Electronic Supplementary Material (ESI) for RSC Advances.

High concentration DNA solubility in bio-ionic liquids with long-lasting chemical and structural stability at room temperature

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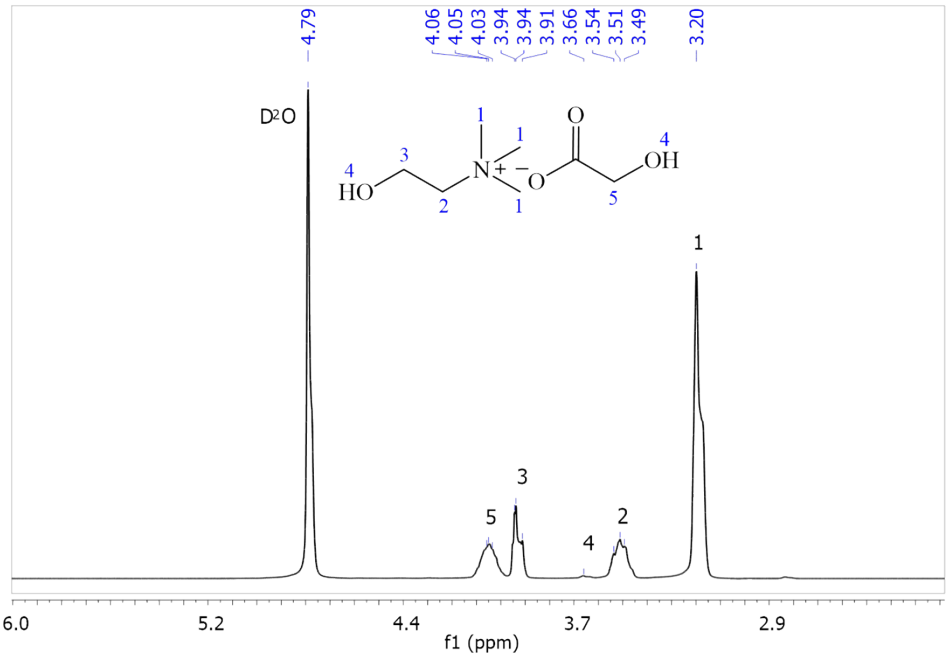


Figure S1: ^{1}H NMR spectra of Cho-glycolate ; ^{1}H NMR (D_2O, 200 MHz, δ/ppm relative to TMS): 3.2 (*s*, 9H, -N-CH_3), 3.51 (*t*, 2H, -CH_2-N-), 3.66 (*s*, 2H, -OH), 3.94 (*t*, 2H, -O-CH_2-), 4.05 (*t*, 2H, -CO-CH_2-O-).

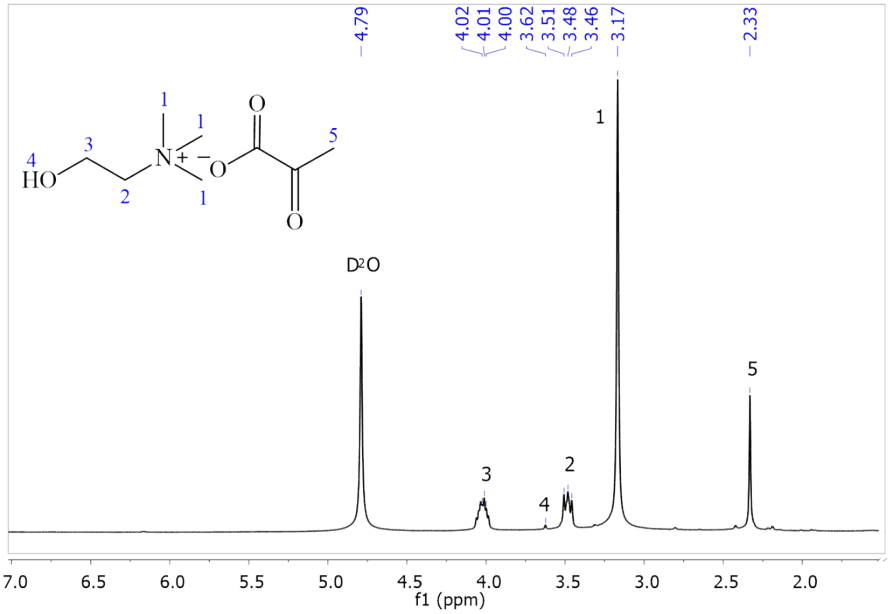


Figure S2: ^{1}H NMR spectra of Choline pyruvate ; ^{1}H NMR (D_2O, 200 MHz, δ/ppm relative to TMS): 2.33 (*s*, 3H, -CH_3), 3.17 (*s*, 9H, -N-CH_3), 3.48 (*t*, 2H, -CH_2-N-), 3.62 (*s*, 1H, -OH), 4.01 (*t*, 2H, -O-CH_2-).

