Piperazine and DBU: A safer alternative for rapid and efficient Fmoc deprotection in Solid Phase Peptide Synthesis

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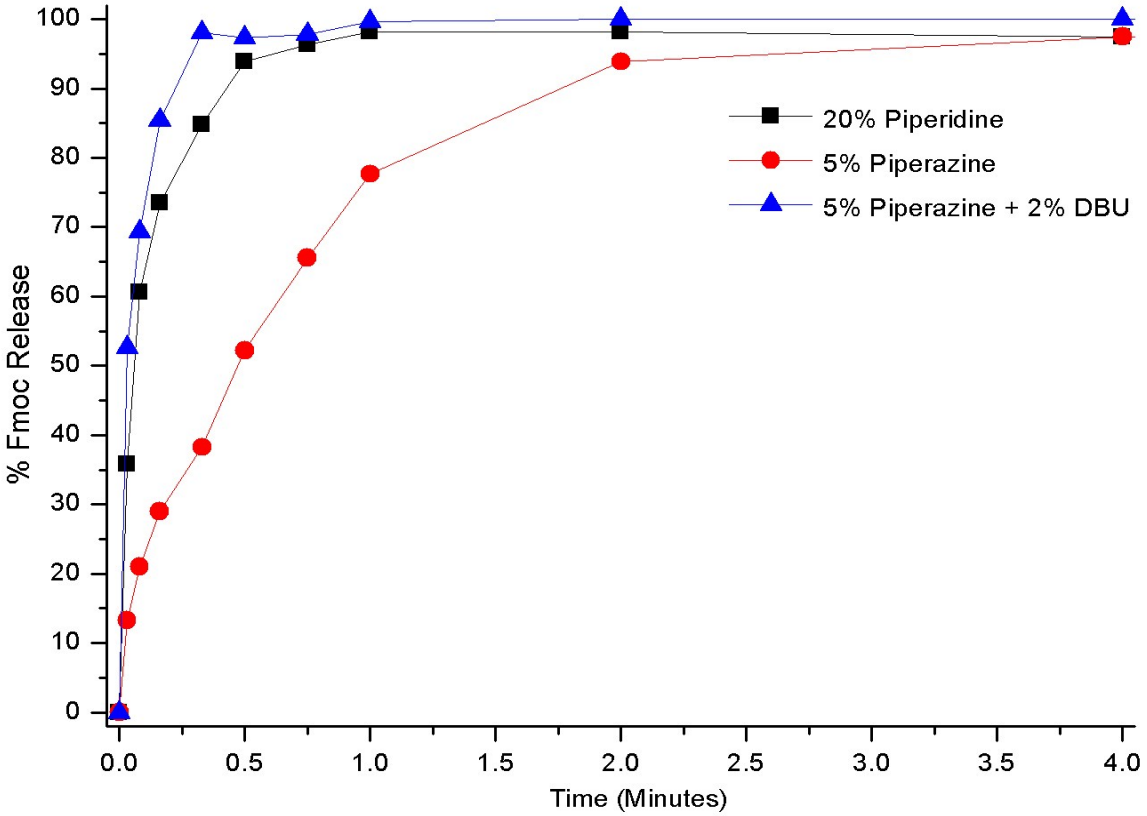
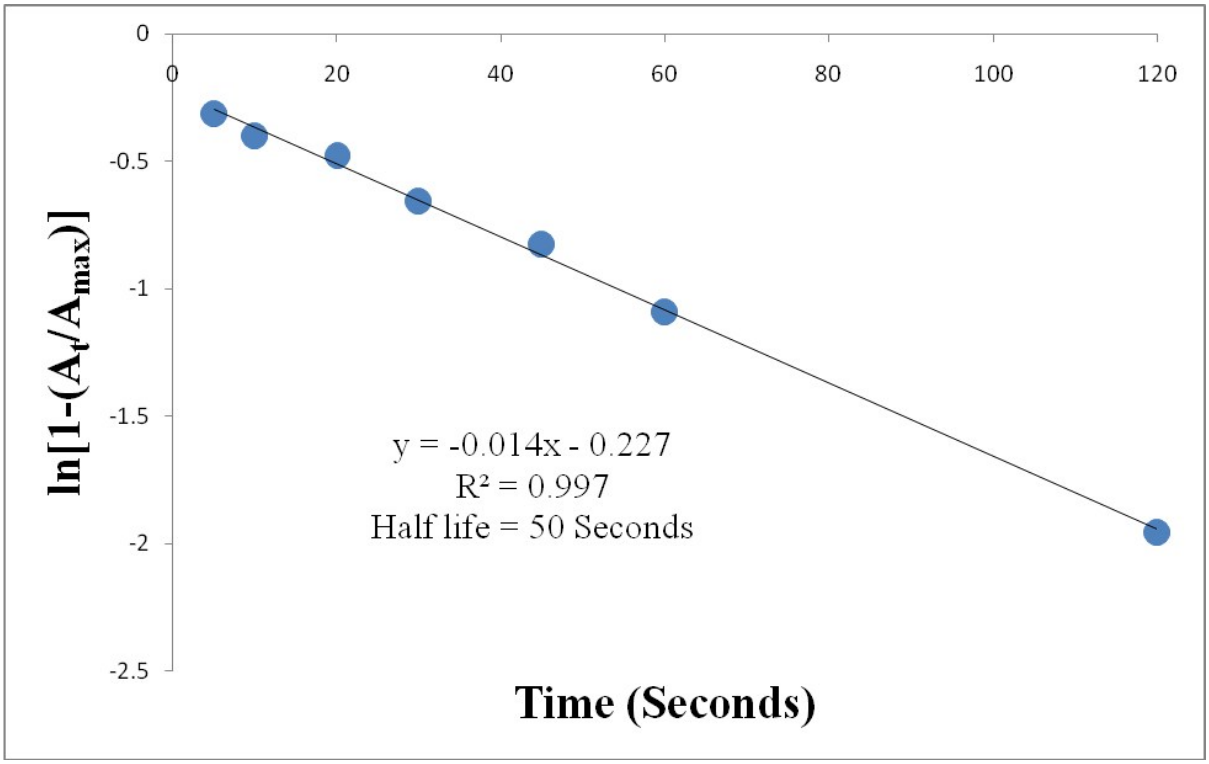
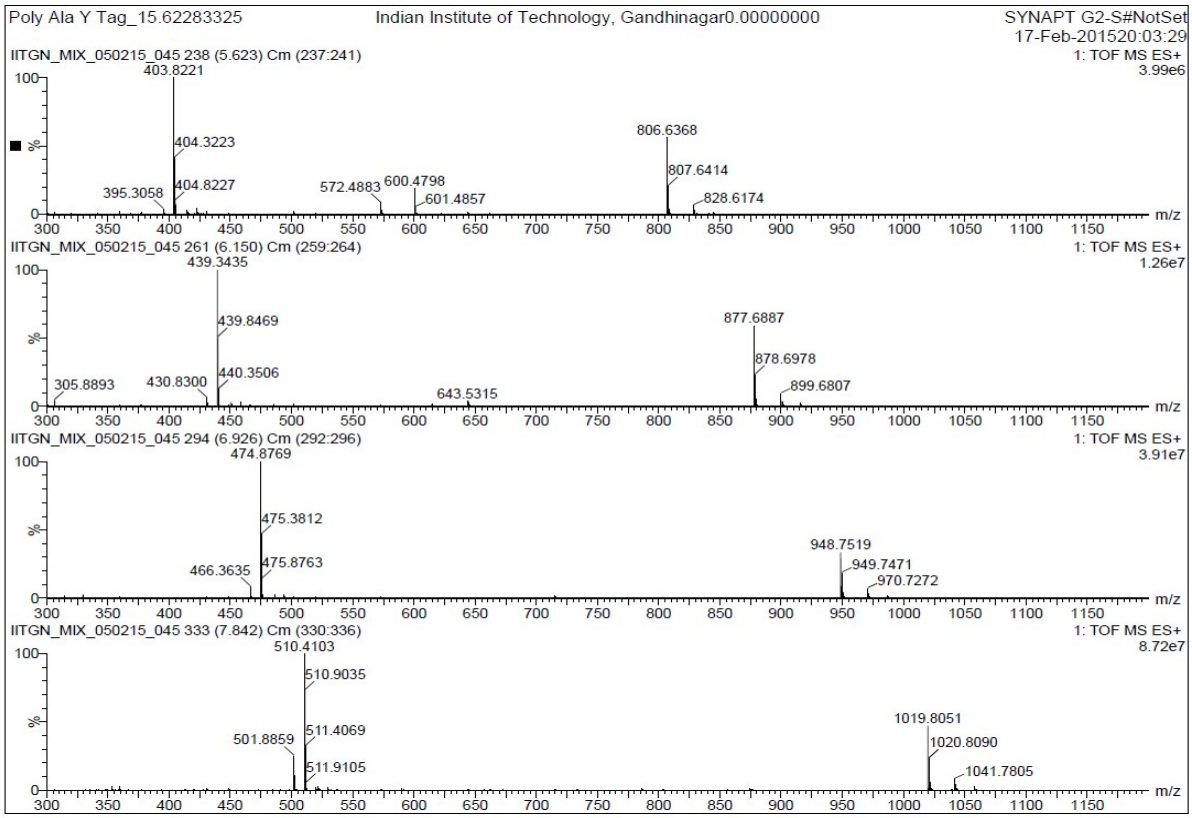


