



Supplementary Materials for Cellular survival over genomic perfection

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This PDF file includes:

Captions for Movies S1 and S2

Other Supplementary Materials for this manuscript include the following:
(available at science.sciencemag.org/content/366/6467/802/suppl/DC1)

Movies S1 and S2

Movie Captions

Movie S1. Modeling the costs of DNA repair.

S1 shows a mathematical model [derived and reinterpreted from Breivik and Gaudernack (13)] that explores relationships between DNA damage and the costs associated with limited or unlimited DNA repair. In this model, most DNA damage is not associated with a deleterious effect. DNA-repair-limited cells (cyan) are more likely to survive, whereas the costs of unlimited DNA repair (blue) result in potential apoptosis (black dots). DDR, DNA repair. Model parameters (top left corner): pdeath, probability of apoptosis; DamageRate, rate of DNA damage; repairtime, time spent in repair.

Movie S2. The costs of DNA repair when DNA damage is highly deleterious.

S2 shows an alternative (even if unlikely) model that if DNA damaging events are highly deleterious (for example, if most mutations affected protein function), DNA-repair-limited cells are unlikely to survive. DNA-repair-unlimited cells may avoid apoptosis, although cell division rate would be reduced, owing to repair and checkpoint activation, potentially inducing senescence (arrested cell division).