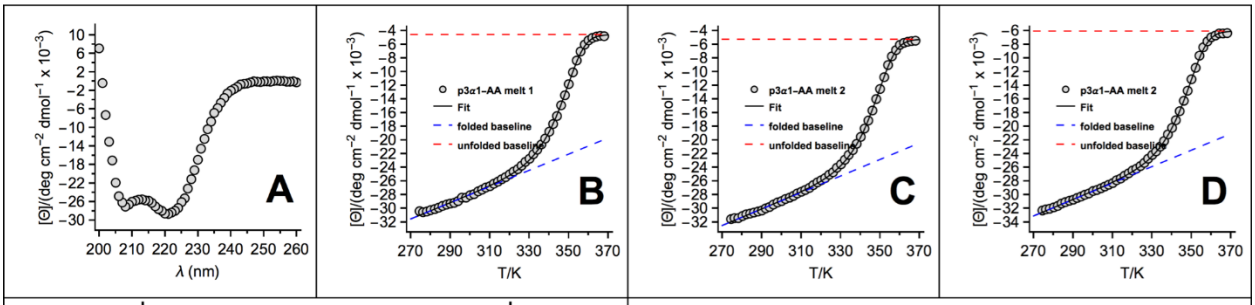


Parameters	Values	Units	P–Values
ΔG_0	−15.24 ± 0.02	kcal/mol	<0.001
ΔG_1	0.202 ± 0.003	kcal/mol/K	<0.001
a1	−59.0 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.109 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.58 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−58.6 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.108 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.47 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−59.3 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.109 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.25 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.62268

For **3α1**, at 347.9 K,
ΔG_f = −15.24 ± 0.02 kcal/mol

Figure S182. CD data for **3α1** (QX10714).

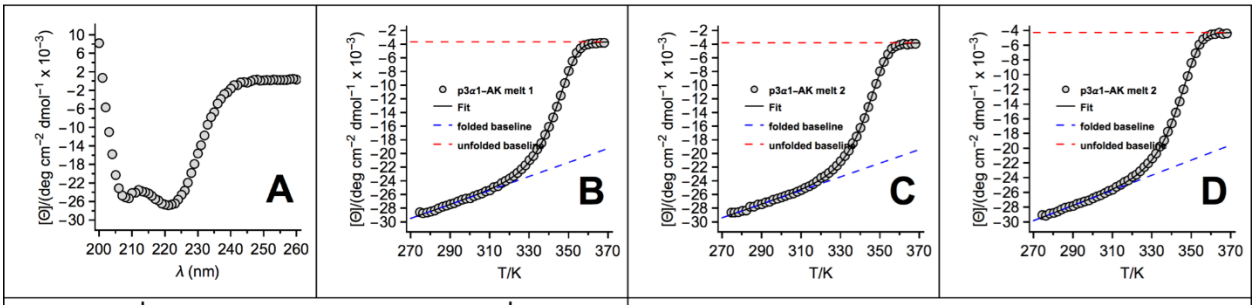


Parameters	Values	Units	P–Values
ΔG_0	−14.59 ± 0.02	kcal/mol	<0.001
ΔG_1	0.190 ± 0.003	kcal/mol/K	<0.001
a1	−63.6 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.119 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.56 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−65.1 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.121 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−5.25 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−65.6 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.120 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−6.06 ± 0.07	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.89625

For **p3α1–AA**, at 347.9 K,
ΔG_f = −14.59 ± 0.02 kcal/mol

Figure S183. CD data for **p3α1-AA** (QX10715).

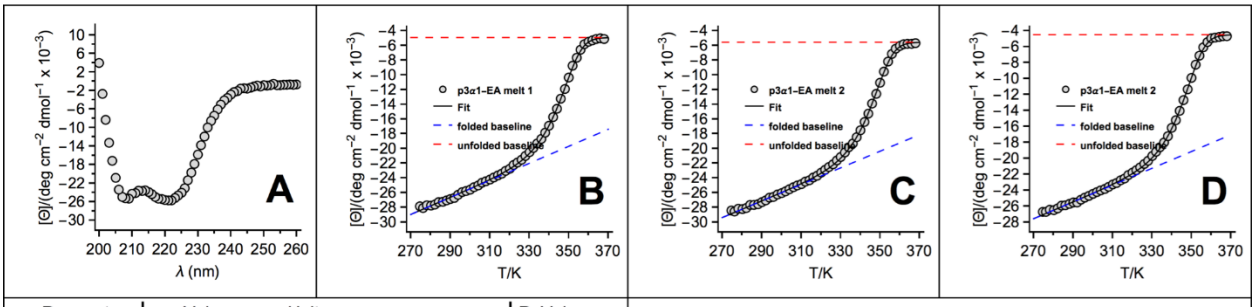


Parameters	Values	Units	P–Values
ΔG_0	−13.76 ± 0.01	kcal/mol	<0.001
ΔG_1	0.195 ± 0.002	kcal/mol/K	<0.001
a1	−57.1 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.102 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.64 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−56.3 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.100 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.77 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−57.6 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.103 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.26 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99997
sum residuals^2 = 1.99570

For **p3α1–AK**, at 347.9 K,
ΔG_f = −13.76 ± 0.01 kcal/mol

Figure S184. CD data for **p3α1-AK** (QX10716).