Supplementary Figure 1. Comparative plot showing % Fmoc release by various deprotection solutions for resin bound Fmoc-Valine.



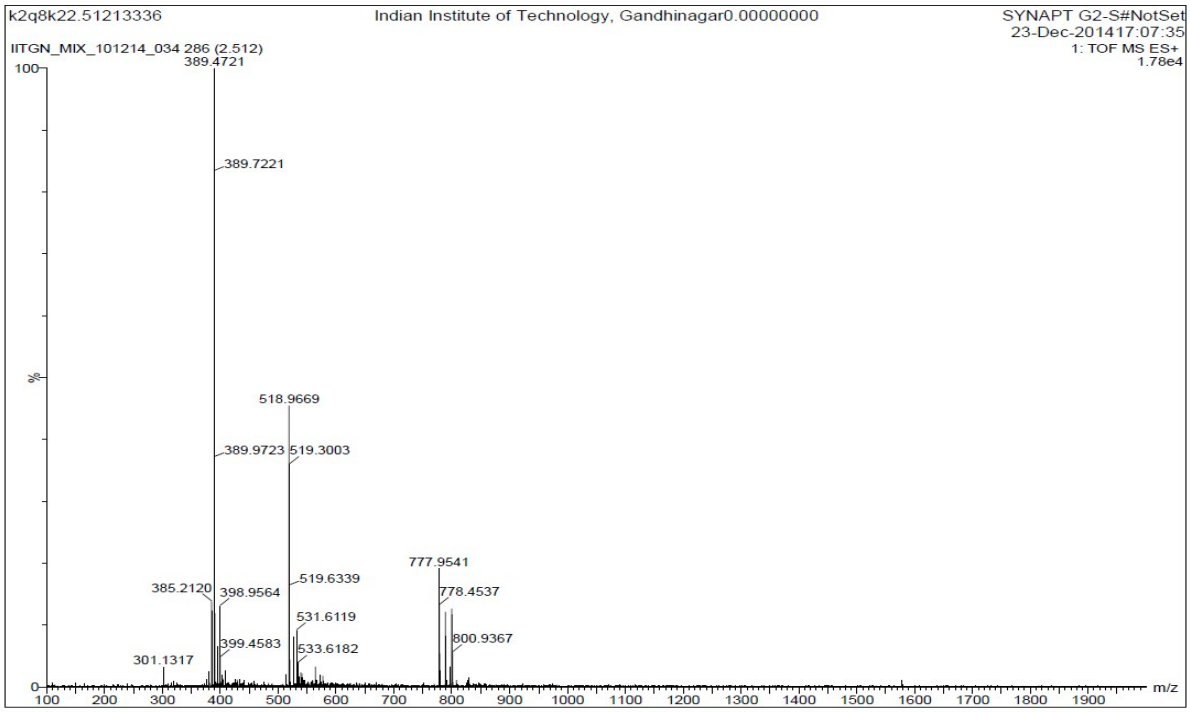
Time (Seconds)	A_t	A_t/A_{max}	$1-(A_t/A_{max})$	$\ln[1-(A_t/A_{max})]$
5	0.186225	0.270668	0.729332	-0.31563
10	0.229108	0.332995	0.667005	-0.404958347
20	0.262083	0.380923	0.619077	-0.479525285
30	0.33191	0.482413	0.517587	-0.658578235
45	0.38766	0.563443	0.436557	-0.828836152
60	0.457917	0.665557	0.334443	-1.095289425
120	0.590837	0.858749	0.141251	-1.957218682

