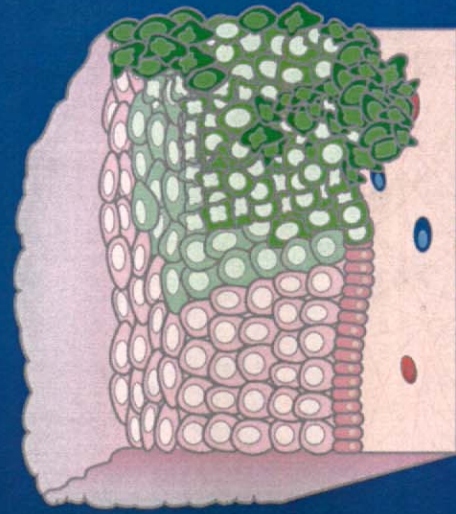


Understanding Cancer and Related Topics

Understanding Cancer



Artwork by Jeanne Kelly. © 2004.

Developed by:

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Donna Kerrigan, M.S.

Jeanne Kelly

Brian Hollen

Discusses and illustrates what cancer is, explains the link between genes and cancer, and discusses what is known about the causes, detection, and diagnosis of the disease.

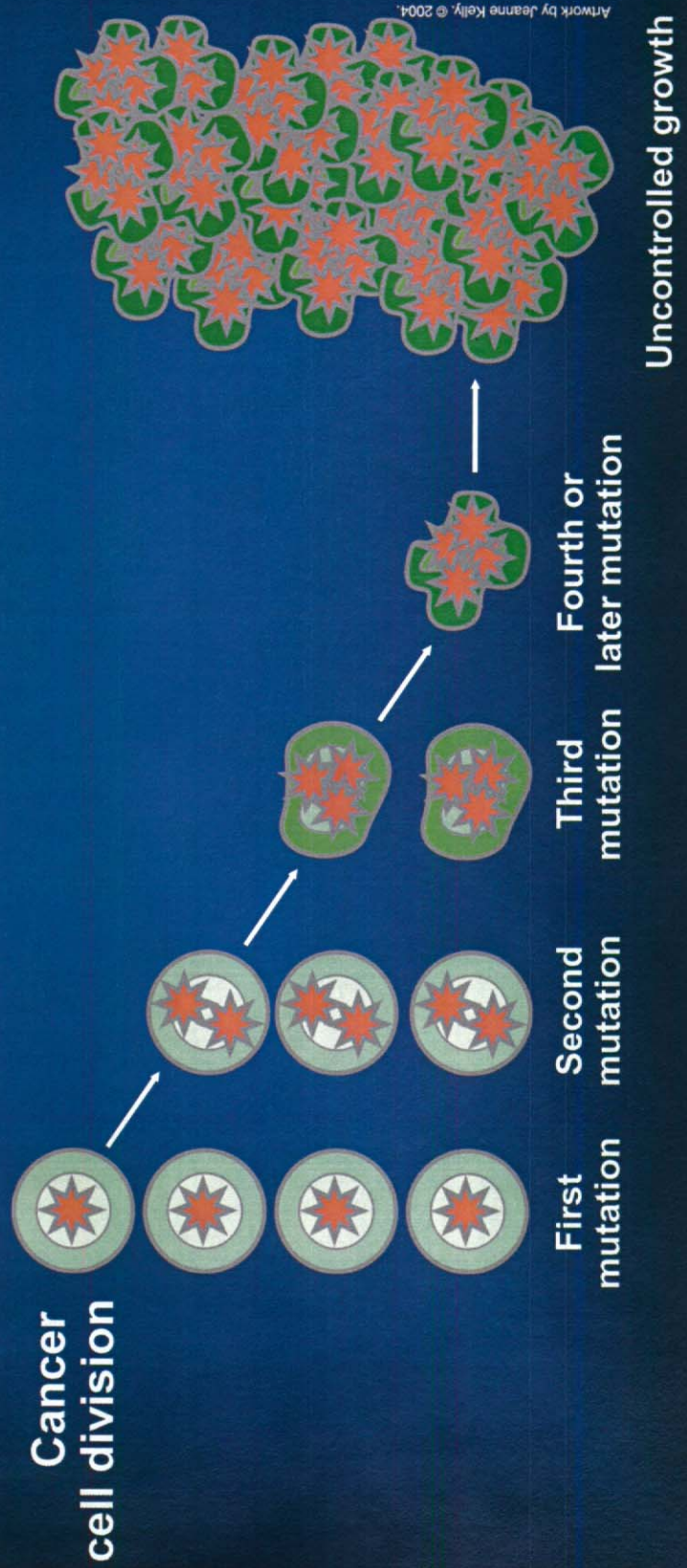
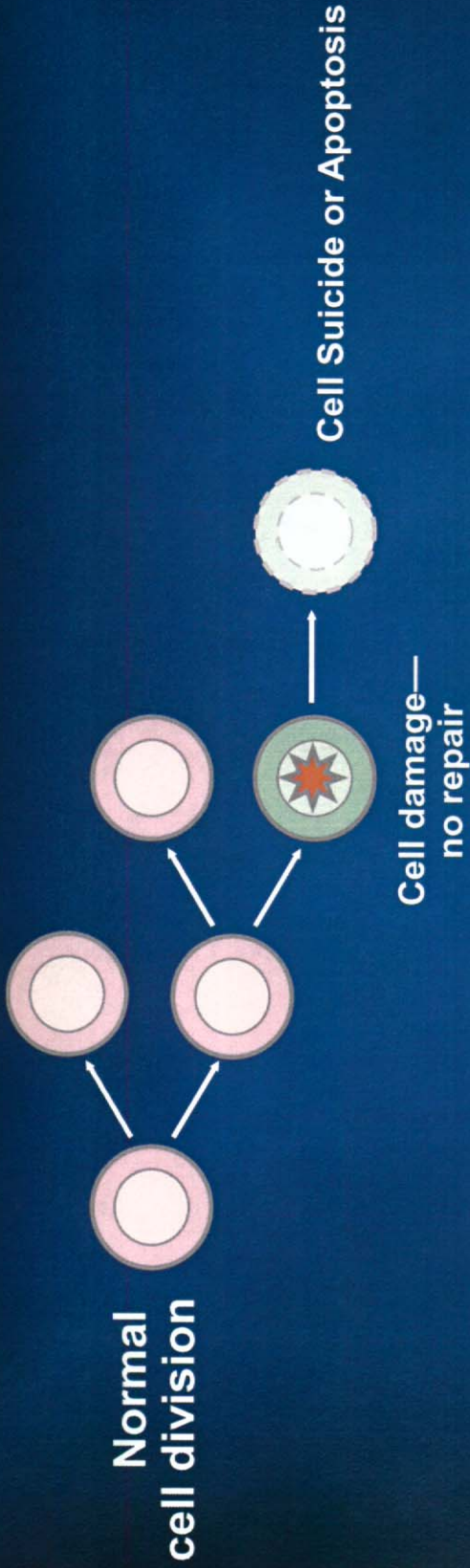
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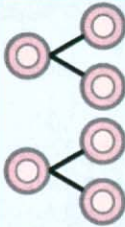









