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*Recurrent patterns in the ribosome*

I will introduce the structural graph we have been using for a representation of ribonucleic acid (RNA) structure since the late 80's. Then, I will formally introduce RNA motifs, that is functional or structural significant patterns, and present three approaches to discover them. The first one, from biologists, is subjective and uses visual examination of RNA structures. The second uses a greedy and incremental algorithm that is costly and uses a subjective definition of significance. Finally, the third one was discovered from taking a natural step in the graph representation, that is by dividing the structural graph in a minimal cycle basis. We found redundant cycles that correspond directly to and others that compose acknowledged structural and functional motifs. The new approach has also allowed us to discover new instances of the classical GNRA motif that do not fit the GNRA sequence definition. We are now building a theory of RNA cycles that we see as an expression of fundamental thermodynamics rules at a higher than the atomic level.