Constraint Programming in Computational Biology

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Constraint programming is a new programming language paradigm that appeared in the late 80's and became more and more popular during the 90's. In a constraint program, the user specifies a number of constraints. Each constraint expresses some partial information on the state of the system under investigation. The constraint programming engine provides algorithms that allow one to infer new constraints implied by the given ones, and to compute solutions, i.e., values for the variables satisfying all the constraints. We describe two types of applications of constraint programming to computational biology: determining the structure of biological macromolecules, and modeling the functioning of biological systems on the molecular and cellular level.