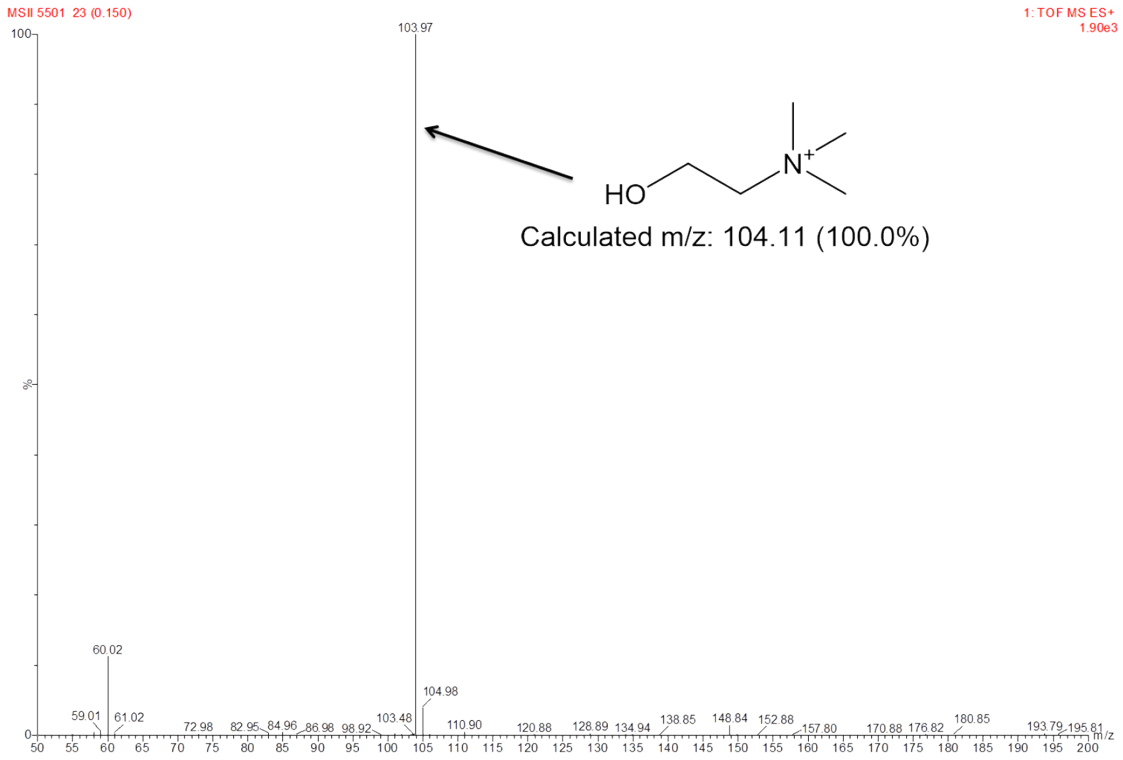


Figure S3: ESI-MS spectra of Choline glycolate in ES (+)ve mode.

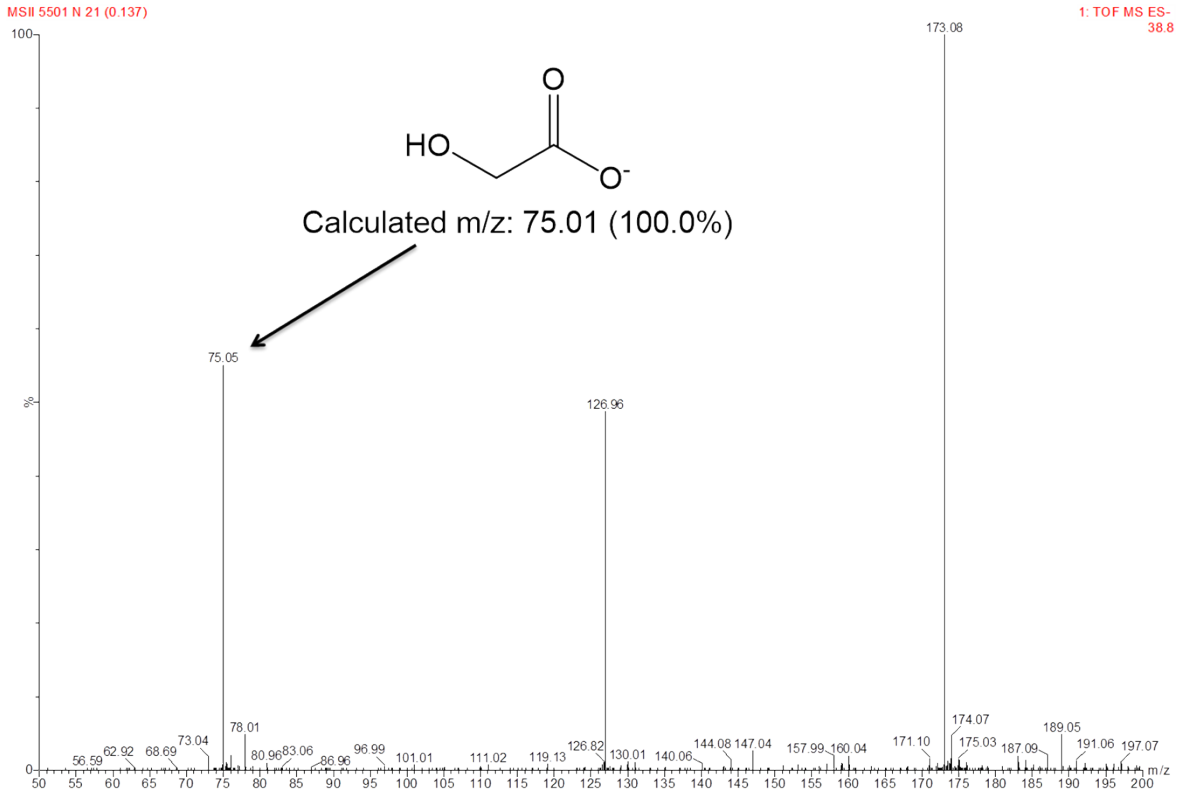


Figure S4: ESI-MS spectra of Choline glycolate in ES (-)ve mode.

