Supplementary materials:

Conformational Distributions and Hydrogen Bonding in Gel and Frozen Lipid Bilayers: A High Frequency Spin-Label ESR Study.

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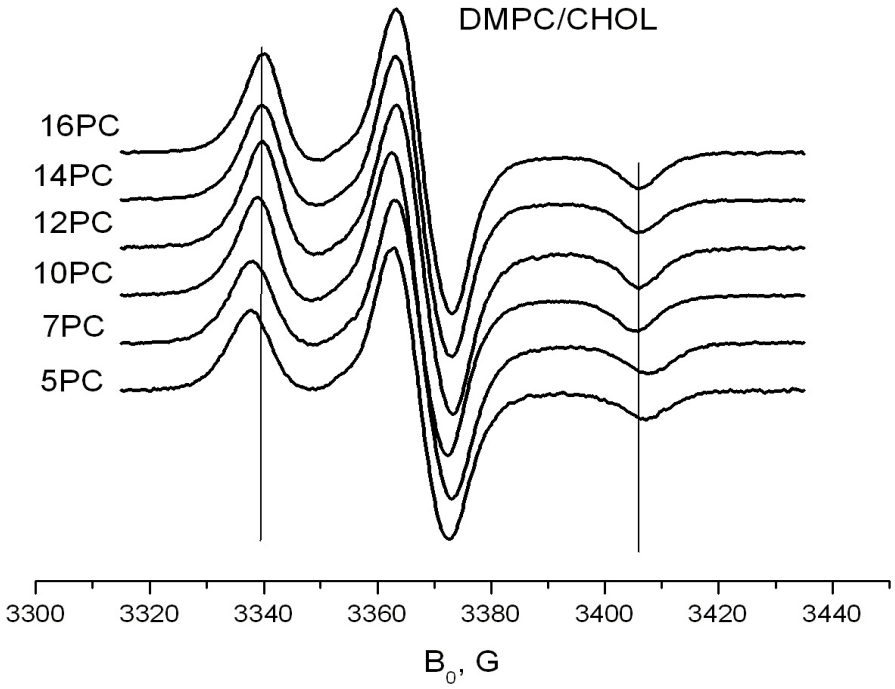
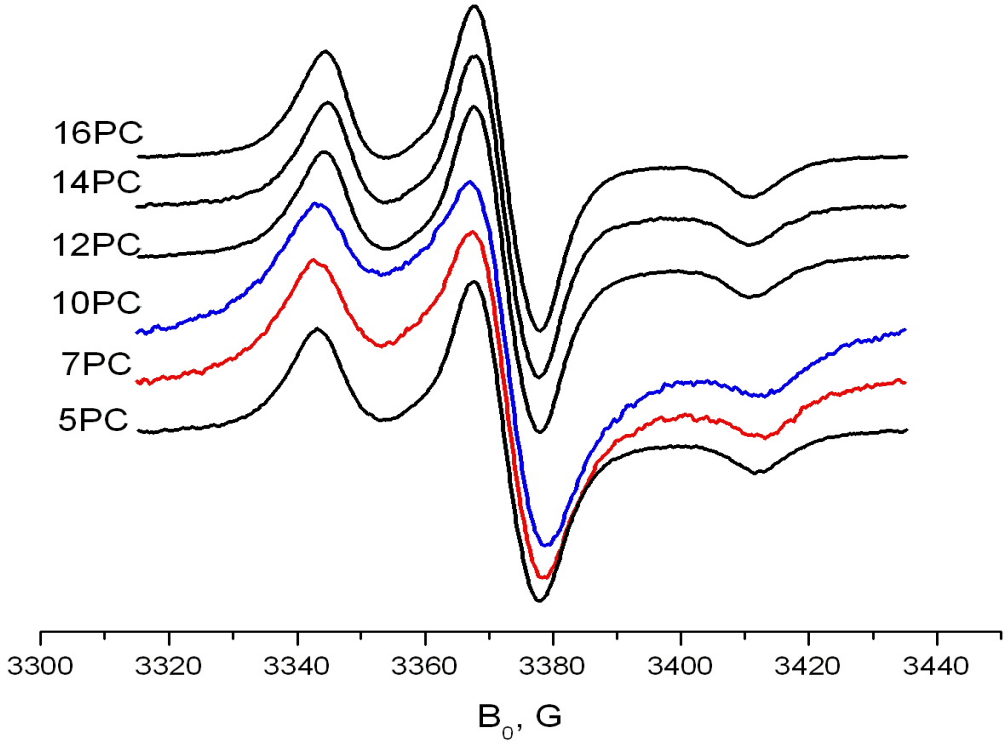
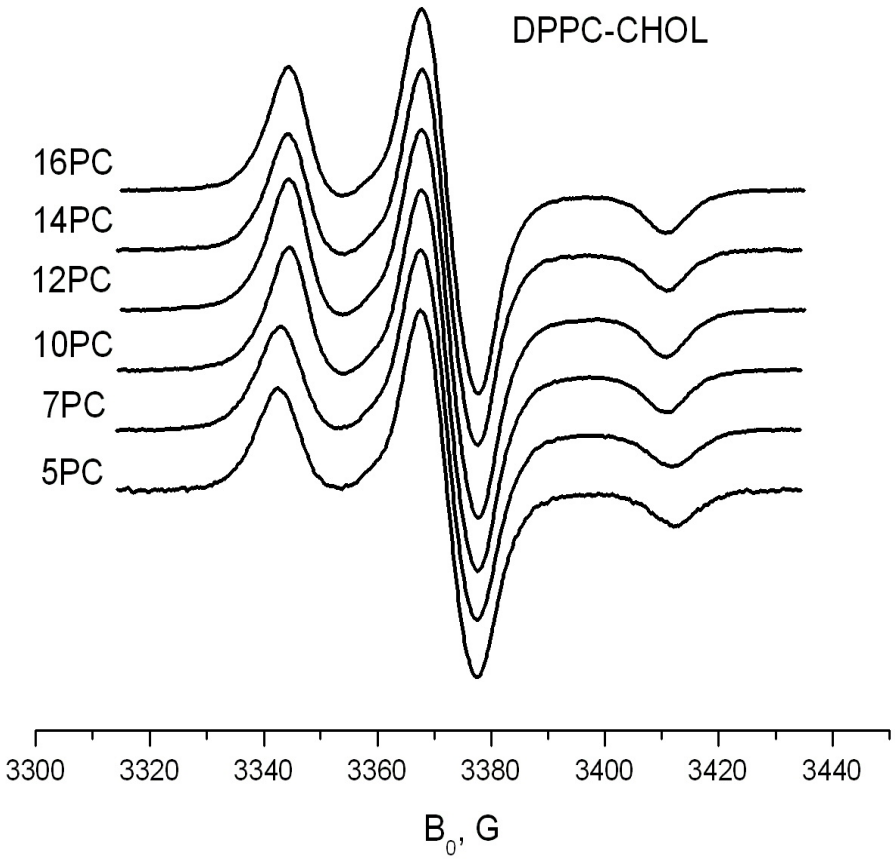
Suppl Fig. 1A: PC spin labels in DMPC/Cholesterol at 77K. Note a regular decrease in $2A_{zz}$ with the increasing PC number.