Supplementary Figure 2. Deprotection kinetics for Fmoc release using 5% piperazine. $\ln[1-(A_t/A_{max})]$ was plotted against time (s) and a straight-line (y=mx+c) was fit assuming pseudo first order kinetics. Half-life was calculated using $t_{1/2} = 0.693/m$. A_t= absorbance at time t at 301 nm, A_{max} = final absorbance at 301 nm.

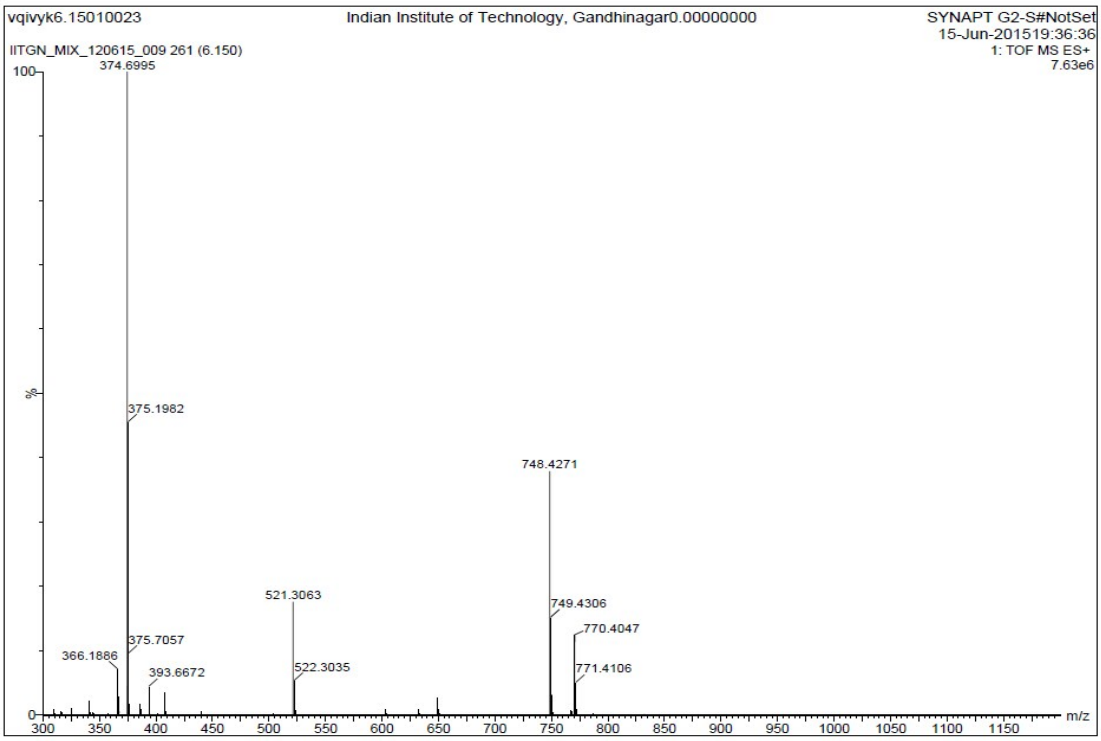


Supplementary Figure 3. Mass spectra of product and by-products obtained from $YA_{10}K$ synthesis corresponding to RP-HPLC chromatogram in Figure 2a.

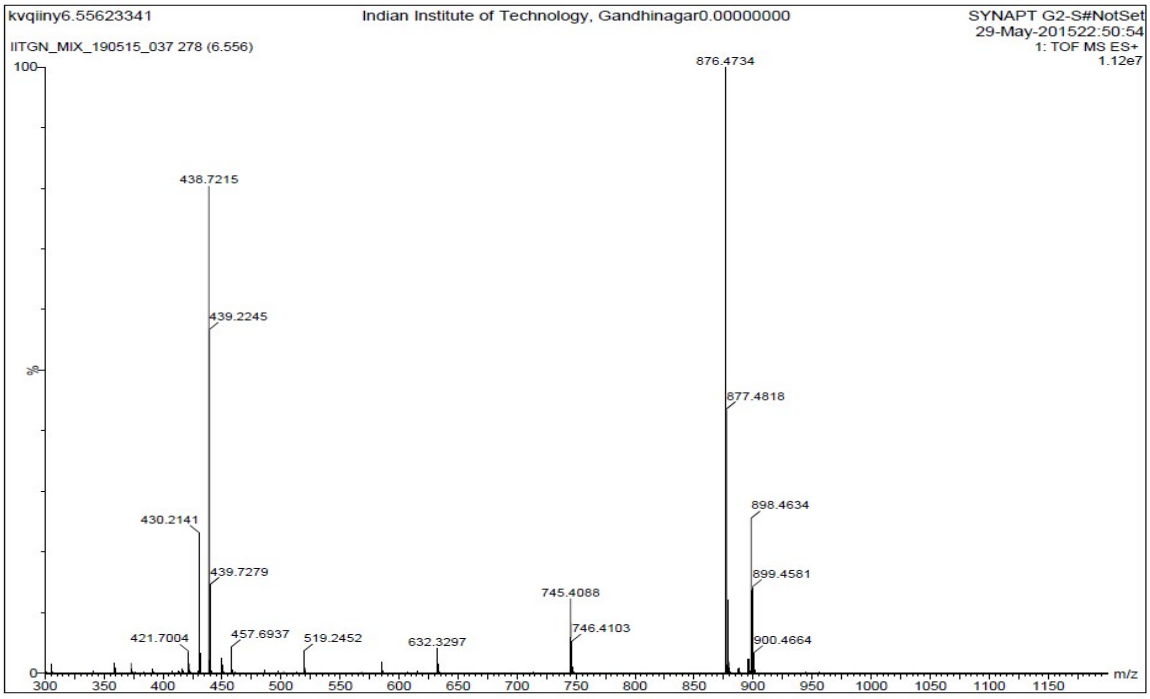
(a) PolyQ ($K_2Q_8K_2$)



