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a new grammar for PK-structures

RNAFeatures is a novel grammar, capable of generating any RNA structure, including pseudoknots (PK). PK-structures seen as fat-graphs, lead to a filtration by their genus, with RNA secondary-structures corresponding to PK-structures of genus zero. RNAFeatures acts on formal, arc-labeled RNA secondary-structures, called lambda-structures. These correspond one-to-one to PK-structures together with decorations that consist of backbone permutations, for which the PK-structure is crossing-free. RNAFeatures employs an enhancement labeling of symbols and production rules. RNAFeatures is used to obtain a stochastic context-free grammar for PK-structures, using RNA sequences and structures. The induced grammar facilitates fast Boltzmann sampling and statistical analysis.