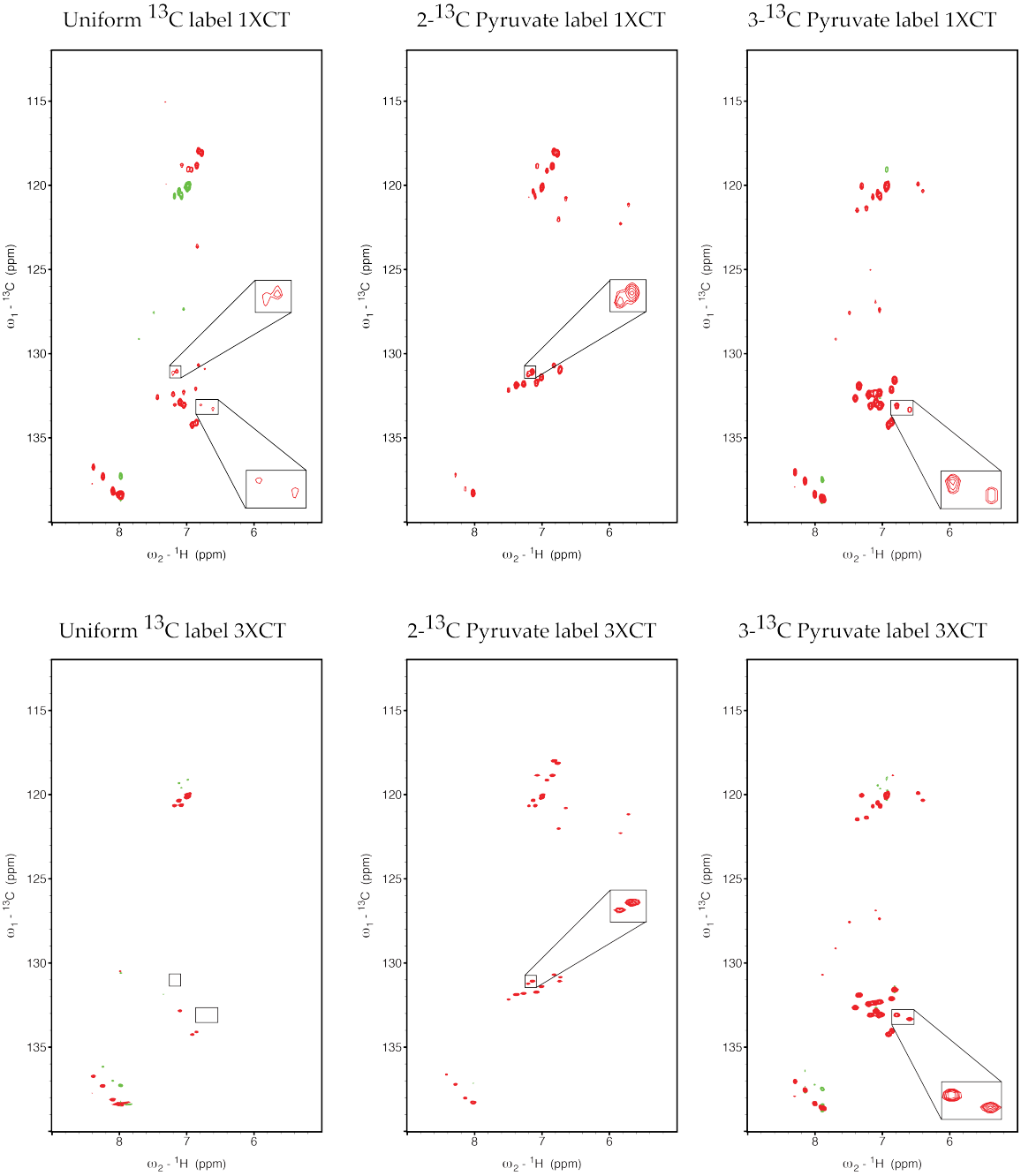
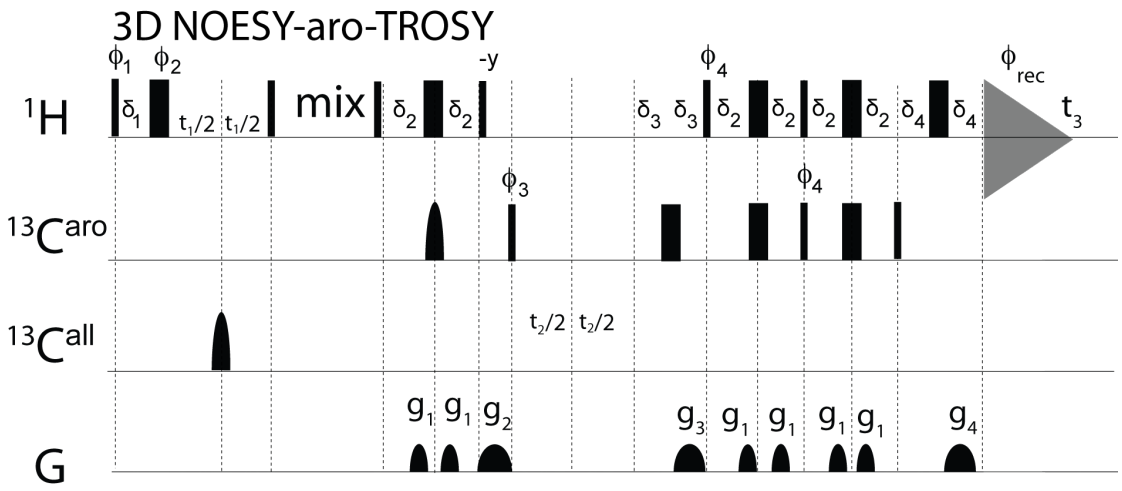
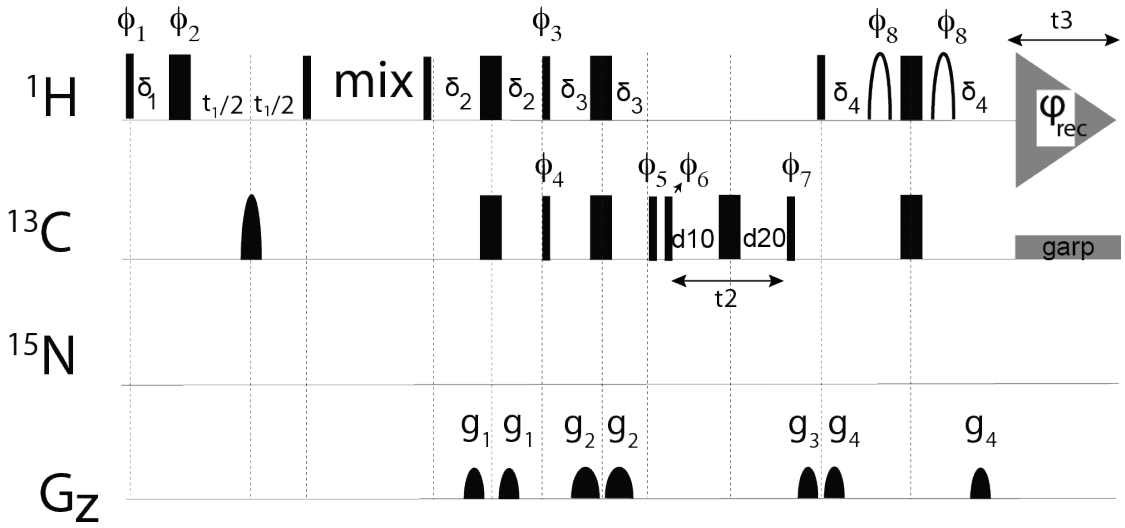
Supplemental Figures and pulse sequences