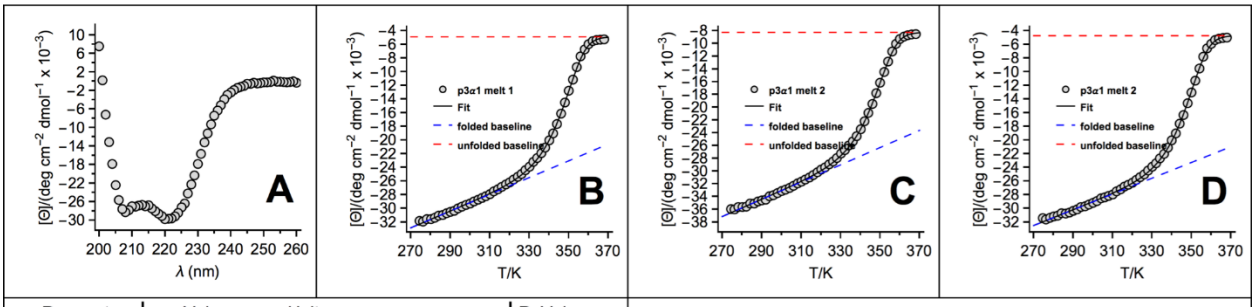


Parameters	Values	Units	P–Values
ΔG_0	−14.40 ± 0.02	kcal/mol	<0.001
ΔG_1	0.197 ± 0.003	kcal/mol/K	<0.001
a1	−60.2 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.116 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.94 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−59.8 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.113 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−5.56 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−56.0 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.105 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.51 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.63899

For **p3α1–EA**, at 347.9 K,
ΔG_f = −14.40 ± 0.02 kcal/mol

Figure S185. CD data for **p3α1-EA** (QX10717).

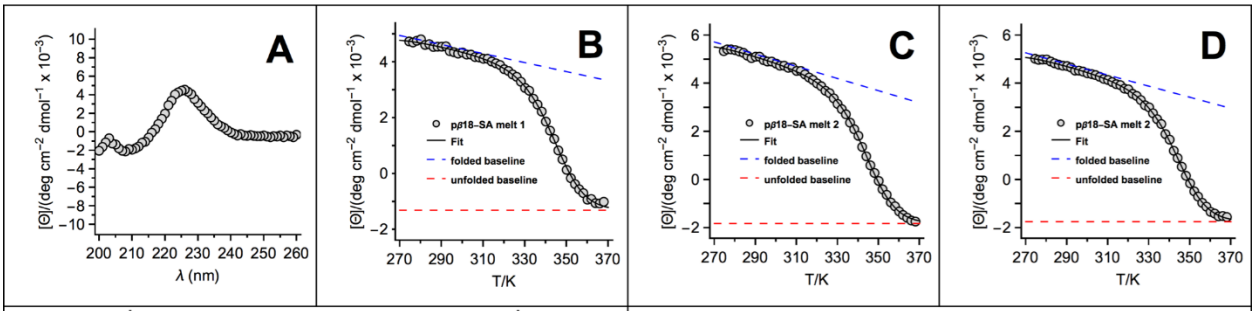


Parameters	Values	Units	P–Values
ΔG_0	−14.76 ± 0.02	kcal/mol	<0.001
ΔG_1	0.192 ± 0.003	kcal/mol/K	<0.001
a1	−65.9 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.123 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−4.90 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−73.6 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.135 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−8.27 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−63.6 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.115 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.74 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 3.75790

For **p3α1**, at 347.9 K,
ΔG_f = −14.76 ± 0.02 kcal/mol

Figure S186. CD data for **p3α1** (QX10718).

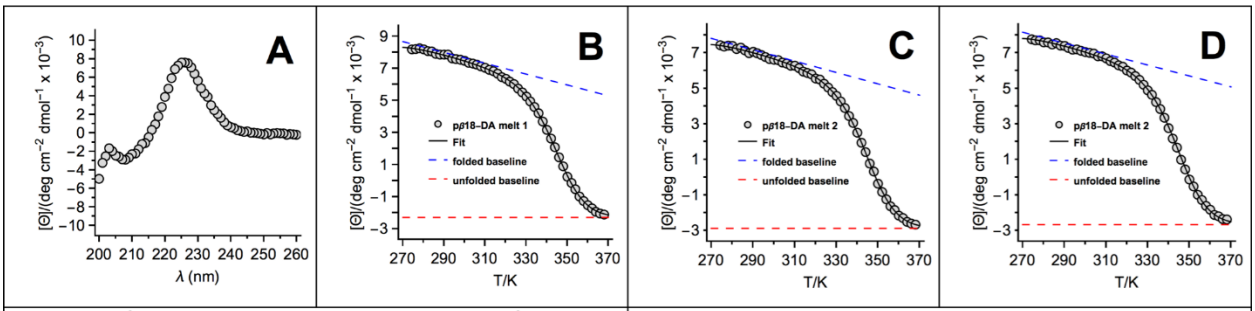


Parameters	Values	Units	P–Values
ΔH_0	−30.4 ± 0.5	kcal/mol	<0.001
T_m	70.8 ± 0.1	°C	<0.001
ΔC_p	−0.54 ± 0.03	kcal/mol/K	<0.001
a1	9.3 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0162 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−1.31 ± 0.03	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	12.5 ± 0.3	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0253 ± 0.0011	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−1.82 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	11.5 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0231 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−1.74 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99983
sum residuals^2 = 0.30571

For **pβ18–SA**, at 345.4 K,
ΔG_f = 0.13 ± 0.01 kcal/mol
ΔH_f = −31.1 ± 0.5 kcal/mol
$-T\Delta S_f$ = 31.3 ± 0.5 kcal/mol

Figure S187. CD data for **pβ18-SA** (QX10491).