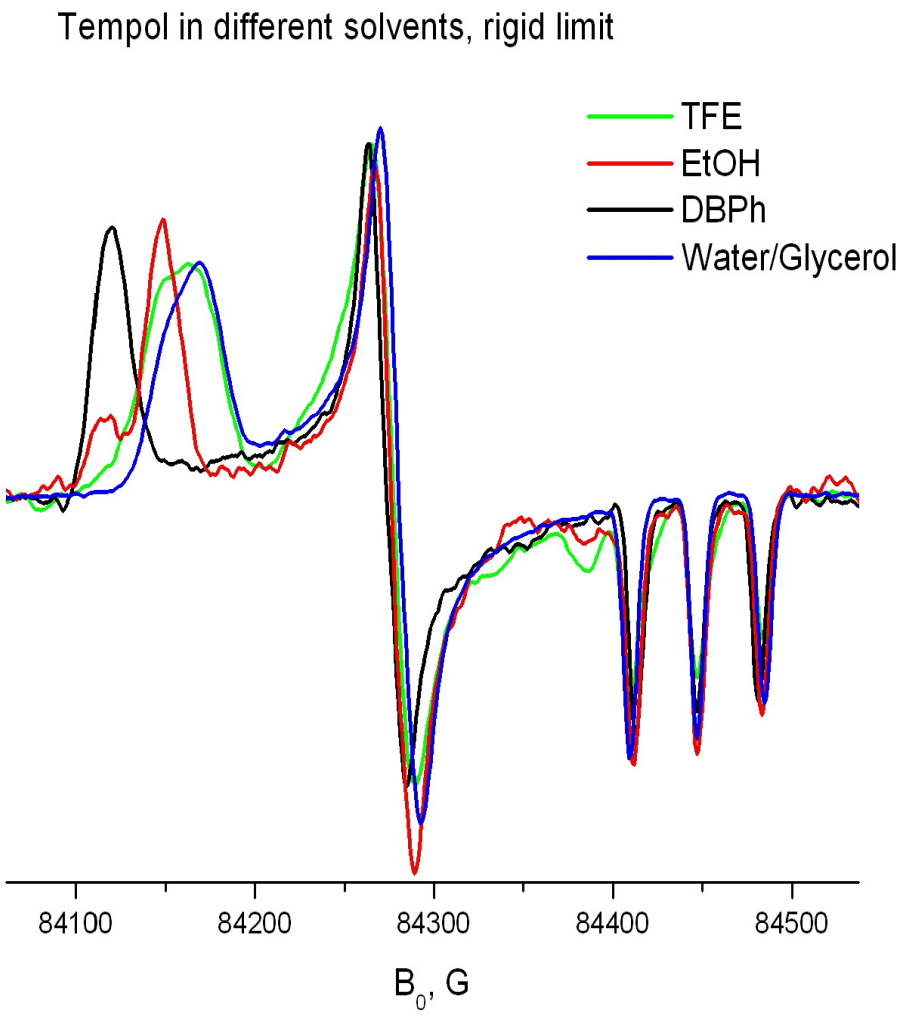
Suppl. Fig. 1B PC spin labels in DPPC at 77K. Spectra of 7PC and 10 PC with most broadening are shown in color.