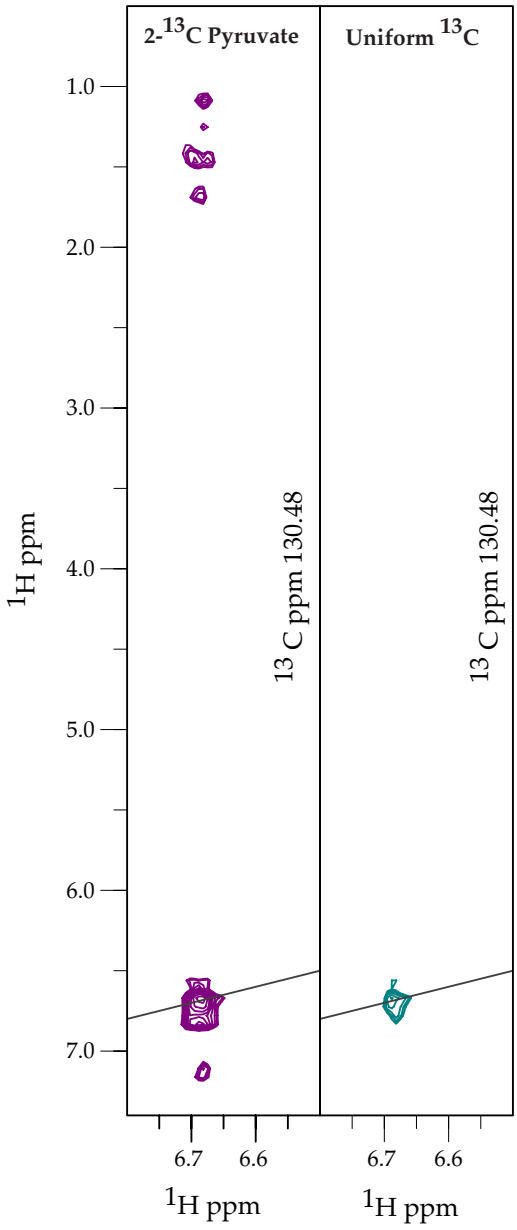
Supplementary Figure 1: Full aromatic TROSY spectra of the expansions shown in **Fig. 4** of the main text.



