

## Elephants and Cancer: A Study of Epic Proportions

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As reported in *The New York Times* ([Science: October 8, 2015](#)), two teams of scientists examined the cells of elephants, as examples of very large, long-lived animals, to learn if they had developed special anti-cancer strategies. It turns out that while 11% to 25% of humans die from cancer, only 5% of elephants do. A key finding is that while humans have two copies of the p53 gene, elephants have many. In humans, the product of the p53 gene monitors the cell for damage. Sensing damage, it may induce repair, cessation of division, or trigger apoptosis. The critical importance of p53 for prevention of cancer can be inferred from individuals with a defective copy the p53 gene. These individuals have a 90% chance of developing cancer. In elephants, it seems that in damaged cells, the product of p53 induces cellular death. It is not yet known how or why this happens. The strategy of multiple copies of p53 seems unique to elephants.

While it is very premature to expect that therapeutic interventions will be developed to induce greater expression of p53 as an anti-cancer strategy in humans, it does seem reasonable to explore the cellular

strategies of other very long-lived animals (such as tortoises, parrots, and whales) to better understand the cellular strategies that they have evolved to reduce the risk of cancer.

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