



**Supplementary Figure 3.** FTIR spectra of Lti30, lipid vesicles or a mix of Lti30 and vesicles.

The figure shows the absorption spectra of the pH 5 experiment. Spectra are shifted vertically for a clearer presentation. The blue spectrum is for the protein vesicle mixture, the red spectrum for the protein sample, the green spectrum for the vesicle sample and the black spectrum is a buffer spectrum. The spectral range shown is between the strong absorption bands of the stretching and bending vibrations of D<sub>2</sub>O. The spectra are largely dominated by the absorption of HOD and D<sub>2</sub>O. Note that the buffer spectra is not subtracted from the other spectra before we calculated the second derivatives, shown in the other figures. Since the buffer spectrum contains only broad bands, its second derivative is featureless above 1600 cm<sup>-1</sup>.