

HORMESIS

1. Empirical evidence of reduced gradient in effect as dose increases for various end points is assumed to be due to induction of repair efficiency.
2. Much of the evidence excluded accurate zero dose points and may thus merely be an artefact of the biphasic 2-population sensitivity issue.
3. This also focuses attention on the cell DNA repair systems and suggests that they have a range of induced variability in efficiency and may be boosted by increasing stress up to the point where the repair systems are overwhelmed as in e.g. haemoglobin oxygen dissociation curve, suntanning and other phenomena.
4. We distinguish between repair efficiency induction
 - (a) during the experiment continuously and
 - (b) between experiments i.e. small priming dose followed by large study effects dose and
 - (c) natural selection effects in cell populations (radiotherapy etc.) and human populations living in high background/radon areas (selection of radioresistance due to death at or before reproduction of sensitive individuals).
 - (d) cell killing effects as the dose increases

CONCLUSION

1. Increased repair is associated with increased replication rate and therefore premature ageing of the cell and individual: no such thing as a free lunch. Why do we not have high efficiency repair systems normally? Because there is a downside.
2. Focus on the repair system begs the question of how repair systems may be attacked or bypassed e.g. Second Event, fractionating doses.
3. Increasing the radioresistance by natural selection, observed in high background regions, has ethical implications if applied to nuclear pollution.