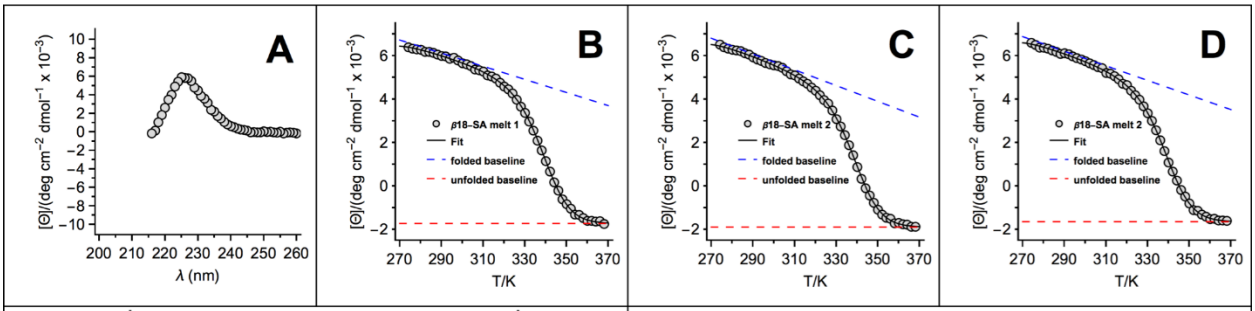


Parameters	Values	Units	P–Values
ΔH_0	−31.1 ± 0.3	kcal/mol	<0.001
T_m	71.3 ± 0.1	°C	<0.001
ΔC_p	−0.56 ± 0.02	kcal/mol/K	<0.001
a1	17.8 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0338 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.29 ± 0.03	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	16.4 ± 0.3	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0320 ± 0.0010	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.88 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	16.5 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0307 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.67 ± 0.03	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99993
sum residuals^2 = 0.30538

For **pβ18–DA**, at 345.4 K,
ΔG_f = 0.09 ± 0.01 kcal/mol
ΔH_f = −31.7 ± 0.3 kcal/mol
$-T\Delta S_f$ = 31.8 ± 0.3 kcal/mol

Figure S188. CD data for **pβ18-DA** (QX10492).

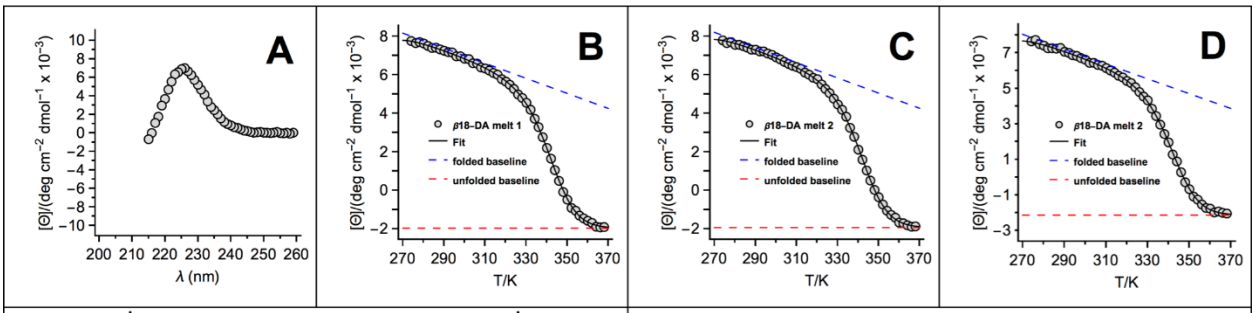


Parameters	Values	Units	P–Values
ΔH_0	−33.6 ± 0.3	kcal/mol	<0.001
T_m	65.7 ± 0.1	°C	<0.001
ΔC_p	−0.67 ± 0.02	kcal/mol/K	<0.001
a1	14.9 ± 0.2	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0302 ± 0.0008	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−1.72 ± 0.01	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	16.6 ± 0.2	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0363 ± 0.0008	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−1.89 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	15.9 ± 0.2	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0336 ± 0.0008	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−1.64 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

$R^2 = 0.99993$
sum residuals^2 = 0.17580

For **β18–SA**, at 345.4 K,
ΔG_f = 0.70 ± 0.01 kcal/mol
ΔH_f = −38.0 ± 0.3 kcal/mol
$-T\Delta S_f$ = 38.7 ± 0.3 kcal/mol

Figure S189. CD data for **β18-SA** (QX10493).

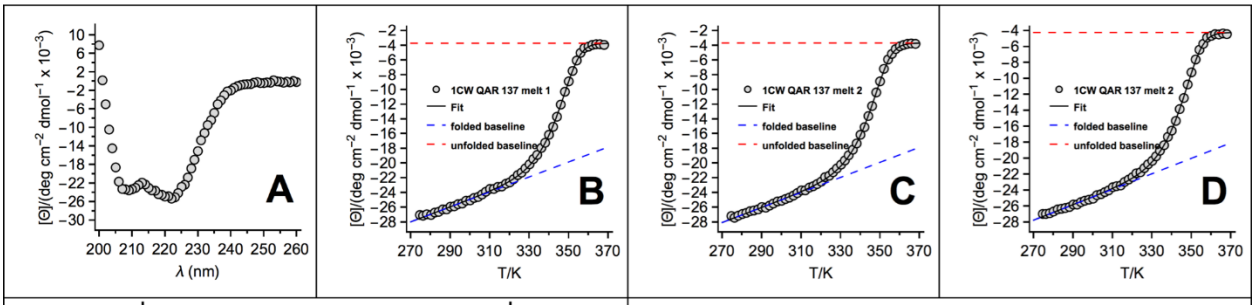


Parameters	Values	Units	P–Values
ΔH_0	−34.2 ± 0.4	kcal/mol	<0.001
T_m	68.7 ± 0.1	°C	<0.001
ΔC_p	−0.67 ± 0.02	kcal/mol/K	<0.001
a1	18.7 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0391 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−1.97 ± 0.02	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	18.8 ± 0.3	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0394 ± 0.0010	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−1.94 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	19.3 ± 0.3	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0417 ± 0.0010	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.14 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

$R^2 = 0.99992$
sum residuals^2 = 0.33626

For **β18–DA**, at 345.4 K,
ΔG_f = 0.37 ± 0.01 kcal/mol
ΔH_f = −36.6 ± 0.4 kcal/mol
$-T\Delta S_f$ = 37.0 ± 0.4 kcal/mol

Figure S190. CD data for **β18-DA** (QX10494).

