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Random energy model for heteropolymer sequence design: the role of solvation LONGHUA HU, ALEXANDER GROSBERG, Department of Physics, University of Minnesota — We study the role of surface of the globule and the role of interactions with the solvent for the process of sequence design for heteropolymers. We follow the method developed in recent work (P.Geissler et al, Phys. Rev. E, **70**, 021802, 2004) in which solvation of random sequence heteropolymer was addressed using properly generalized random energy model (REM). By comparing the freezing transition in random and designed sequence heteropolymers, we discuss the effects of design. We discuss phase diagram of the system in the traditional variables of actual temperature versus design temperature. Based on our results we are able to show under which conditions solvation effects improve the quality of sequence design. Finally we discuss sequence space entropy and study how many sequences are available for design at a certain design condition.

Longhua Hu
Department of Physics, University of Minnesota

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