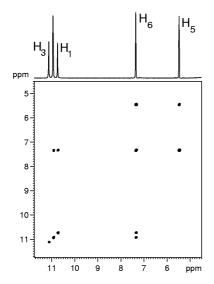
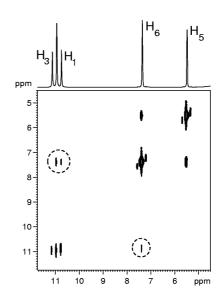


**Figure A1.** (a) 500 MHz  $^{1}$ H- $^{15}$ N HOESY spectrum of  $^{15}$ N-enriched uracil recorded in a mixture of DMSO- $d_6$ :H<sub>2</sub>O (5:1, vol.) at 300 K with a mixing time of 100 ms. The top and left 1D projections show the  $^{15}$ N and  $^{1}$ H spectra, respectively. (b) F2 trace along the water  $^{1}$ H chemical shift showing that the N<sub>3</sub>-water cross-peak is twice as intense as the N<sub>1</sub>-water cross-peak.



**Figure A2.** 500 MHz <sup>1</sup>H-<sup>1</sup>H COSY spectrum of <sup>15</sup>N-enriched uracil recorded in a mixture of DMSO-*d*<sub>6</sub>:H<sub>2</sub>O (5:1, vol.) at 300 K. The <sup>1</sup>H spectrum, shown as the 1D projection, can easily be assigned from the observed cross-peaks.



**Figure A3.** 500 MHz  $^{1}$ H- $^{1}$ H NOESY spectrum of  $^{15}$ N-enriched uracil recorded in a mixture of DMSO- $d_6$ :H<sub>2</sub>O (5:1, vol.) at 300 K with a mixing time of 500 ms. The  $^{1}$ H spectrum is shown as the 1D projection. The dashed circles evidence the NOE cross-peak between H<sub>6</sub> and H<sub>1</sub>, hereby confirming the spectral assignment.