

# <sup>1</sup>H-Detected REDOR with Fast Magic-Angle Spinning of a Deuterated Protein

Manali Ghosh, Chad M. Rienstra\*

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Department of Chemistry, University of Illinois at Urbana-Champaign, 600 South Mathews Avenue, Urbana, IL 61801, USA

Email: [rienstra@illinois.edu](mailto:rienstra@illinois.edu)

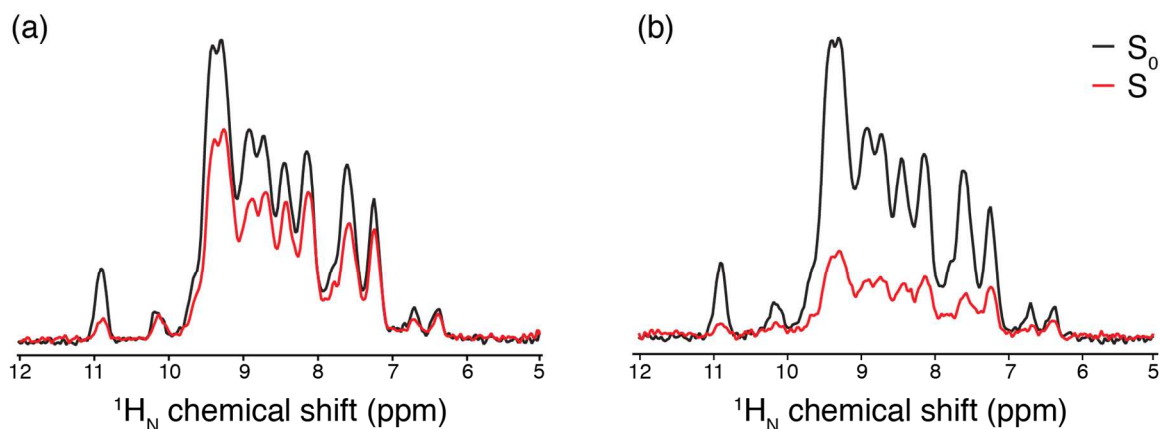
Phone: 217 244-2655 and Fax: 217-244-3186

Chad M. Rienstra

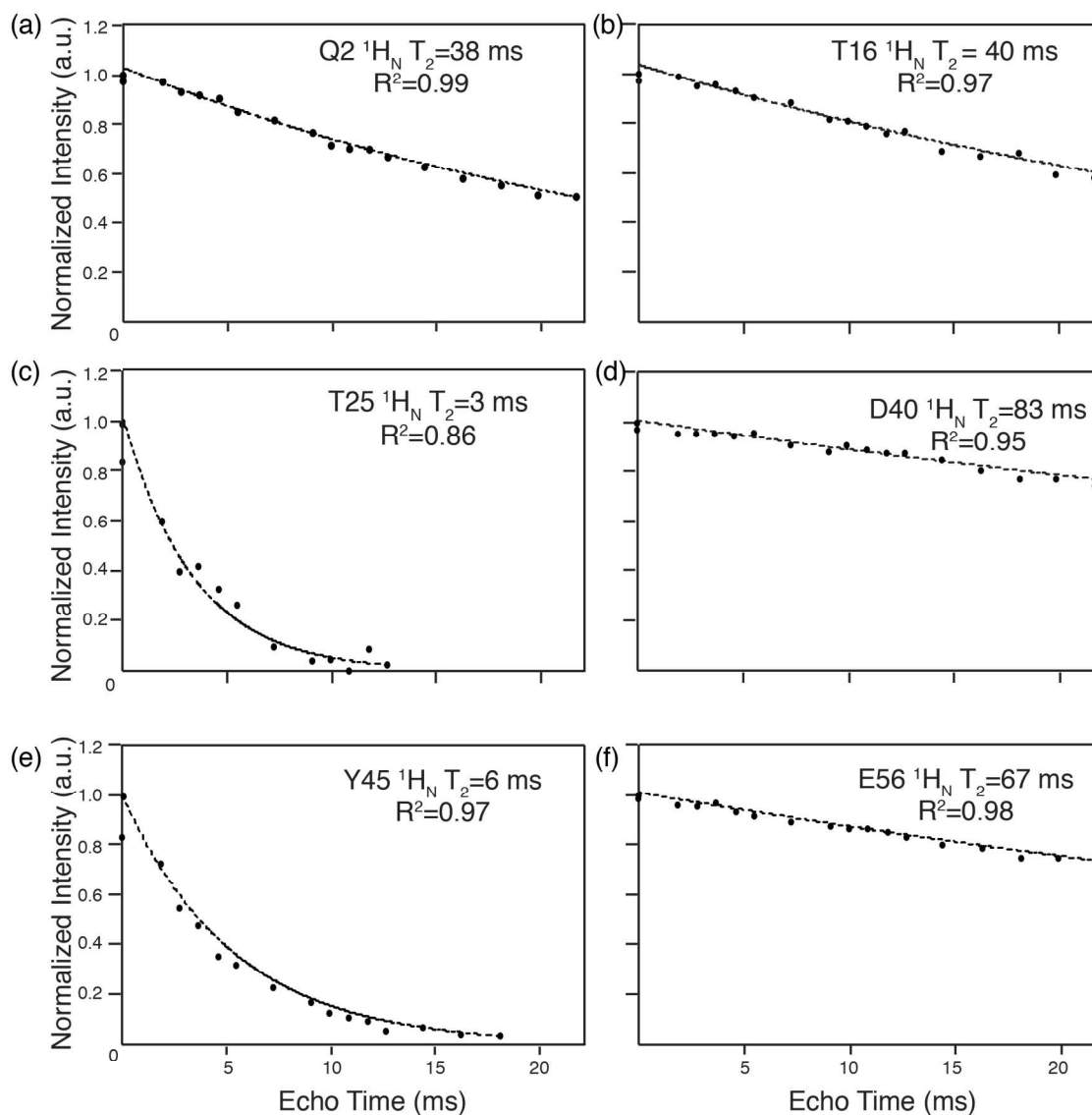
Center for Biophysics and Quantitative Biology, University of Illinois at Urbana-Champaign, 600 South Mathews Avenue, Urbana, IL 61801, USA

Chad M. Rienstra

Department of Biochemistry, University of Illinois at Urbana-Champaign, 600 South Mathews Avenue, Urbana, IL 61801, USA



**Figure S1:** Application of REDOR  $\pi$ - pulses on different channels ( $^1\text{H}$  or  $^{13}\text{C}$ ). The  $^1\text{H}_\text{N}$  1D spectra on uniformly  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$  labeled GB1 are shown when the REDOR  $\pi$ -pulse trains are on aromatic region for 600  $\mu\text{s}$ .  $S_0$  spectrum is in black (collected without REDOR  $\pi$ -pulse trains) and  $S$  spectrum is in red (collected with REDOR  $\pi$ -pulse trains). In (a) both the  $\pi$ -pulses in one rotor period are on the  $^{13}\text{C}$  channel, whereas in (b), one  $\pi$ -pulse is on  $^{13}\text{C}$  channel and the other is on  $^1\text{H}$  channel.



**Figure S2(a-f):** Example of Hahn echo  $^1\text{H}_\text{N}$  relaxation data fitted to an exponential decay for certain residues, Q2, T16, T25, D40, Y45 and E56, in GB1. For T25 (c) and Y45 (e) respectively, the data points beyond 13 and 18 ms have been excluded due to low signal-to-noise ratio.