Supporting Information

S1. Contact maps of MEQ peptide in solution

Contact maps show the probability of forming a contact between two residues of the protein at a given temperature. In the asymmetric contact maps below, we plot these probabilities for two different reduced temperatures, as is indicated below and above the diagonal. The temperature-induced changes in secondary structure and tertiary contacts for the peptide, Lys, and Fbr adsorbed and in solution are shown in Figures S1-S6.

Figure S1. Asymmetric contact maps of MEQ peptide during heating in solution.

Figure S2. Asymmetric contact maps of MEQ during adsorption and heating.
Figure S3. Asymmetric contact maps of Lys upon heating in solution. Melting begins at $T^*=2.4$ with nearly complete denaturation by $T^*=6.1$.

Figure S4. Asymmetric contact maps of adsorbed Lys during heating. The tertiary contacts begin to melt at $T^*=3.5$.

Figure S5. Asymmetric contact maps of Fbr during heating in solution. The beta elements undergo gradual melting in temperature range 2.0-6.1.
**Figure S6.** Asymmetric contact maps of Fbr during heating near the surface. Native elements are still observed up to $T^* = 3.5$. Melting begins at $T^* = 5.1$ with denaturation of most secondary elements by $T^* = 6.1$. 