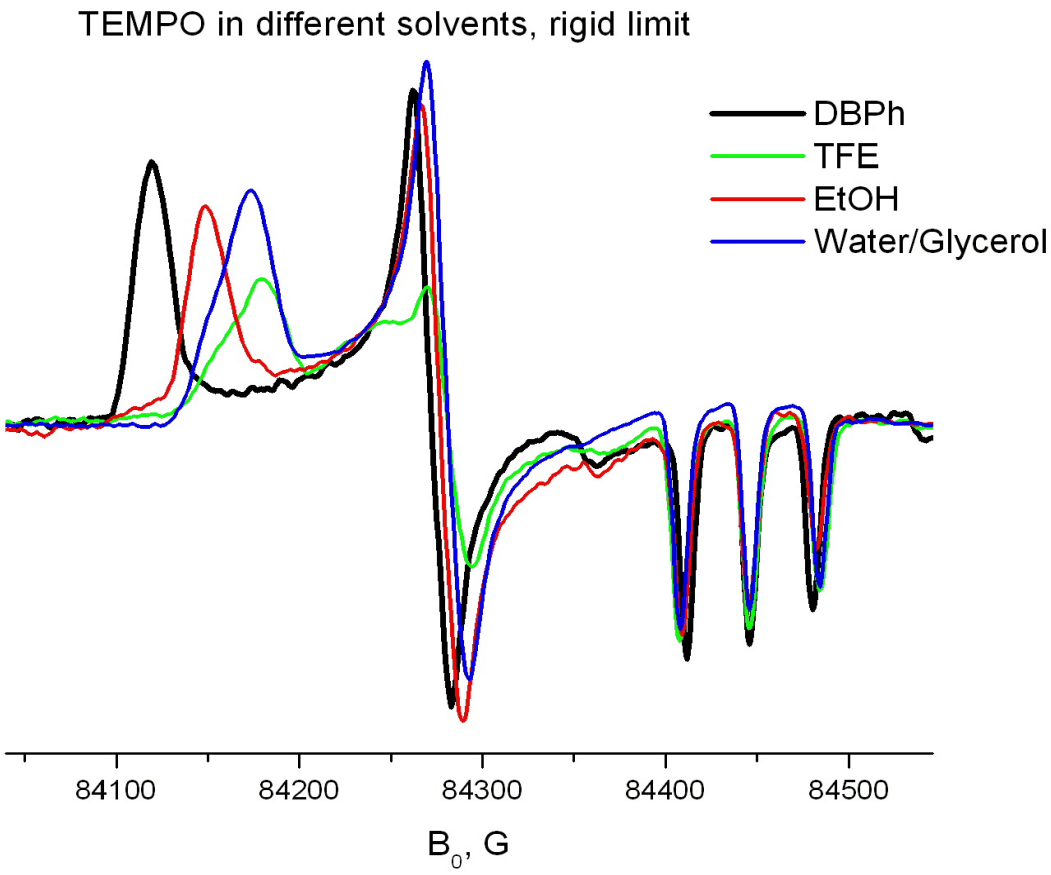
Suppl Fig. 1C PC spin labels in DPPC/Cholesterol at 77K. The spectra are almost identical to DMPC/Chol system.