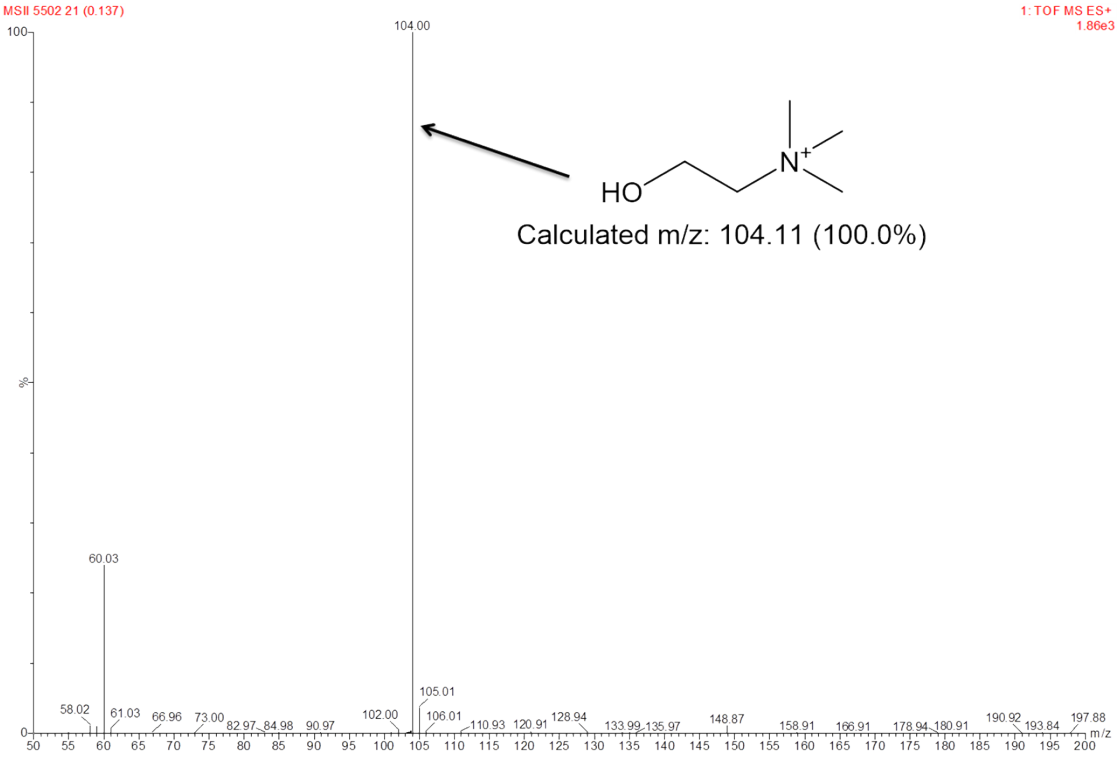


Figure S5: ESI-MS spectra of Choline pyruvate in ES (+)ve mode.

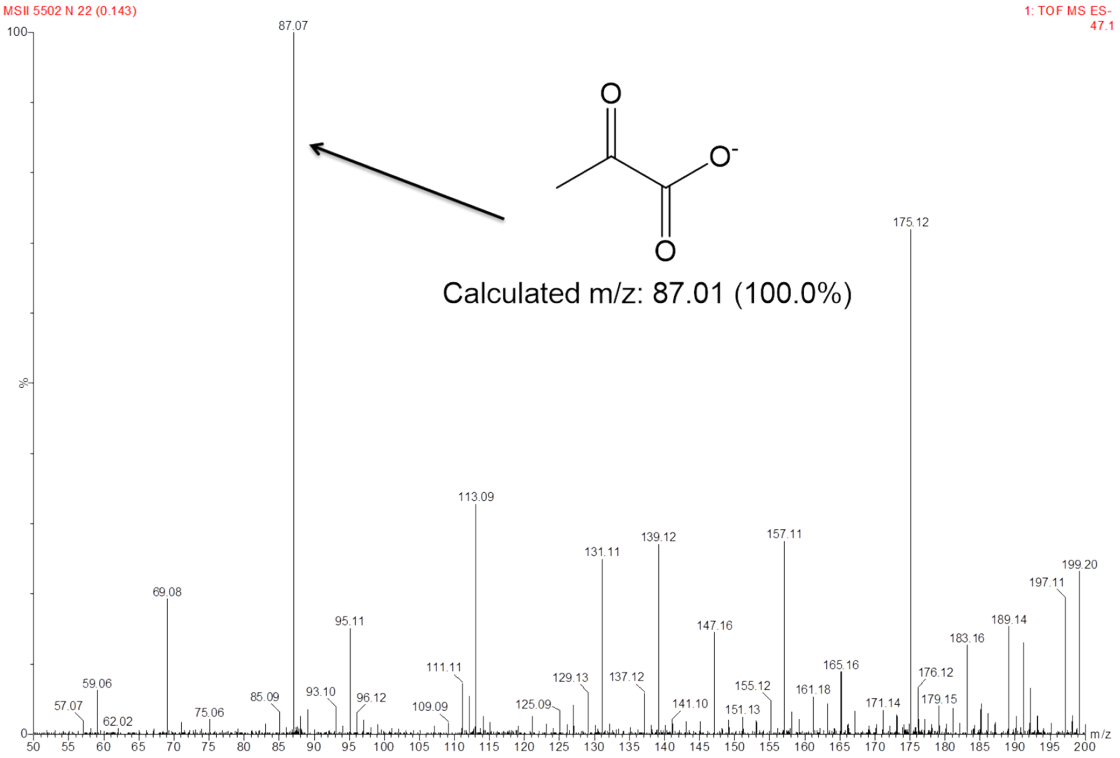


Figure S6: ESI-MS spectra of Choline pyruvate in ES (-)ve mode.

Table S1: The physiochemical parameters of bio-ILs used in this study

Parameters	Bio-ionic liquid	
	Cho-Gly	Cho-Pyr
Viscosity (mPa.s) at 25 °C	93.7	204.7
Density (gm.cm^{-3})	1.204	1.186
T_g (°C)	-98.4	-98.8
T_m (°C)	16.0	16.6
T_{dec} (°C)	256	230
Moisture contents (*wt* %)	1.65	1.81

Note: T_g = Glass transition temperature; T_m = Melting temperature; T_{dec} = Decomposition temperature.

