Point Mutations Effects on Charge Transport Properties of
the Tumor-Suppressor Gene p53

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CEA/DSM/DRFMC/SPSMS Grenoble, France — We report on a theoretical study
of point mutations effects on charge transfer properties in the DNA sequence of the
tumor-suppressor p53 gene. On the basis of effective tight-binding models which
simulate hole propagation along the DNA, a statistical analysis of mutation-induced
charge transfer modifications is performed. In contrast to non-cancerous mutations,
mutation hotspots tend to result in significantly weaker changes of transmission
properties. This suggests that charge transport could play a significant role for
DNA-repairing deficiency yielding carcinogenesis.

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