Supplementary Figure S2a: Pulse sequence of the 3D NOESY aromatic TROSY NMR experiment of **Fig. 6**. Narrow and wide bars indicate π/2 and π pulses, respectively, while semi-elliptical shapes on the carbon channel represent π broadband adiabatic inversion pulses with either 60 ppm or 20 ppm bandwidth (Crp60, Crp20) with 500 μs and 1 ms duration respectively. Pulses on ^{13}C were centered at 124.8 ppm, except during the t_1 period where the offset was shifted to 85 ppm. The time delays applied were $\boldsymbol{\delta_1}$ = 6 μs + 500 μs (Crp60), $\boldsymbol{\delta_2}$ = 1.5 ms, $\boldsymbol{\delta_{3,4}}$ = 1 ms and **mix** = 70 ms. A mixing time of 70 ms and a cycling delay of 1.0 s were used. Pulsed field gradients were applied along the z-axis with an intensity of $\mathbf{g_1}$ = 19 % for 300 μs, $\mathbf{g_2}$=47% for 1 ms, $\mathbf{g_3}$ = +/-80 % (Echo-Antiecho) for 1 ms, $\mathbf{g_4}$ = 20.1 % for 1 ms. The phase cycling was: $\boldsymbol{\phi_1}$ = 4(x),4(-x); $\boldsymbol{\phi_2}$ = 4(y), 4(-y); $\boldsymbol{\phi_3}$ = y,-y,-x,x; $\boldsymbol{\phi_4}$ = y and $\boldsymbol{\phi_{rec}}$ = y,-y,-x,x,-y,y,x,-x. All other rf pulse phases were set to x except when indicated otherwise. Quadrature detection in t_1 was achieved by the States-TPPI technique (Marion et al.) applied to phases $\boldsymbol{\phi_1}$ and $\boldsymbol{\phi_2}$. Quadrature detection in t_2 was achieved by Echo-Antiecho applied to phases $\boldsymbol{\phi_3}$ and $\boldsymbol{\phi_4}$. Note: the pulse scheme would have improved sensitivity with the TROSY read out scheme by Pervusin or Meissner/Sorensen as we discussed in **Fig. 5**.



Supplementary Figure S2b: Pulse sequence for the 3D NOESY-Aromatic TROSY corresponding to the spectra in **Fig.6.** The pulse sequence shown below is based on the one available from the standard Bruker pulse program library (noesytrosyargpphwg). Narrow and wide bars denote 90^0 and 180^0 pulse respectively. All pulses are applied on the x axis unless otherwise noted. Empty ellipsoids represent water selective 90^0 flip back pulses (Sinc) and the filled ellipsoid represents adiabatic refocusing pulse on the Carbon channel (WURST). All gradients in the pulse sequence are crusher gradients or refocusing gradients. On the gradient channel the filled ellipsoids are smoothed-square shaped pulse z-gradients: $\mathbf{g_1}$ (1 ms) = 5.89 G/cm, $\mathbf{g_2}$ (500 µs) = 9.63 G/cm, $\mathbf{g_3}$ (1ms) = 42.8 G/cm, $\mathbf{g_4}$ (500 µs) = 26.75 G/cm. The gradient pulse are followed by a 200 µs gradient recovery delay. The delays are as follows $\boldsymbol{\delta_1}$ = 6 µs + 500 µs (WURST), this delay ensures that the first point in the indirect proton dimension has a near zero evolution, $\boldsymbol{\delta_2} = 1/4J_{CH}$, $\boldsymbol{\delta_3} = 1/8J_{CH}$, $\boldsymbol{\delta_4} = (1/4J_{CH} - 1\text{ ms})$. Delays d10 and d20 = $(1/2J_{CC}\text{-}1/4J_{CH})$, this is part of the constant time encoding of the aromatic frequency. Delay mix is the NOESY mixing time. The phases are as follows, $\boldsymbol{\phi_1}$ = x x x x -x -x -x -x ; $\boldsymbol{\phi_2}$ = y ; $\boldsymbol{\phi_3}$ = -y ; $\boldsymbol{\phi_4}$ = π/4 5π/4 ; $\boldsymbol{\phi_5}$ = x y ; $\boldsymbol{\phi_6}$ = -x y; $\boldsymbol{\phi_7}$ = -y -y y y; $\boldsymbol{\phi_8}$ =-x -x ; $\boldsymbol{\phi_{rec}}$ = x x -x -x -x -x x x. This pulse sequence will be available for download from http://gwagner.med.harvard.edu/nmr.



Supplementary Figure S3: Two strips of the 3D NOESY-aromatic TROSY recorded with the Pervushin style TROSY are compared below for uniformly labeled and 2-^{13}C pyruvate labeled Bcl-xL.

References:

Marion, D.; Ikura, M.; Tschudin, R.; Bax, A. J. Magn. Reson. 1989, 39, 163-168.