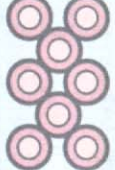

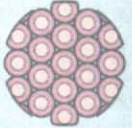

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Loss of Normal Growth Control



Artwork by Jeanne Kelly, © 2004.

Microscopic Appearance of Cancer Cells

Normal	Cancer
	
	
	
	
	
	
	

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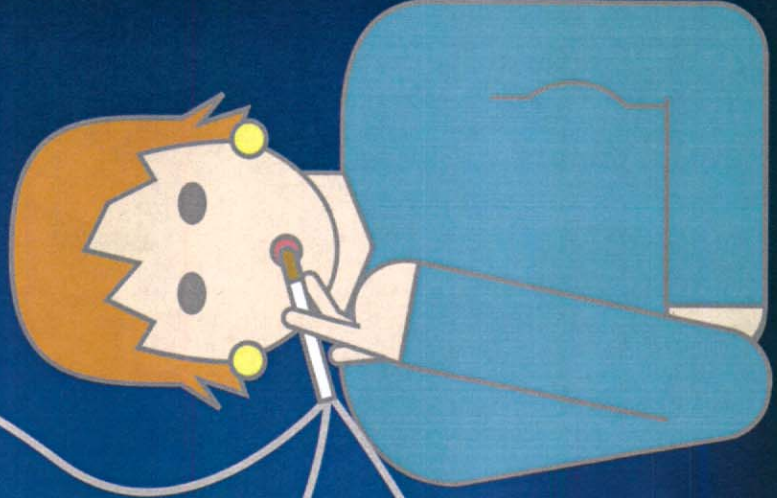
Tobacco Use and Cancer