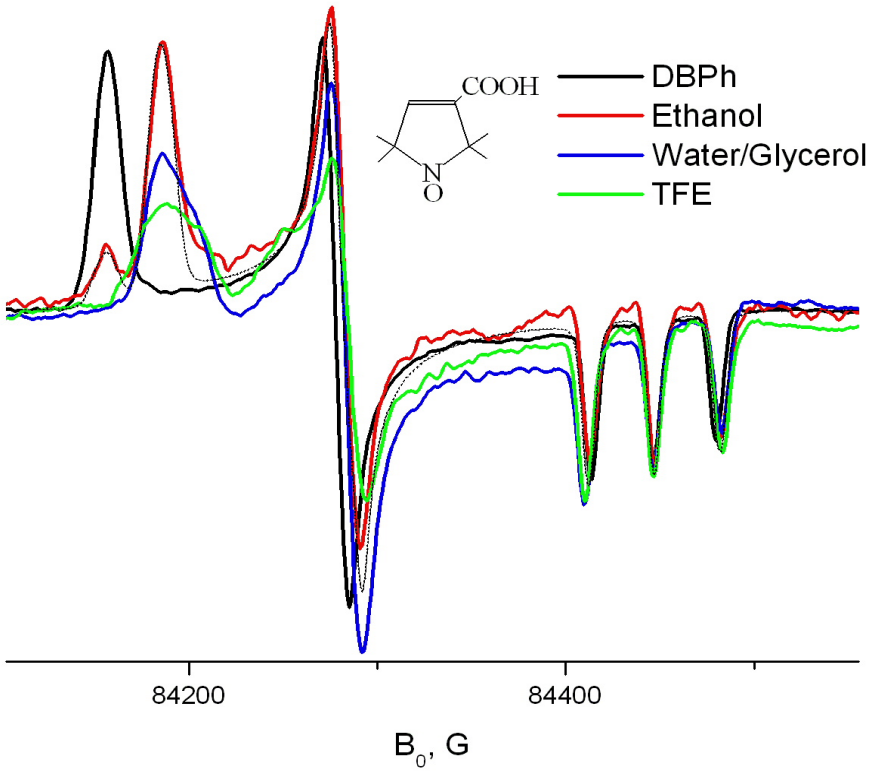
Suppl. Fig 3A. 4-hydroxy-TEMPO (TEMPOL) in a series of glass-forming solvents at 80-85K.



Suppl Fig 3B. TEMPO in a series of glass-forming solvents at 80-85K.



Suppl Fig. 3C. 2,2,5,5-Tetramethyl-3-pyrrolin-1-oxyl-3-carboxylic acid free radical in a series of glass-forming solvents at 80-85K. Black dotted line is a two-component rigid simulation of the ethanol spectrum.



Supplement Fig. 4: determination of the hydrogen bonding constant for TEMPO and TEMPONE by X-band ESR from the hyperfine splitting component A_{zz} measured at 77K. The estimates of $0.3M^{-1}$ for TEMPO and $0.5M^{-1}$ for TEMPONE should be taken as lower estimates. For a more exact estimate a linear slope describing the dependence of the hyperfine splitting constant on the dielectric constant of the solvent mixture should be subtracted from the curve. It should make the curves somehow steeper and give larger values of the equilibrium constants