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Quasispecies theory for multiple-peak fitness landscapes ENRIQUE MUNOZ, Department of Bioengineering and Department of Physics and Astronomy, Rice University, DAVID SAAKIAN, Yerevan Physics Institute, Yerevan, Armenia, CHIN-KUN HU, Institute of Physics, Academia Sinica, Taiwan, MICHAEL DEEM, Department of Bioengineering and Department of Physics and Astronomy, Rice University — We used a path integral representation to solve the Eigen and Crow-Kimura molecular evolution models for the case of multiple fitness peaks with arbitrary fitness and degradation functions. In the general case, we find that the solution to these molecular evolution models can be written as the optimum of a fitness function, with constraints enforced by Lagrange multipliers and with a term accounting for the entropy of the spreading population in sequence space. The results for the Eigen model are applied to consider virus or cancer proliferation under the control of drugs or the immune system.

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