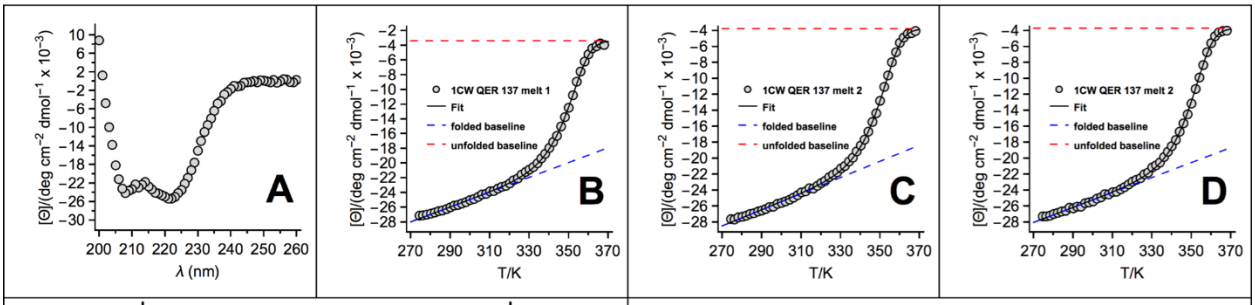


Parameters	Values	Units	P–Values
ΔG_0	−14.18 ± 0.02	kcal/mol	<0.001
ΔG_1	0.202 ± 0.003	kcal/mol/K	<0.001
a1	−55.4 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.102 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.71 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−55.7 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.102 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.67 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−53.9 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.097 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−4.23 ± 0.06	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 2.54893

For **1CW QAR 137**, at 347.80 K,
ΔG_f = −14.18 ± 0.02 kcal/mol

Figure S191. CD data for **3α1-AR** (QX21531).

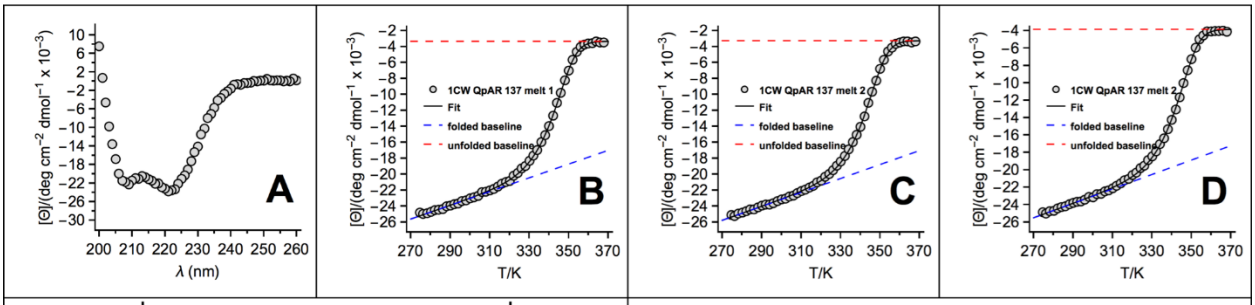


Parameters	Values	Units	P–Values
ΔG_0	−15.38 ± 0.02	kcal/mol	<0.001
ΔG_1	0.200 ± 0.003	kcal/mol/K	<0.001
a1	−55.2 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.101 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.37 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−55.8 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.101 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.75 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−53.4 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.094 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.69 ± 0.08	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99995
sum residuals^2 = 2.98957

For **1CW QER 137**, at 347.80 K,
ΔG_f = −15.38 ± 0.02 kcal/mol

Figure S192. CD data for **3α1-ER** (QX21532).

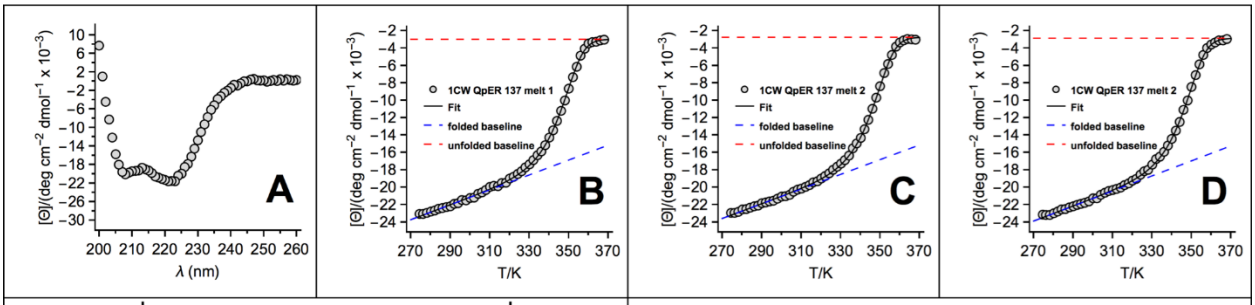


Parameters	Values	Units	P–Values
ΔG_0	−13.68 ± 0.01	kcal/mol	<0.001
ΔG_1	0.192 ± 0.002	kcal/mol/K	<0.001
a1	−48.9 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.086 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−3.33 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−49.4 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.087 ± 0.002	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−3.25 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−47.9 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.083 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.84 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 1.93856

For **1CW QpAR 137**, at 347.80 K,
ΔG_f = −13.68 ± 0.01 kcal/mol

Figure S193. CD data for **p3α1-AR** (QX21533).

