**Whack-A-Mole Model: Towards a Unified Description of Biological Effects Caused by Radiation Exposure**

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We present a novel model to for estimating biological effects caused by artificial radiation exposure, i.e., the Whack-A-Mole (WAM) model. It is important to take into account the recovery effects during the time course of cellular reactions. The inclusion of dose-rate dependence is essential in the risk estimation of low-dose radiation, while nearly all the existing theoretical models rely on the total dose dependence only. By analyzing experimental data of the relationship between the radiation dose and the induced mutation frequency of five organisms, namely, mouse, *Drosophila*, chrysanthemum, maize, *Tradescantia*, we found that all the data can be reproduced by the WAM model. Most remarkably, a scaling function, which is derived from the WAM model, consistently accounts for the observed mutation frequencies of the five organisms. This is the first rationale to account for the dose rate dependence as well as to provide a unified understanding of a general feature of organisms.

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