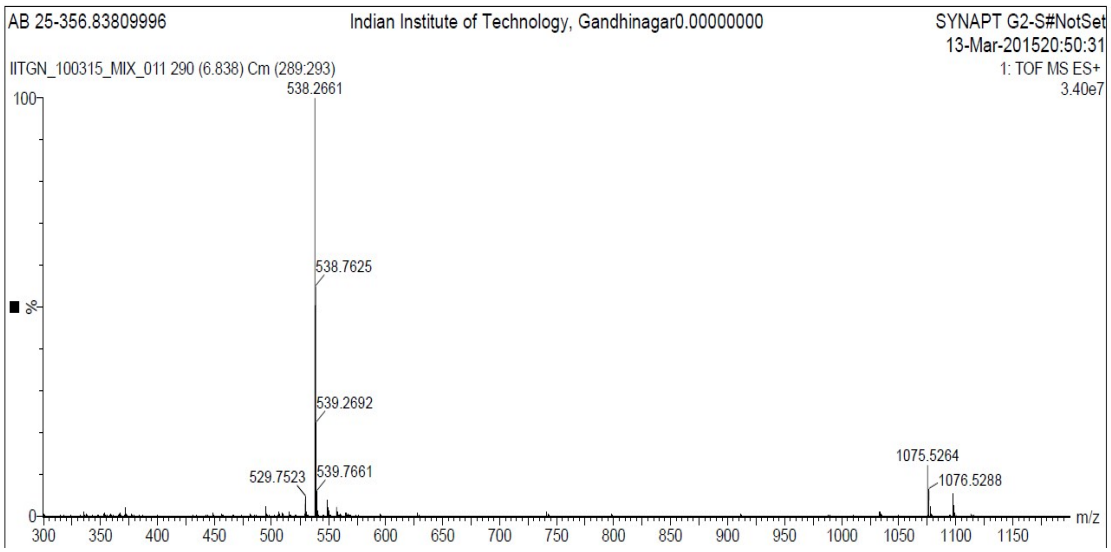
(b) PHF6 (VQIVYK)



(c) PHF6* (KVQIINY)

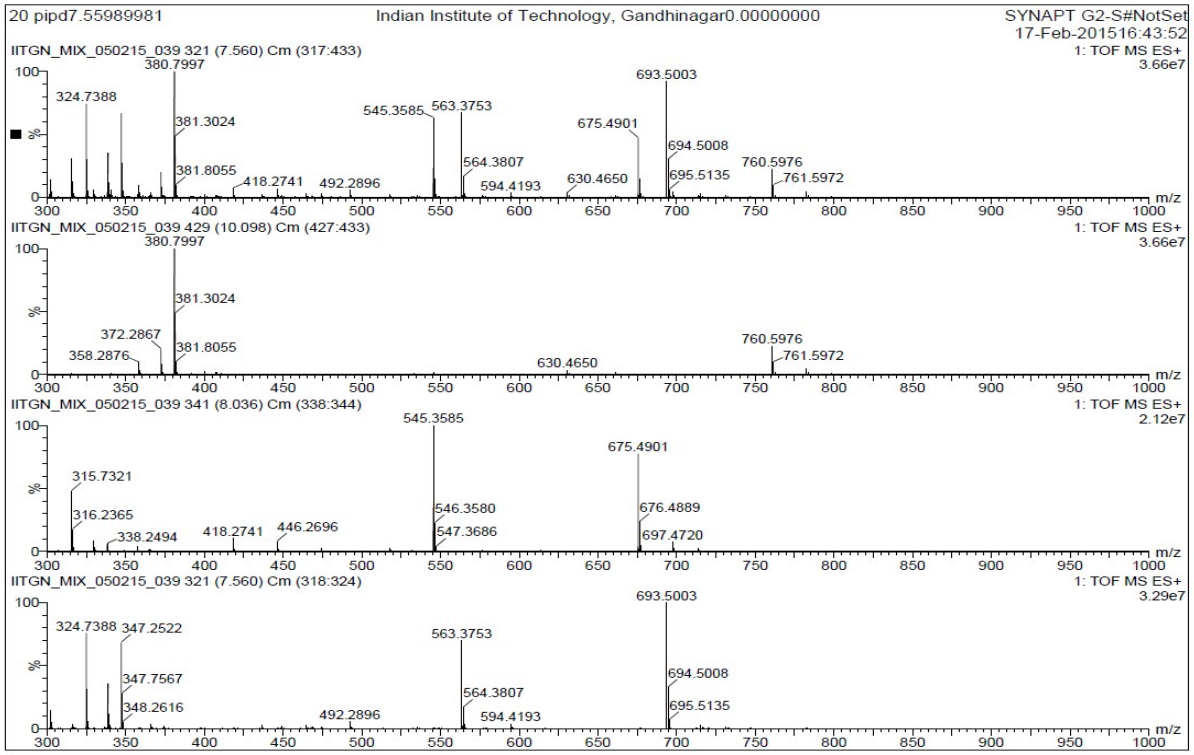


(d) $A\beta_{25-35}$ (GSNKGAIIGLM*)