Figure S7: Digital photographs of Cho-Gly after dissolution of DNA in different concentrations (A) 2 *wt* %, (B) 4 *wt* %, (C) 6 *wt* %, (D) 8 *wt* %, and (E) 10 *wt* %.

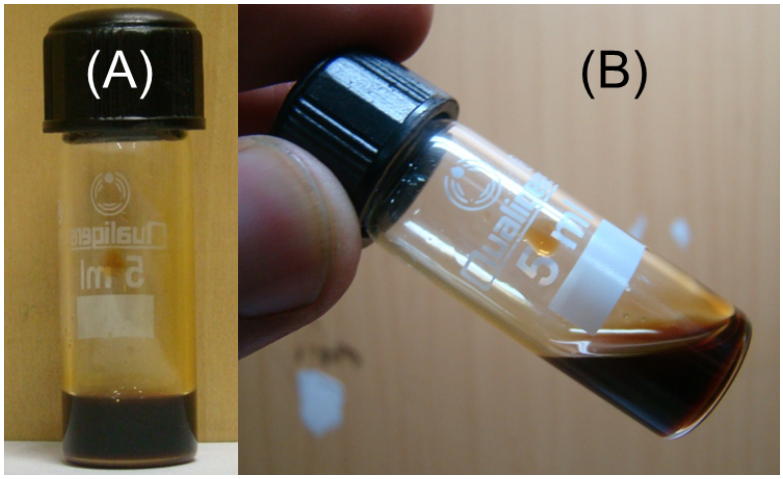


Figure S8: Optical images of Cho-Pyr (A) and Cho-Pyr after dissolution of 2 *wt* % DNA (B).

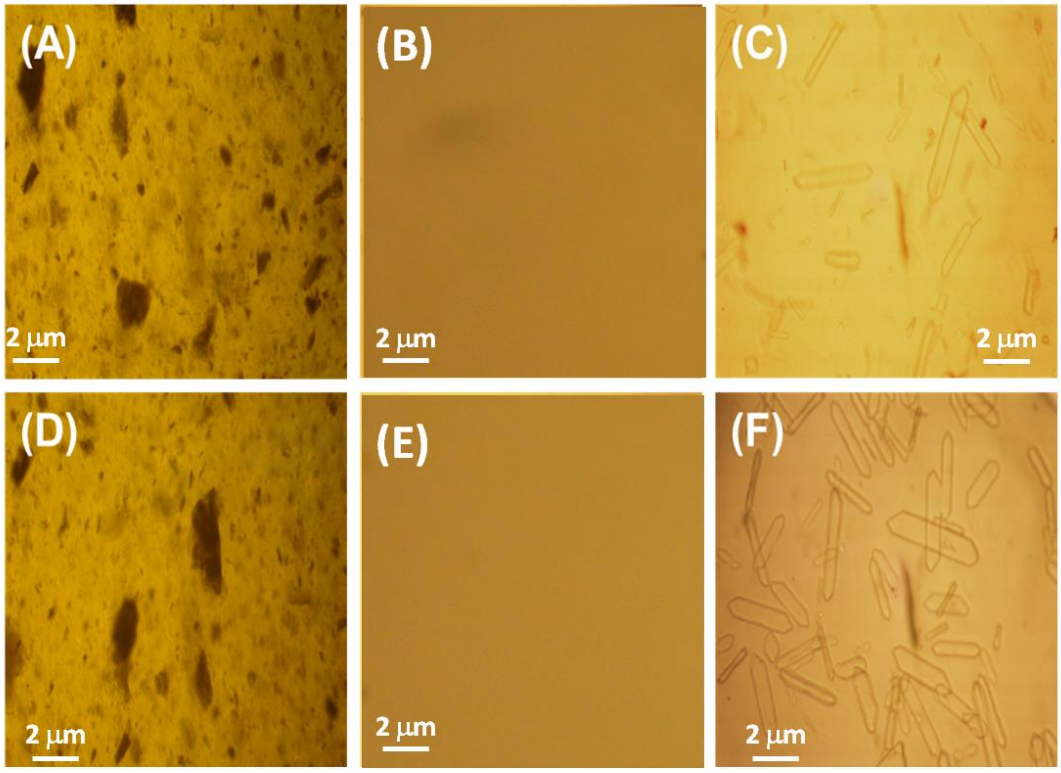


Figure S9: Phase contrast optical micrograph of (A) DNA in Cho-Gly (at 0 minute) (B) 8 % *w/w* DNA in Cho-Gly after complete dissolution (C) 10 % *w/w* DNA in Cho-Gly (after 48 h), (D) DNA in Cho-Pyr (at 0 minute), (E) 2 % w/w DNA in Cho-Pyr after complete dissolution, and (F) 4 % DNA in Cho-Pyr (after 48 h).

