

Passage I

Scientists studied the effects of Drug A on cancer Cell Lines V–Z. Table 1 shows the organ of origin and the LD_{50} (the concentration necessary to kill 50% of cells) of Drug A for each cell line.

Cell Line	Organ of origin	LD_{50} of Drug A ($\mu\text{g}^*/\text{L}$)
V	bladder	2.2
W	colon	6.9
X	colon	3.8
Y	prostate	70.0
Z	prostate	818.0

* $\mu\text{g} = 10^{-6}$ gram

Six petri dishes were prepared, each with 1,000 cells from Cell Line V. Drug A was added to 5 of the dishes in different concentrations, and all 6 dishes were incubated for 72 hr. Then the drug was removed, and the surviving cells were incubated for 10 days. This procedure was repeated for Cell Lines W–Z. Figure 1 shows the *percent colony formation* (percent of the surviving cells that divided to form colonies) for each cell line at each concentration of Drug A.

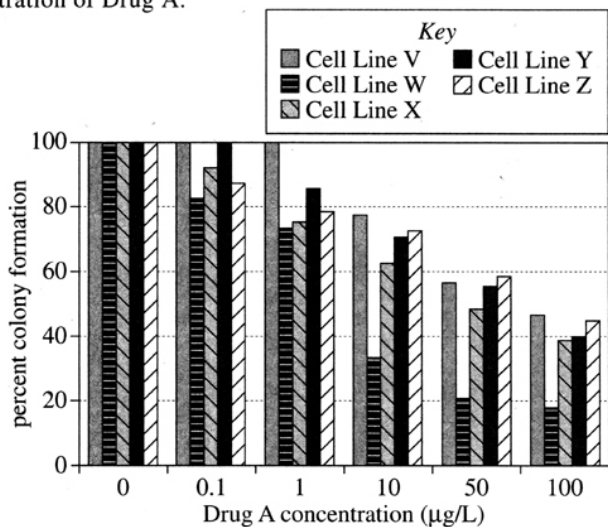


Figure 1

Table 1 and Figure 1 adapted from Debra Ferguson et al., "Anti-tumor Activity of Orally Bioavailable Farnesyltransferase Inhibitor, ABT-100, Is Mediated by Antiproliferative, Proapoptotic, and Antiangiogenic Effects in Xenograft Models." ©2005 by American Association for Cancer Research.

- According to Figure 1, as the concentration of Drug A increased, the percent colony formation for Cell Line Z:
 - increased only.
 - decreased only.
 - increased, then remained the same.
 - decreased, then remained the same.
- Based on Table 1, Cell Line W was formed from tissue found in which system of the human body?
 - Circulatory system
 - Digestive system
 - Reproductive system
 - Respiratory system
- Based on Figure 1, if cells from Cell Line X had been treated with Drug A at a concentration of 200 $\mu\text{g}/\text{L}$, the percent colony formation would most likely have been:
 - less than 40%.
 - between 40% and 50%.
 - between 50% and 60%.
 - greater than 60%.
- According to Table 1, the concentration of Drug A necessary to kill 50% of the cells from Cell Line Y was approximately 10 times the concentration of Drug A necessary to kill 50% of the cells from:
 - Cell Line V.
 - Cell Line W.
 - Cell Line X.
 - Cell Line Z.
- At which of the following concentrations was Drug A completely ineffective in preventing the surviving Cell Line V cells from dividing to form colonies?
 - 1 $\mu\text{g}/\text{L}$
 - 10 $\mu\text{g}/\text{L}$
 - 50 $\mu\text{g}/\text{L}$
 - 100 $\mu\text{g}/\text{L}$