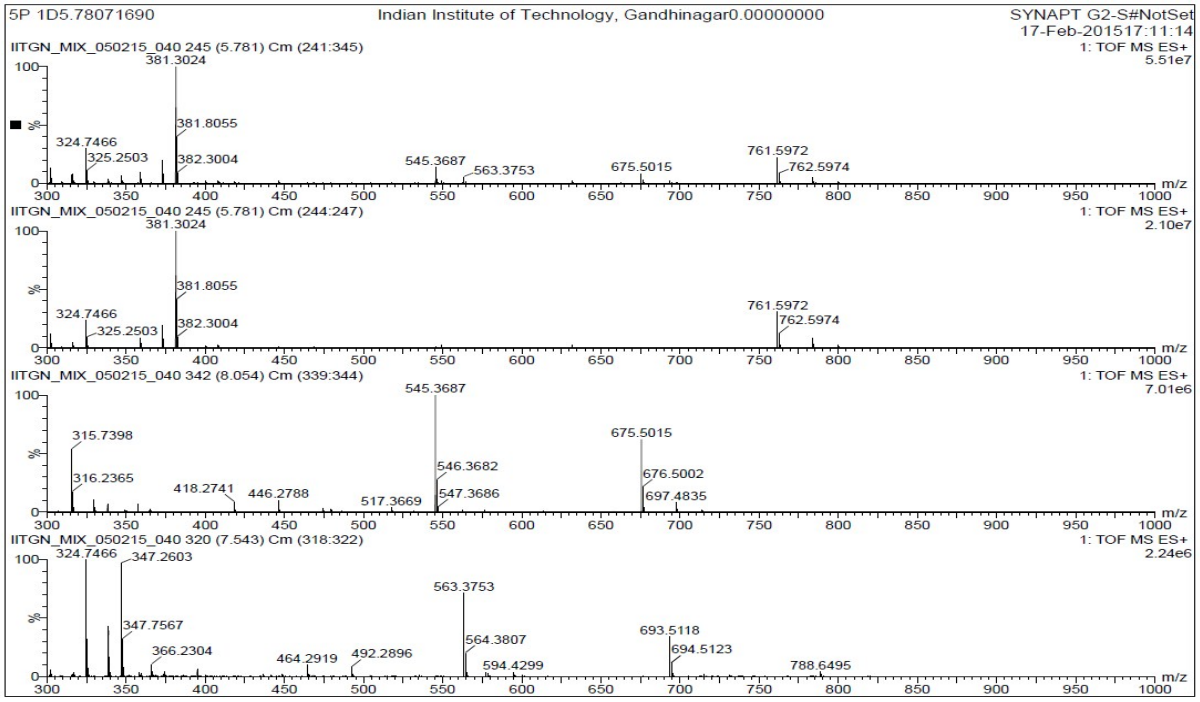


***** Oxidation of Methionine corresponds to M+16 peak

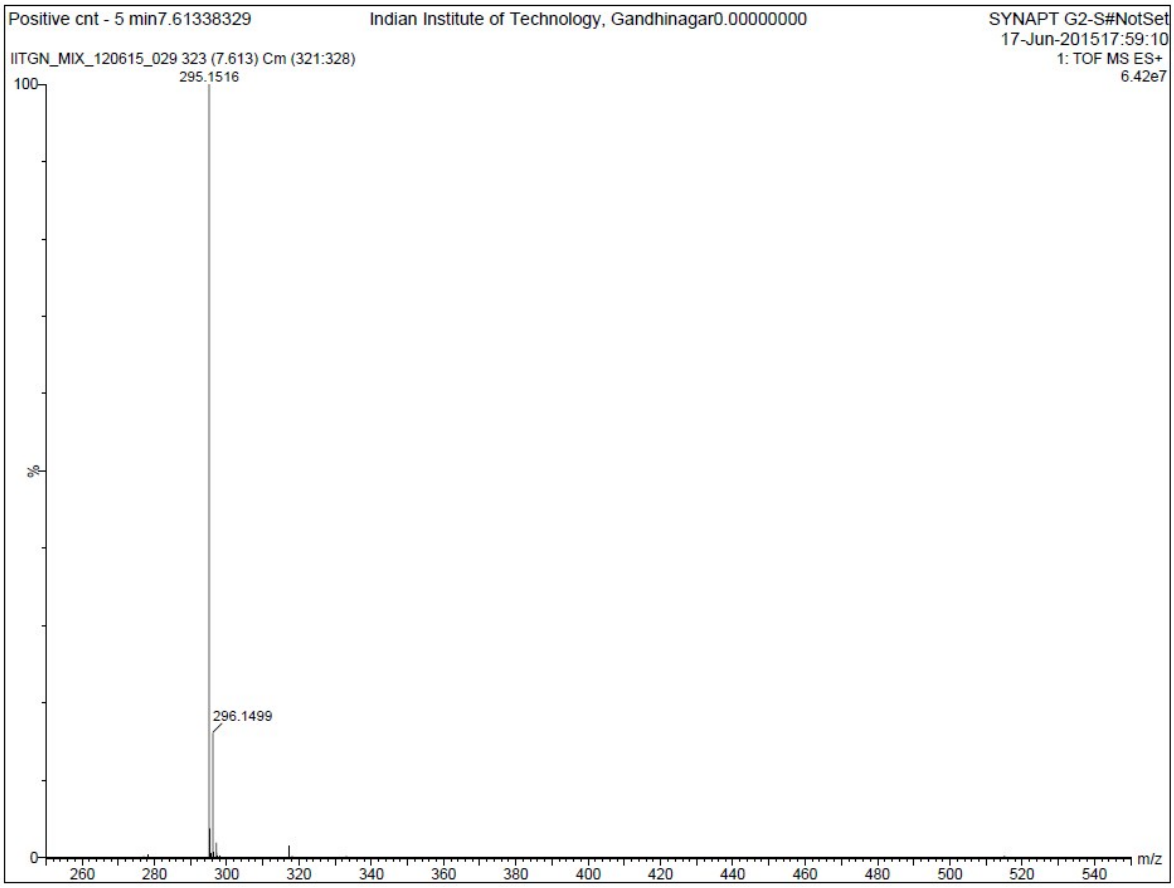
Supplementary Figure 4. Mass spectra of difficult peptide sequences synthesized using 5% piperazine + 2% DBU as deprotection solution. Post cleavage, samples were injected by direct TFA method as described in the experimental section (a) PolyQ (b) PHF6 (c) PHF6* (d) $A\beta_{25-35}$



Supplementary Figure 5. Mass spectra of VKDGYI after incubation of resin bound peptide in 20% piperidine corresponding to RP-HPLC chromatogram in Figure 3 (ii). Post cleavage, samples were injected by direct TFA method.



Supplementary Figure 6. Mass spectra of VKDGYI after incubation of resin bound peptide in 5% piperazine + 1% DBU corresponding to RP-HPLC chromatogram in Figure 3 (iv). Post cleavage, samples were injected by direct TFA method.



Supplementary Figure 7. Mass spectrum corresponding to RP-HPLC chromatogram (Figure 4) of Gly-Tyr(OtBu) di-peptide obtained after cleavage from 2-chlorotrityl chloride resin under mild acidic conditions.