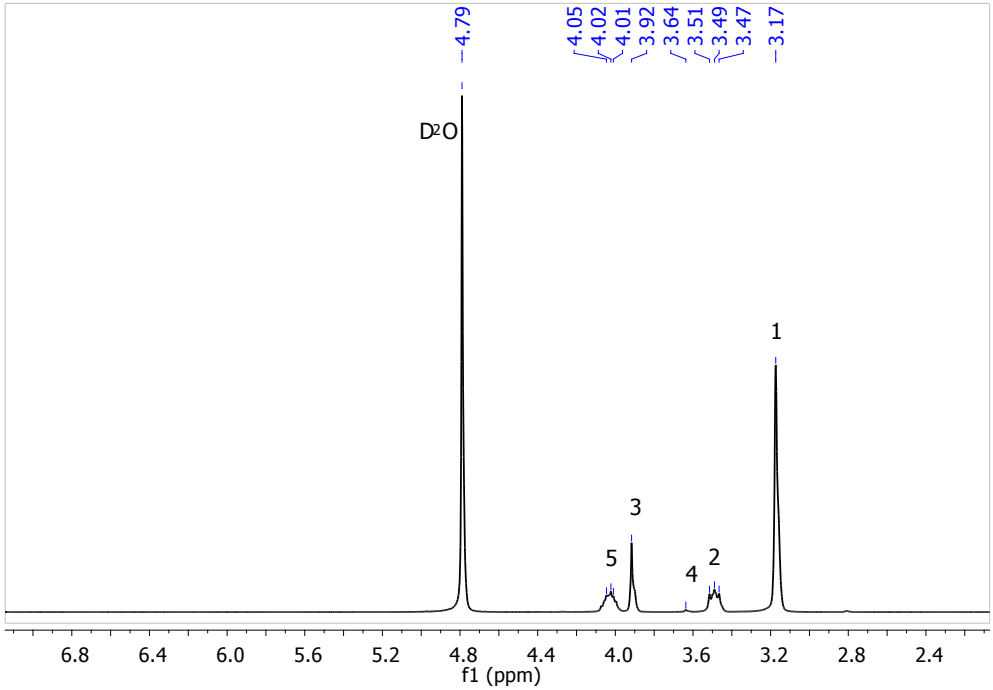


Figure S10: ^{1}H NMR spectra of recovered Choline glycolate

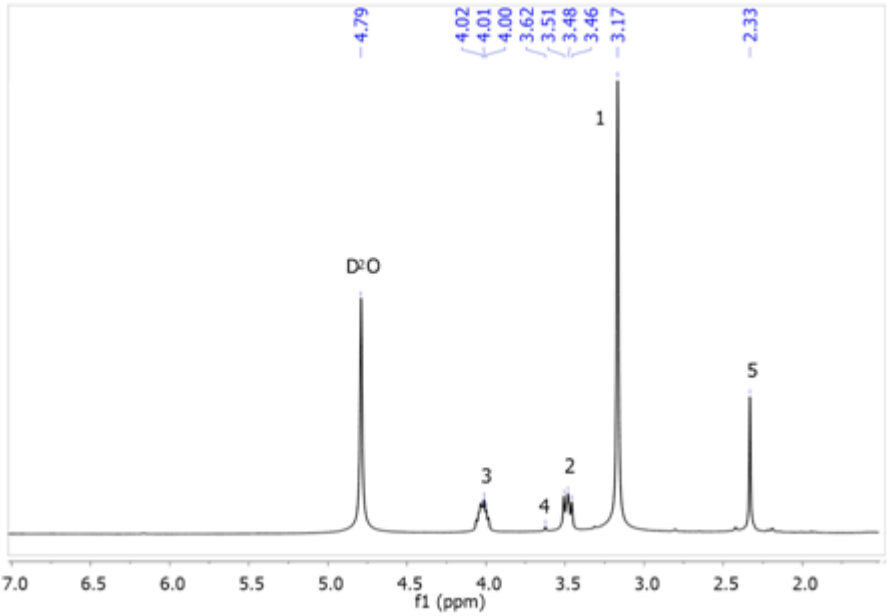


Figure S10: ^{1}H NMR spectra of recovered Choline pyruvate

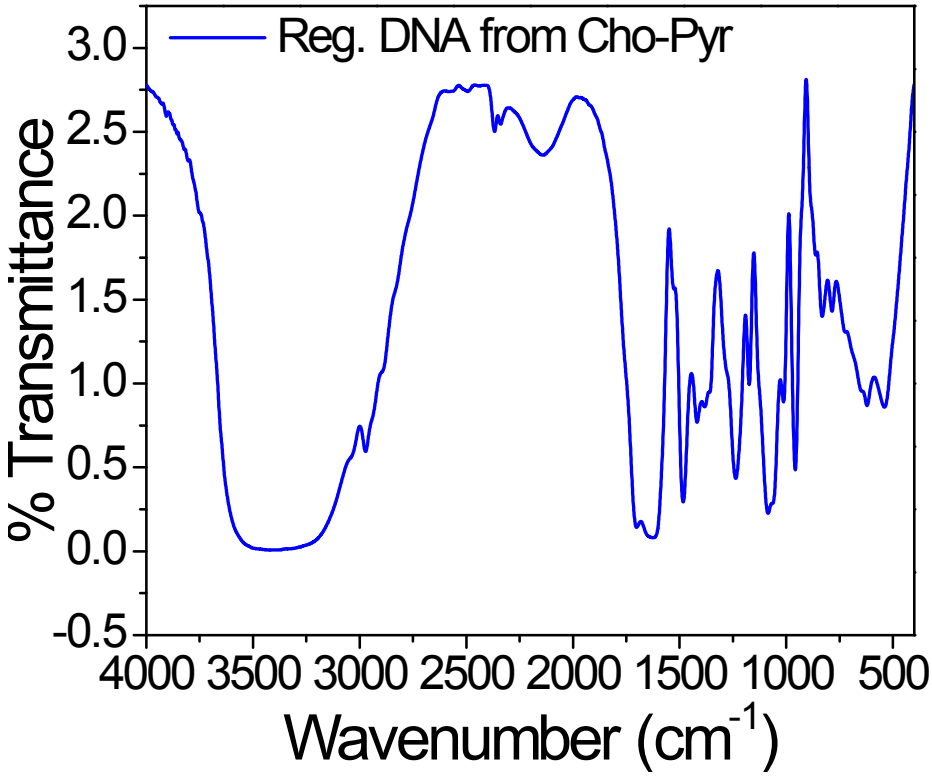


Figure S11: FT-IR spectra of regenerated DNA from Cho-Pyr.