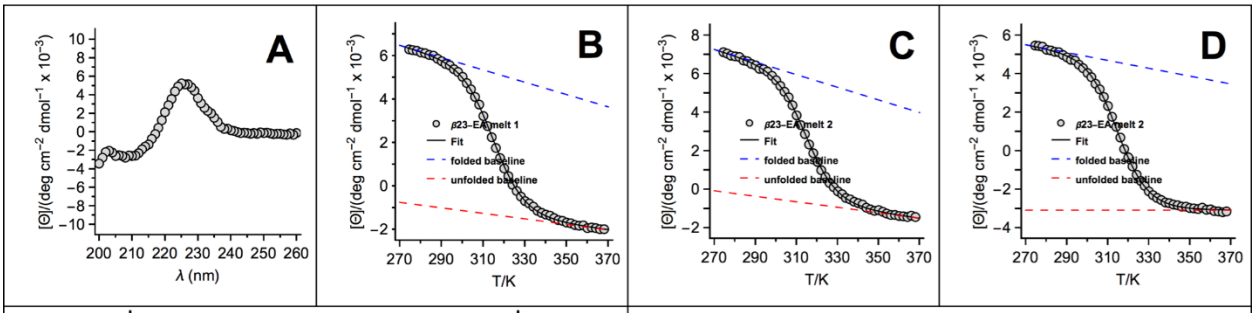


Parameters	Values	Units	P–Values
ΔG_0	−14.61 ± 0.02	kcal/mol	<0.001
ΔG_1	0.199 ± 0.003	kcal/mol/K	<0.001
a1	−46.9 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b1	0.086 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.99 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	−46.4 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	0.084 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.76 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	−47.2 ± 0.4	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b3	0.086 ± 0.001	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−2.87 ± 0.05	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99996
sum residuals^2 = 1.90592

For **1CW QpER 137**, at 347.80 K,
ΔG_f = −14.61 ± 0.02 kcal/mol

Figure S194. CD data for **p3α1-ER** (QX21534).

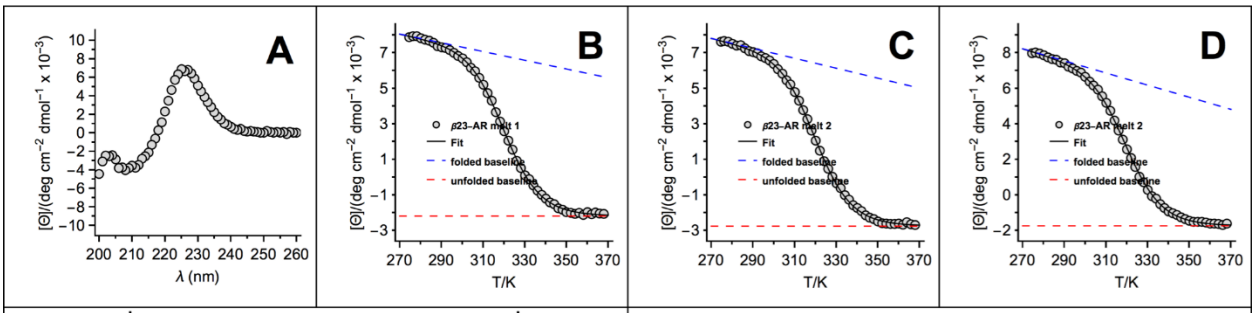


Parameters	Values	Units	P–Values
ΔH_0	−27.0 ± 0.3	kcal/mol	<0.001
T_m	42.5 ± 0.1	°C	<0.001
ΔC_p	---	---	---
a1	14.1 ± 0.6	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0283 ± 0.0020	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	2.67 ± 0.39	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	−0.0127 ± 0.0011	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a2	16.1 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0328 ± 0.0020	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	3.79 ± 0.39	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	−0.0143 ± 0.0011	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a3	11.0 ± 0.6	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0204 ± 0.0020	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−3.08 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

$R^2 = 0.99982$
sum residuals^2 = 0.34809

For ***β*23–EA**, at 320.6 K,
ΔG_f = 0.42 ± 0.01 kcal/mol
ΔH_f = −27.0 ± 0.3 kcal/mol
$-T\Delta S_f$ = 27.4 ± 0.3 kcal/mol

Figure S195. CD data for **β23-EA** (SD2006#2).

