

2013 Letter to the White House Office of Science and Technology



COLUMBIA UNIVERSITY
College of Physicians
and Surgeons

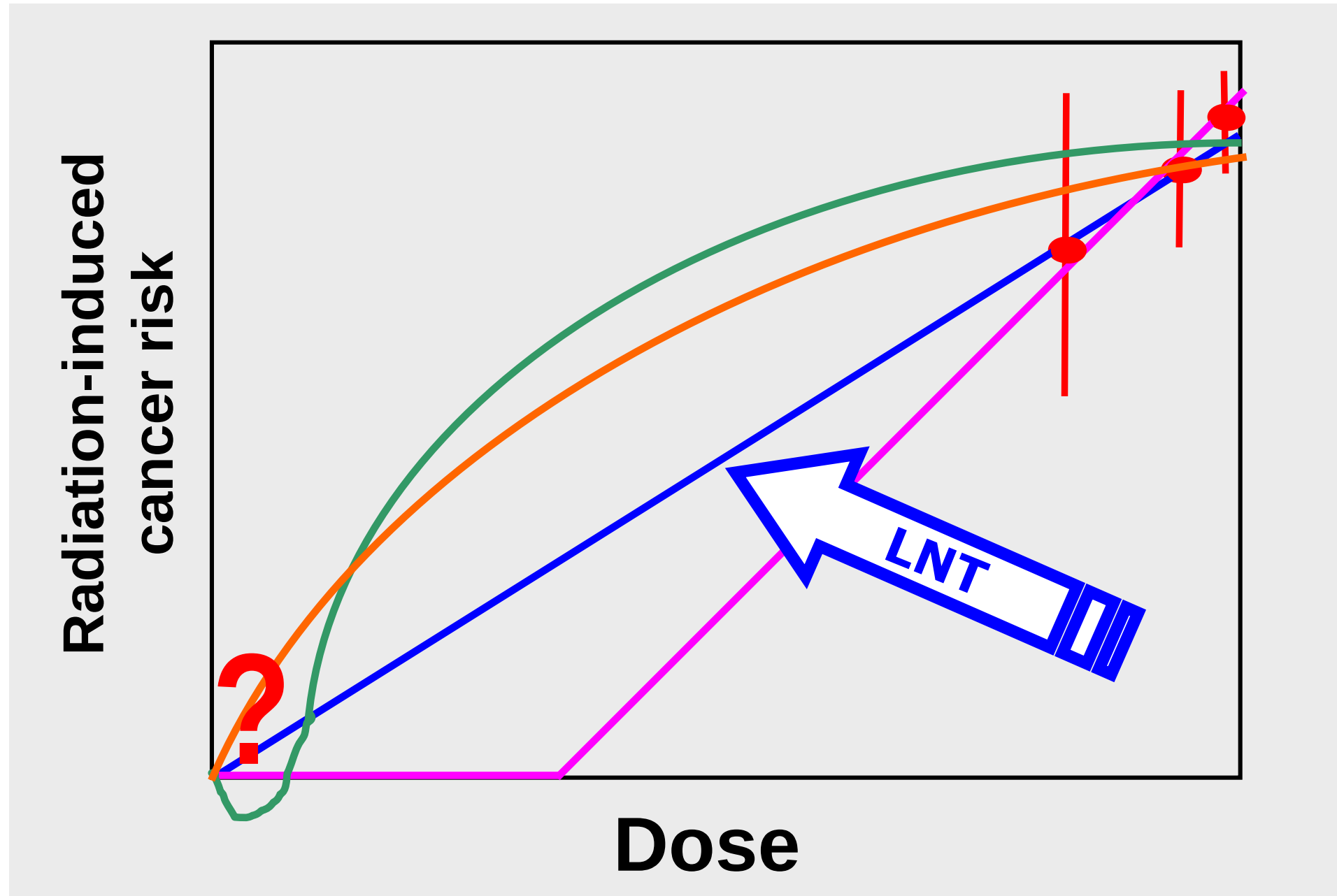
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- 1. We have major gaps in our understanding of the health effects of low doses of radiation***
- 2. We are rapidly losing subject matter expertise***
- 3. Economics: >\$100 billion Hanford cleanup costs***

Where are the biggest gaps?

1. Extrapolating risks to doses below where epidemiology can help



The biophysical argument that leads to LNT makes a number of assumptions that should be questioned:

❖ Repair mechanisms are small, is the

❖ Immunosurveillance is there still cells?

❖ The biophysical argument assumes that the development of tumors arises from damaged cells, independent of surrounding damage

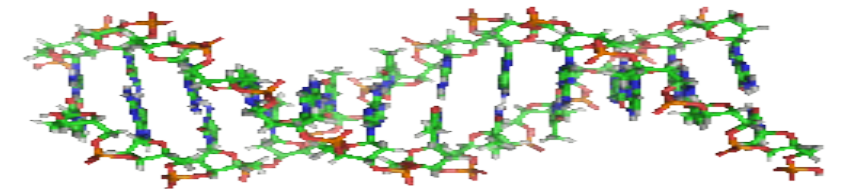
At this time we don't know if potential deviations from the predictions of LNT will be large or small....

.... or even whether they will decrease or increase low-dose cancer risk estimates

Where are the biggest gaps?

2. Who gets radiation-induced cancer?

- **Irradiated populations typically show small increase in cancer risks**
 - **Are these radiation-induced cancers random events ... the roll of the dice?**
 - **Or are they largely confined to genetically radiosensitive sub-groups?**



This author's view of the three most promising approaches:

- 1. Testing / quantifying the assumptions underlying the LNT arguments**
- 2. Understanding variations in radiation sensitivity**
- 3. Looking for unique “fingerprints” of radiation-induced cancer in tumors**