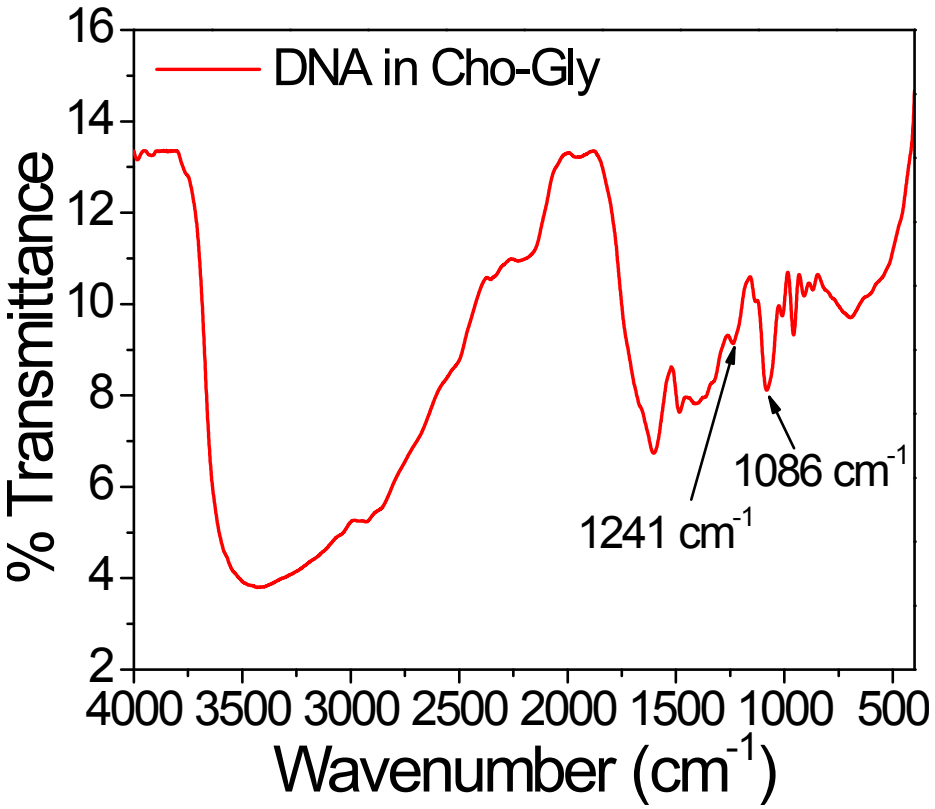


Figure S12: FT-IR spectra of DNA in Cho-Gly solution.

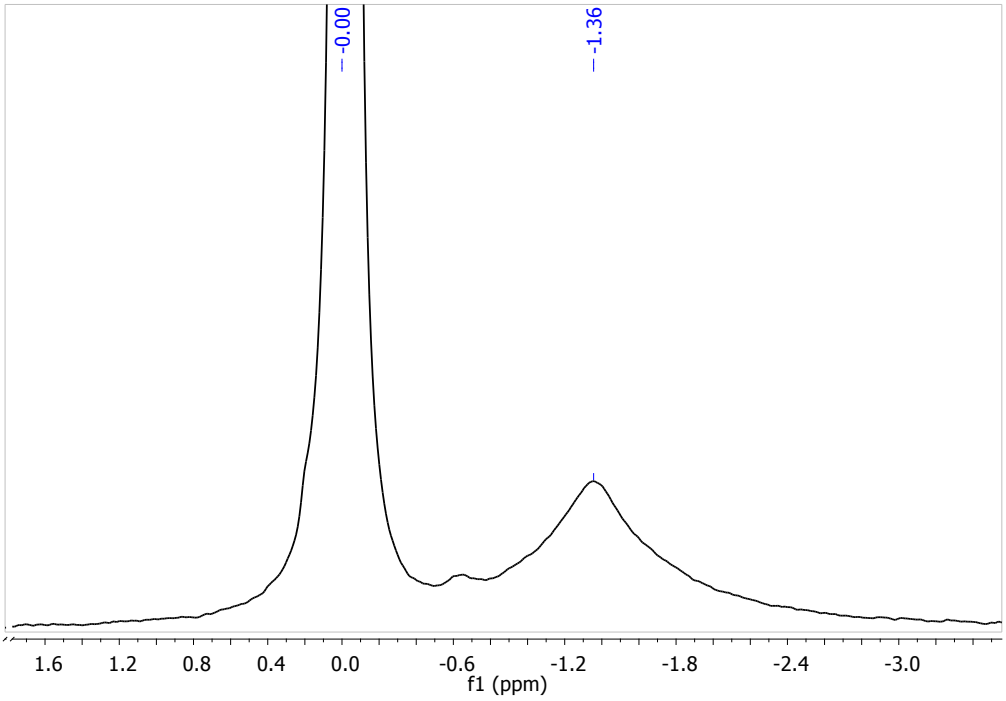


Figure S13: ^{31}P NMR spectra of DNA in Cho-Gly using ortho-phosphoric acid as internal standard.