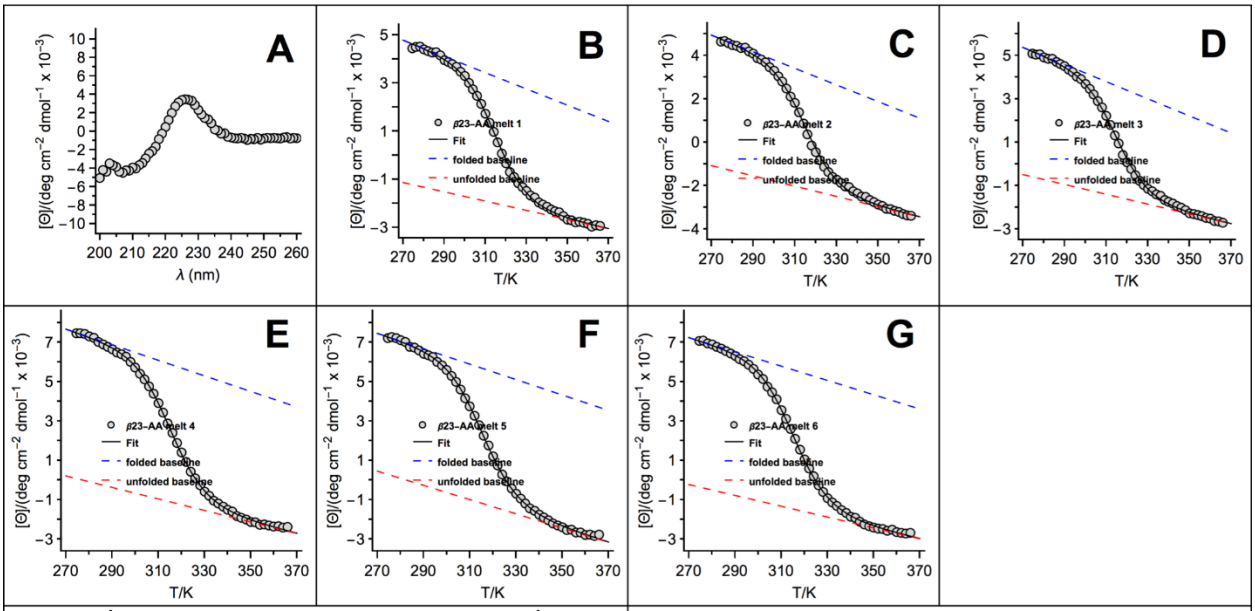


Parameters	Values	Units	P–Values
ΔH_0	−24.2 ± 0.2	kcal/mol	<0.001
T_m	48.0 ± 0.1	°C	<0.001
ΔC_p	---	---	---
a1	14.7 ± 0.6	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0246 ± 0.0020	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.19 ± 0.02	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	15.4 ± 0.6	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0280 ± 0.0020	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.76 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	17.4 ± 0.5	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0341 ± 0.0019	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−1.74 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

$R^2 = 0.99984$
sum residuals^2 = 0.52203

For ***β*23–AR**, at 320.6 K,
ΔG_f = −0.04 ± 0.01 kcal/mol
ΔH_f = −24.2 ± 0.2 kcal/mol
$-T\Delta S_f$ = 24.1 ± 0.2 kcal/mol

Figure S196. CD data for **β23-AR** (SD2018).

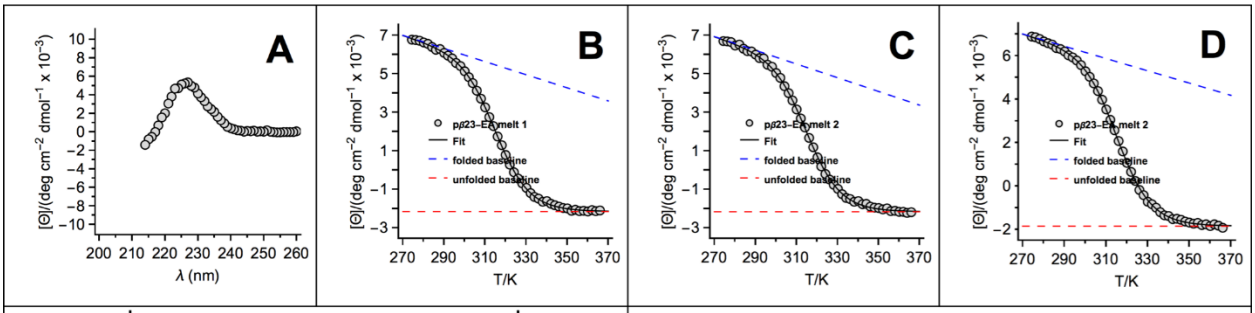


Parameters	Values	Units	P–Values
ΔH_0	−26.1 ± 0.5	kcal/mol	<0.001
T_m	42.8 ± 0.2	°C	<0.001
ΔC_p	---	---	---
a1	13.9 ± 0.7	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0338 ± 0.0024	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	4.05 ± 0.63	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	−0.0192 ± 0.0018	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a2	15.3 ± 0.7	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0383 ± 0.0024	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	5.31 ± 0.63	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	−0.0237 ± 0.0018	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a3	16.0 ± 0.7	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0395 ± 0.0024	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	5.63 ± 0.62	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	−0.0227 ± 0.0018	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a4	18.3 ± 0.8	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b4	−0.0396 ± 0.0027	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c4	8.11 ± 0.71	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d4	−0.0293 ± 0.0020	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a5	18.0 ± 0.8	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b5	−0.03915 ± 0.00270	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c5	10.21 ± 0.71	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d5	−0.03615 ± 0.00199	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a6	17.0 ± 0.8	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b6	−0.036275 ± 0.002743	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c6	7.20 ± 0.71	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d6	−0.0275 ± 0.0020	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001

$R^2 = 0.99964$
sum residuals^2 = 1.34249

For ***β*23–AA**, at 320.6 K,
$\Delta G_f = 0.38 \pm 0.02$ kcal/mol
$\Delta H_f = -26.1 \pm 0.5$ kcal/mol
$-T\Delta S_f = 26.5 \pm 0.5$ kcal/mol

Figure S197. CD data for **β23-AA** (SD2006#1).

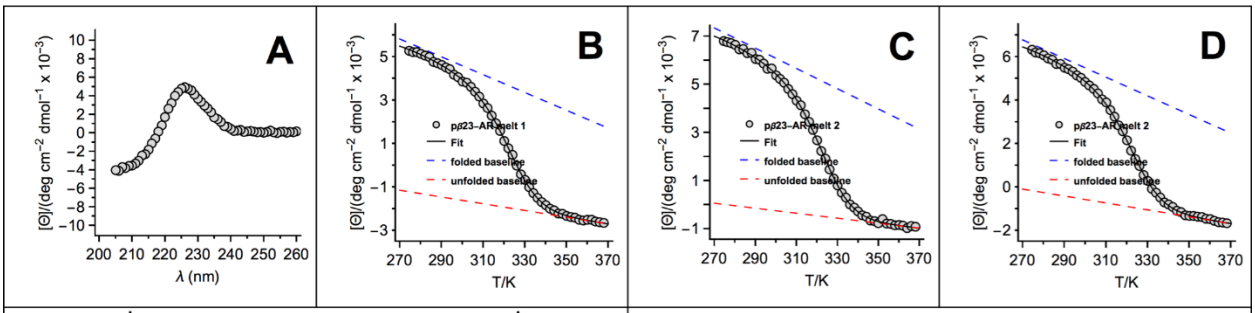


Parameters	Values	Units	P–Values
ΔH_0	−24.7 ± 0.2	kcal/mol	<0.001
T_m	43.4 ± 0.1	°C	<0.001
ΔC_p	---	---	---
a1	16.2 ± 0.5	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0340 ± 0.0018	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−2.16 ± 0.01	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	16.5 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0356 ± 0.0018	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−2.17 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	14.6 ± 0.5	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0282 ± 0.0018	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−1.85 ± 0.01	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

R^2 = 0.99986
sum residuals^2 = 0.28687

For **pβ23–EA**, at 320.6 K,
ΔG_f = 0.31 ± 0.01 kcal/mol
ΔH_f = −24.7 ± 0.2 kcal/mol
$-T\Delta S_f$ = 25.0 ± 0.2 kcal/mol

Figure S198. CD data for p**β23-EA** (SD2006#2C).