Some Cancer-Causing Chemicals in Tobacco Smoke

aminostilbene
arsenic
benz[a]anthracene
benz[a]pyrene
benzene
benzo[b]fluoranthene
benzo[c]phenanthrene
benzo[f]fluoranthene
cadmium
chrysene
dibenz[a]anthracene
dibenzo[a]fluoranthene
dibenz[a]acridine
dibenz[a]acridine
dibenzo[c]g]carbazone
N-dibutyl nitrosamine
2,3-dimethylchrysene

indeno[1,2,3-c d]pyrene
S-methylchrysene
S-methylfluoranthene
alpha-naphthylamine
nickel compounds
N-nitrosodimethylamine

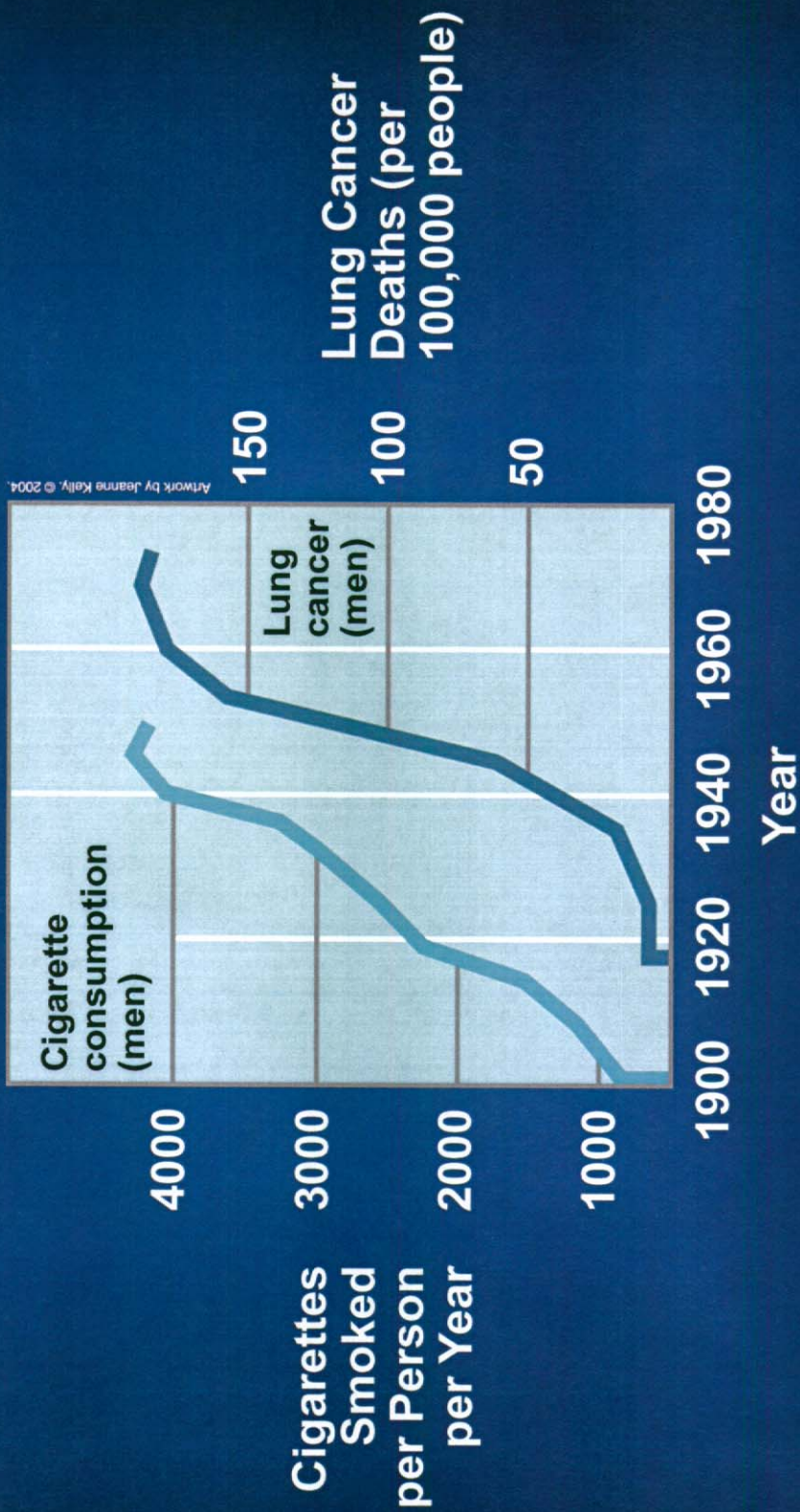
N-nitrosomethylethylamine
N-nitrosodiethylamine
N-nitrosornicotine
N-nitrosoanabasine
N-nitrosopiperidine
polonium-210



