Supplementary data for:

NMR study of the antifreeze activities of active and inactive isoforms
of a type III antifreeze protein

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Supplementary data Fig. S1: Morphological change in an ice crystal observed for 1 mM solutions of (A) wt nfcAFP8 and its mutants, (B) V20A, (C) V20G, (D) nfcAFP8_di, and (E) nfcAFP8_tri. Photomicroscope images were obtained at a cooling rate of 0.01 °C/min. (First column) $T_{m} + 0.1 \, ^{\circ}C$, (second column) $T_{m}$, (third column) $T_{m} > T > T_{burst}$, (forth column) $T_{burst} + 0.01 \, ^{\circ}C$, (fifth column) $T_{burst}$. 
Supplementary data Fig. S2: $^{1}\text{H}/^{15}\text{N}$-HSQC spectra of wt nfeAFP8 and its mutants, V20A, V20G, nfeAFP8_di, and nfeAFP8_tri in 90% H$_2$O/10% D$_2$O NMR buffer containing 10 mM sodium phosphate (pH 6.0) and 100 mM NaCl at 5°C.
Supplementary data Fig. S3: (A) Temperature dependence of the chemical shifts ($\Delta\delta/\Delta T$) of wt nfeAFP8 and its mutants, V20A, V20G, nfeAFP8_di, and nfeAFP8_tri as a function of residue number. Secondary structural elements for type III AFP are shown above the figure. (B) Expanded region of figure (A).
Supplementary data Fig. S4: The $^{1}H$-$^{15}N$ NOE data of the wt nfeAFP8 and its mutants, V20A, V20G, nfeAFP8_di and nfeAFP8_tri at 5°C.