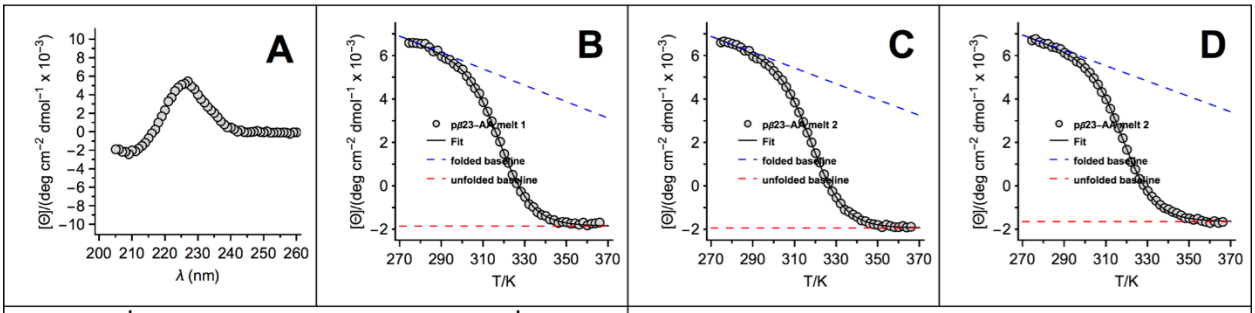


Parameters	Values	Units	P–Values
ΔH_0	−25.2 ± 0.5	kcal/mol	<0.001
T_m	48.6 ± 0.2	°C	<0.001
ΔC_p	−0.56 ± 0.06	kcal/mol/K	<0.001
a1	16.9 ± 0.9	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0410 ± 0.0029	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	3.04 ± 0.60	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	−0.0155 ± 0.0017	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a2	18.7 ± 0.9	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0421 ± 0.0030	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	2.87 ± 0.61	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	−0.0104 ± 0.0017	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
a3	18.4 ± 0.9	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0430 ± 0.0029	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	4.20 ± 0.59	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	−0.0159 ± 0.0016	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001

R^2 = 0.99987
sum residuals^2 = 0.23939

For **pβ23–AR**, at 320.6 K,
ΔG_f = −0.09 ± 0.02 kcal/mol
ΔH_f = −24.6 ± 0.5 kcal/mol
$-T\Delta S_f$ = 24.5 ± 0.5 kcal/mol

Figure S199. CD data for **pβ23-AR** (SD2018C).



Parameters	Values	Units	P–Values
ΔH_0	−26.6 ± 0.3	kcal/mol	<0.001
T_m	46.5 ± 0.1	°C	<0.001
ΔC_p	---	---	---
a1	17.1 ± 0.5	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b1	−0.0378 ± 0.0016	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c1	−1.85 ± 0.02	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
d1	---	---	---
a2	16.7 ± 0.5	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
b2	−0.0364 ± 0.0017	deg cm^{-2} dmol^{-1} K^{-1} x 10^{-3}	<0.001
c2	−1.94 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d2	---	---	---
a3	16.5 ± 0.5	deg cm^2 dmol^{-1} x 10^{-3}	<0.001
b3	−0.0354 ± 0.0016	deg cm^2 dmol^{-1} K^{-1} x 10^{-3}	<0.001
c3	−1.64 ± 0.02	deg cm^{-2} dmol^{-1} x 10^{-3}	<0.001
d3	---	---	---

$R^2 = 0.99983$
sum residuals^2 = 0.37473

For **pβ23–AA**, at 320.6 K,
$\Delta G_f = 0.08 \pm 0.01$ kcal/mol
$\Delta H_f = -26.6 \pm 0.3$ kcal/mol
$-T\Delta S_f = 26.7 \pm 0.3$ kcal/mol

Figure S200. CD spectra for **pβ23-AA** (SD2006#1C).

Table S5. Triple mutant box analysis of the impact of PEGylation on salt-bridge strength within peptide **p3α1-ER**.[a]

Peptide	Sequence	T_m (°C)	ΔG_f (kcal/mol)	$\Delta\Delta G_f$ [b] (kcal/mol)	$\Delta\Delta\Delta G_f$ [c] (kcal/mol)	$\Delta\Delta\Delta\Delta G_f$ [d] (kcal/mol)
3α1-ER	QVEALERKVEALESKVQKLEKKVEALEHGWDGR	77.9	-15.38 ± 0.02		-0.60 ± 0.02	
3α1-EA	QVEALEA••••••••••••••••••••••••••••	76.0	-14.90 ± 0.02			
3α1-AR	QVAALER••••••••••••••••••••••••••••	73.0	-14.18 ± 0.02			
3α1-AA	QVAALEA••••••••••••••••••••••••••••	76.1	-14.92 ± 0.03			
p3α1-ER	**Q**VEALER••••••••••••••••••••••••••••	74.7	-14.61 ± 0.02	0.38 ± 0.01	-0.56 ± 0.02	0.05 ± 0.03
p3α1-EA	**Q**VEALEA••••••••••••••••••••••••••••	73.9	-14.40 ± 0.02	0.17 ± 0.01		
p3α1-AR	**Q**VAALER••••••••••••••••••••••••••••	70.7	-13.68 ± 0.01	0.25 ± 0.01		
p3α1-AA	**Q**VAALEA••••••••••••••••••••••••••••	74.7	-14.59 ± 0.02	0.11 ± 0.01		

[a]**Q** = GlnPEG. Variable temperature CD experiments were performed in 20 mM phosphate buffer (pH 7) at 30 μM protein concentration. ΔG_f values are given ± standard error at the average melting temperature for these variants (347.8 K). [b]Impact of PEGylation on peptide/protein conformational stability. [c]Strength of salt-bridge interaction. [d]Impact of PEGylation on salt-bridge strength.