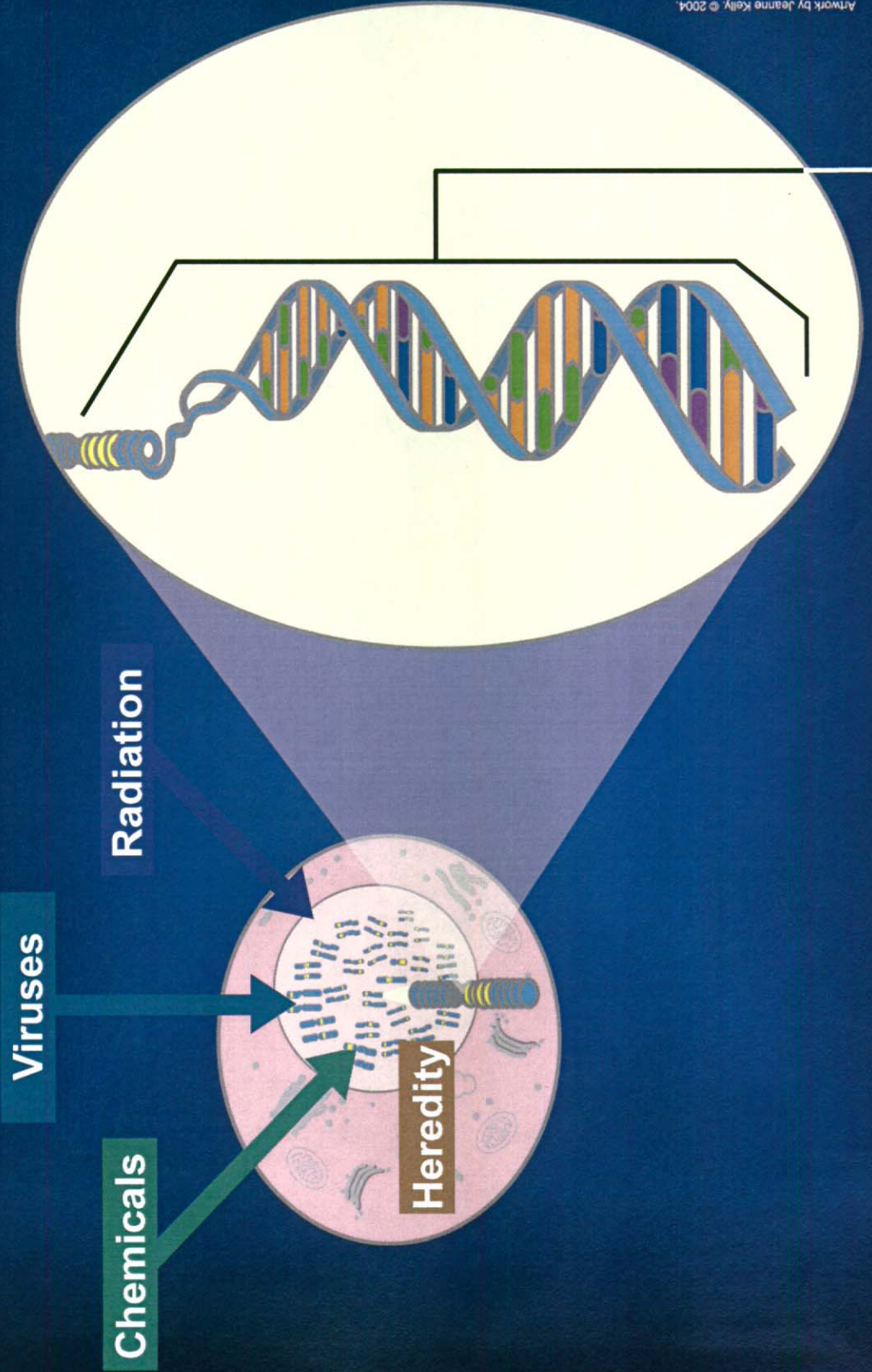
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Lag Time

20-Year Lag Time Between Smoking and Lung Cancer



Genes and Cancer



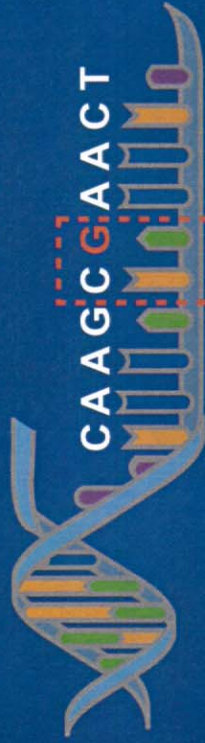
Artwork by Jeanne Kelly © 2004.

