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Shi-Jie Chen* (chenshi@missouri.edu), Departments of Physics and Biochemistry, University of Missouri Informatics Institute, University of Missouri, Columbia, MO 65211. *RNA Folding: From Statistical Mechanics to Therapeutic Applications.*

The current experiments on structural determination cannot keep up the pace with the steadily emerging RNA sequences and new functions. This underscores the request for an accurate model for RNA three-dimensional (3D) structural prediction. Considerable progress has been made in mechanistic studies, but accurate prediction for RNA tertiary structural folding from sequence remains an unsolved problem. The first and most important requirement for predicting of RNA structure from physical principles is an accurate free energy landscape model. I will introduce a multiscale RNA folding theory recently developed in my lab. A key advantage of this new theory is the use of rigorous physical principles for chain entropies/free energies for RNA tertiary folds. I will present several biomedical applications of the theory including microRNA-gene target interactions and RNA-related therapeutic design (Received January 11, 2016)