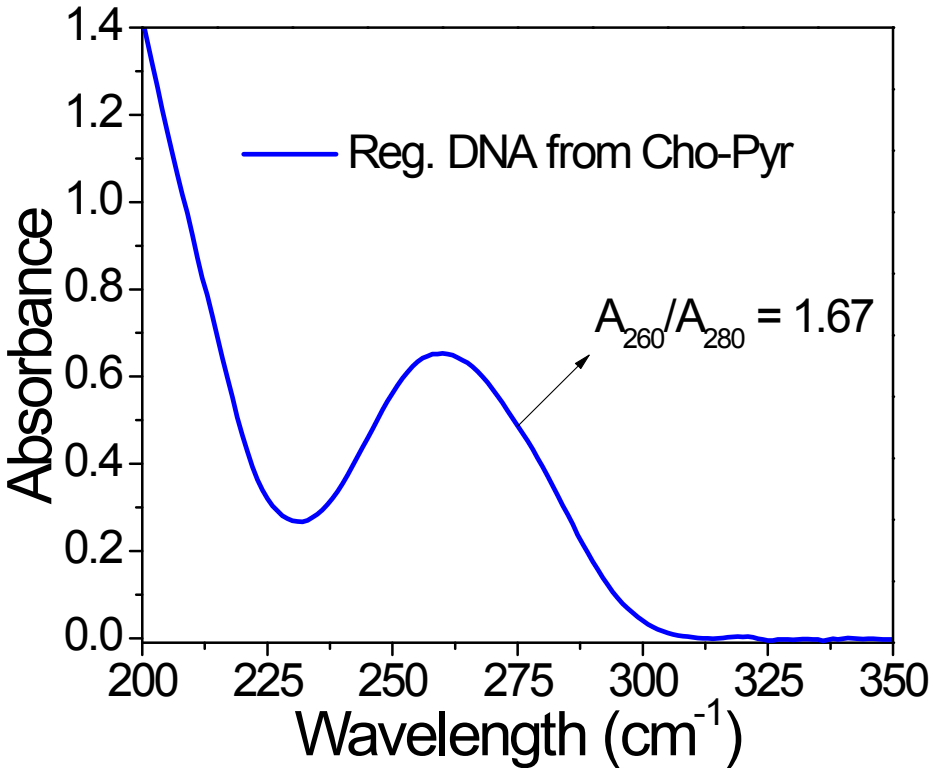


Figure S14: UV-Vis spectra of regenerated DNA (6.0 x 10^{-5} mol.L^{-1}) from Cho-Pyr.

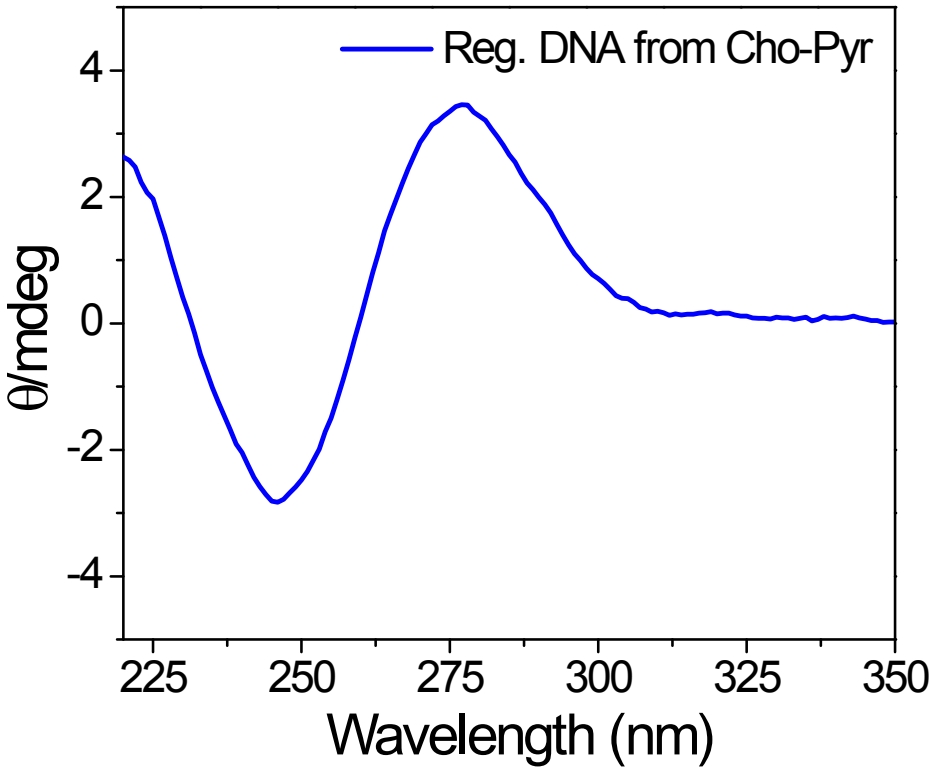


Figure S15: CD spectra of regenerated DNA (6.0 x 10^{-5} mol.L^{-1}) from Cho-Pyr.