3. Crystallographic characterization of 2α18 and p2α18

2α18: 2α18 was crystalized by vapor diffusion in sitting drops where the well solution contained 0.1 M PCTP (sodium propionate, sodium cacodylate trihydrate, and bis-Tris Propane) and 25% w/v PEG 1500 at pH 4. Each drop contained 0.3 µL well solution and 0.3 µL peptide (10 mg/ml in water). Crystals were looped and cryocooled by plunging them into liquid nitrogen prior to data collection. Data were collected at 100 K with a copper rotating anode X-ray source (Bruker FR-591 Dual Source Low Temperature X-ray Diffractometer with CCD Detector).

p2α18: 2α18 was crystalized by vapor diffusion in sitting drops where the well solution contained 0.1 M sodium malonate dibasic monohydrate and 25% w/v PEG 1500 at pH 4. Each drop contained 0.3 µL well solution and 0.3 µL peptide (10 mg/ml in water). Crystals were looped and cryocooled by plunging them into liquid nitrogen prior to data collection. Data were collected at 100 K with a copper rotating anode X-ray source (Bruker FR-591 Dual Source Low Temperature X-ray Diffractometer with CCD Detector).

The data were integrated and scaled using Protium. The molecular replacement and refinement were done in Phenix. Model building was carried out in winCOOT.

Table S6. Crystallographic statistics

Data collection 2α18 unPEGylated	**PDB ID: 6O2E**	**Data collection p2α18 PEGylated**	**PDB ID: 6O2F**
Space Group	I 21 21 21	Space Group	I 21 21 21
Unit cell dimensions (Å)	19.3, 30.0, 107.1; 90, 90, 90	Unit cell dimensions (Å)	19.2, 30.0, 106.8; 90, 90, 90
Resolution (Å)	28.9-1.90	Resolution (Å)	28.9-1.80
Total Observations	15,787	Total Observations	33,482
Unique observations	2,679	Unique observations	3,133
Redundancy	5.9 (1.9)	Redundancy	9.8 (1.75)
Completeness (%)	99.04 (93.02)	Completeness (%)	99.74 (99.66)
I/σ	9.5 (0.76)	<I/σI>	11.9 (0.76)
Rpim	0.067	Rpim	0.047
Refinement		**Refinement**	
Resolution (Å)	28.9-1.90	Resolution (Å)	28.9-1.80
Rcryst[b]	0.214 (0.298)	Rcryst[b]	0.180 (0.248)
Rfree[c]	0.248 (0.311)	Rfree[c]	0.235 (0.310)
Average B-factor	26.21	Average B-factor	22.48
RMSD: bonds (Å) / angles (°)	0.008 / 1.04	RMSD: bonds (Å) / angles (°)	0.012 / 1.26

4. References:

1. Lawrence, P. B., Billings, W. M., Miller, M. B., Pandey, B. K., Stephens, A. R., Langlois, M. I., and Price, J. L. (2016) Conjugation Strategy Strongly Impacts the Conformational Stability of a PEG-Protein Conjugate, *ACS Chem. Biol. 11*, 1805–1809.
2. Smith, M. S., Lawrence, E. E. K., Billings, W. M., Larsen, K. S., Bécar, N. A., and Price, J. L. (2017) An Anion−π Interaction Strongly Stabilizes the β-Sheet Protein WW, *ACS Chemical Biology*.
3. Deiters, A., Cropp, T. A., Mukherji, M., Chin, J. W., Anderson, J. C., and Schultz, P. G. (2003) Adding Amino Acids with Novel Reactivity to the Genetic Code of Saccharomyces Cerevisiae, *J. Am. Chem. Soc. 125*, 11782-11783.
4. Lawrence, P. B., Gavrilov, Y., Matthews, S. S., Langlois, M. I., Shental-Bechor, D., Greenblatt, H. M., Pandey, B. K., Smith, M. S., Paxman, R., Torgerson, C. D., Merrell, J. P., Ritz, C. C., Prigozhin, M. B., Levy, Y., and Price, J. L. (2014) Criteria for Selecting PEGylation Sites on Proteins for Higher Thermodynamic and Proteolytic Stability, *J. Am. Chem. Soc. 136*, 17547-17560.
5. Pandey, B. K., Smith, M. S., Torgerson, C., Lawrence, P. B., Matthews, S. S., Watkins, E., Groves, M. L., Prigozhin, M. B., and Price, J. L. (2013) Impact of Site-Specific PEGylation on the Conformational Stability and Folding Rate of the Pin WW Domain Depends Strongly on PEG Oligomer Length, *Bioconjugate Chem. 24*, 796-802.
6. Ciani, B., Bjelić, S., Honnappa, S., Jawhari, H., Jaussi, R., Payapilly, A., Jowitt, T., Steinmetz, M. O., and Kammerer, R. A. J. P. o. t. N. A. o. S. (2010) Molecular basis of coiled-coil oligomerization-state specificity, *107*, 19850-19855.
7. Spector, S., Young, P., and Raleigh, D. P. J. B. (1999) Nativelike structure and stability in a truncation mutant of a protein minidomain: the peripheral subunit-binding domain, *38*, 4128-4136.
8. Edelhoch, H. (1967) Spectroscopic Determination of Tryptophan and Tyrosine in Proteins, *Biochemistry 6*, 1948–1954.