1024-05-250 **Christine E Heitsch*** (`heitsch@math.gatech.edu`), School of Mathematics, Georgia Institute of Technology, Atlanta, GA 30332-0160. *Combinatorics of RNA Secondary Structures.*

Under a suitable abstraction, complex biological problems can reveal surprising mathematical structure. For instance, the planar self-bonding, or nested "secondary structure," of an RNA molecule is nicely represented by a plane tree. Under our plane tree model of RNA folding, we prove combinatorial theorems which yield insight into the coding of structural and functional information in RNA sequences. One result demonstrates the importance of local constraints in specifying a global structure while another characterizes the degree of branching in minimal energy configurations. Additionally, by transitioning between RNA configurations by an appropriate local move, we obtain an isomorphism with the lattice of noncrossing partitions. Thus, the interaction between combinatorics and molecular biology motivates new combinatorial theorems as well as advancing biological applications. (Received January 09, 2007)