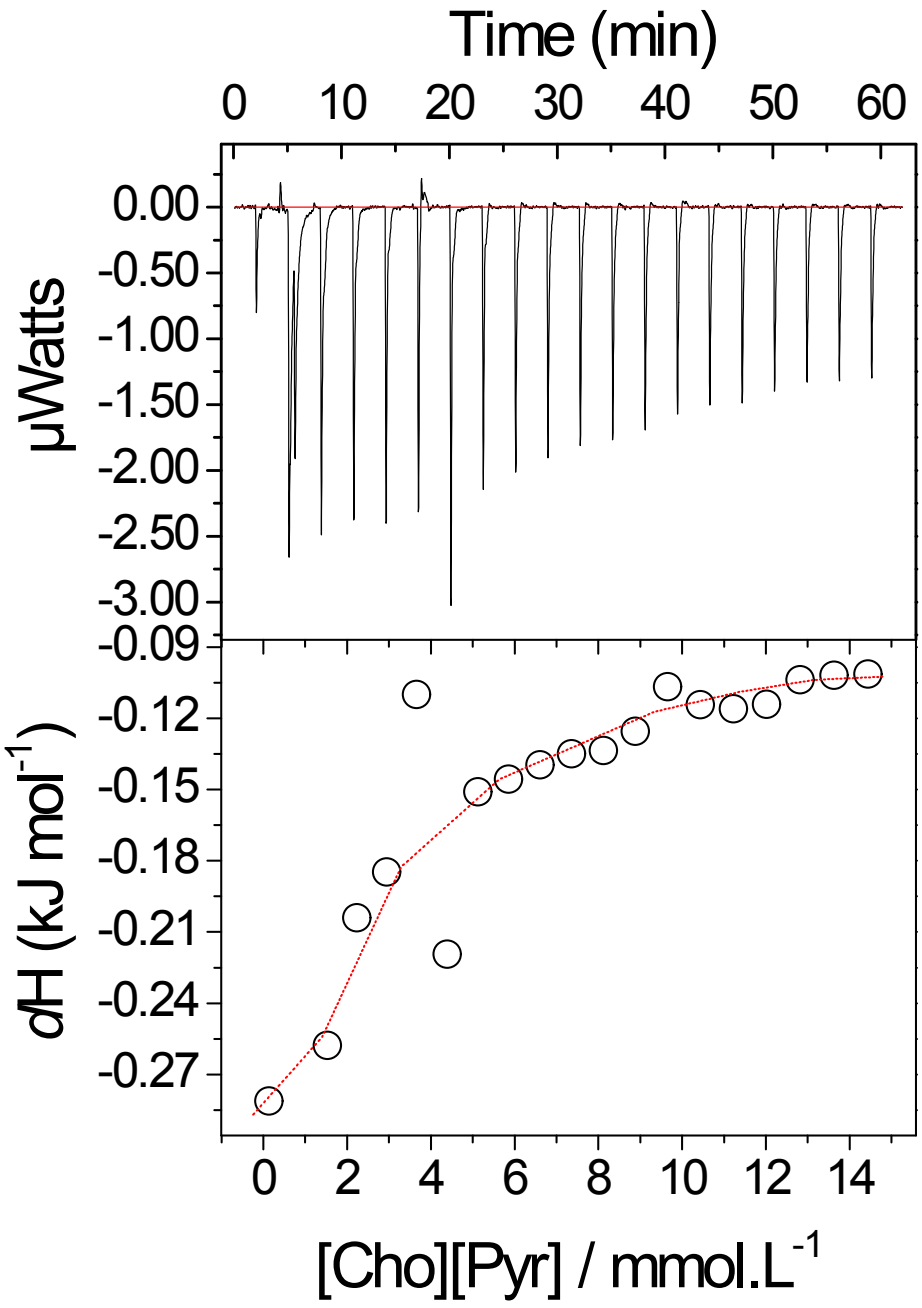


Figure S16: Isothermal titration calorimetric (ITC) plot for titration of 600 µL of 5.0 x 10^{-5} mol.L^{-1} DNA solution in tris-HCl buffer with successive addition of 2 µL of 0.1 mol.L^{-1} Cho-Pyr solutions at 298.15 K.

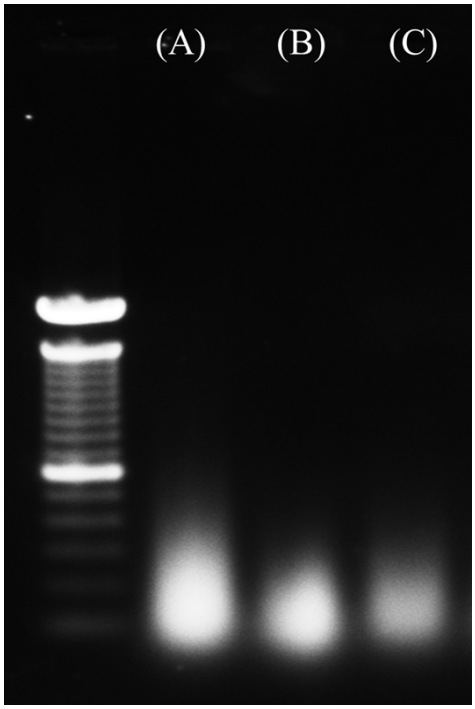
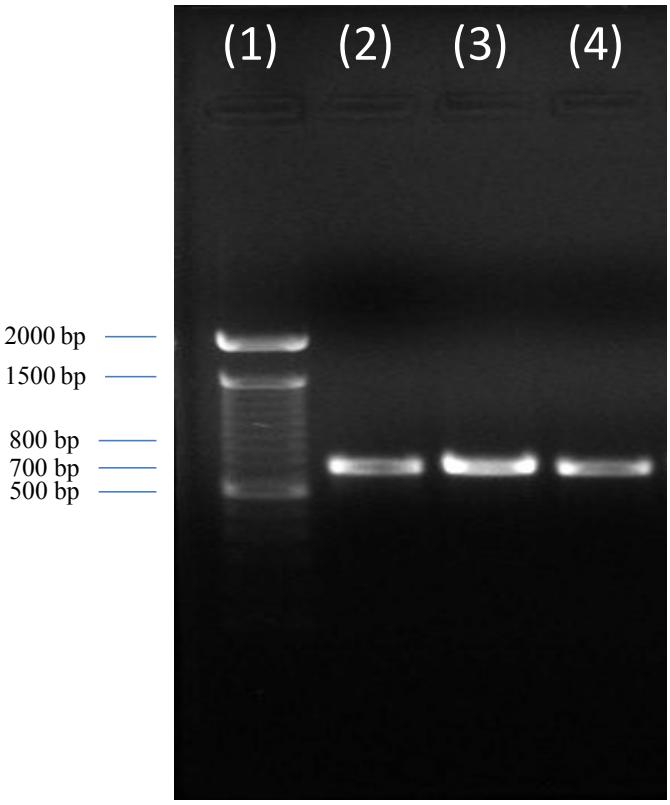


Figure S17: Agarose gel electrophoresis of standard salmon testes DNA (A) and regenerated DNA from Cho-Gly (B) and Cho-Pyr (C).



1 = Marker, 2 : standard DNA ; 3 : DNA recovered from Cho-Gly and 4 : DNA recovered from Cho-Pyr

Fig. S18: The PCR amplification of the standard and regenerated *Ulva* genomic DNA