Chromosomes
are DNA
molecules

DNA Mutation



Normal gene



Single base change



Additions



Deletions

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Oncogenes



Normal genes regulate cell growth

Normal cell



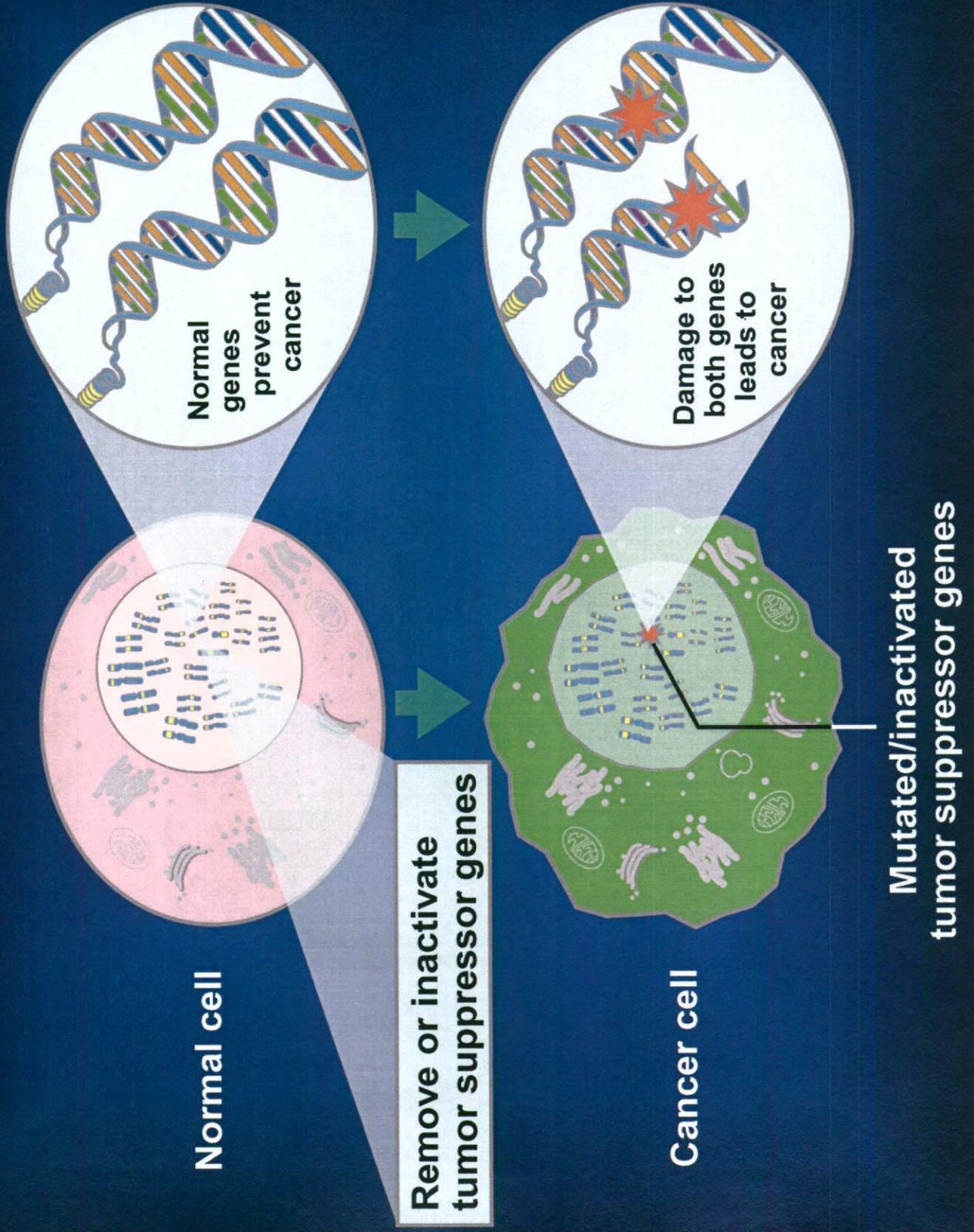
Oncogenes accelerate cell growth and division

Cancer cell

Mutated/damaged oncogene

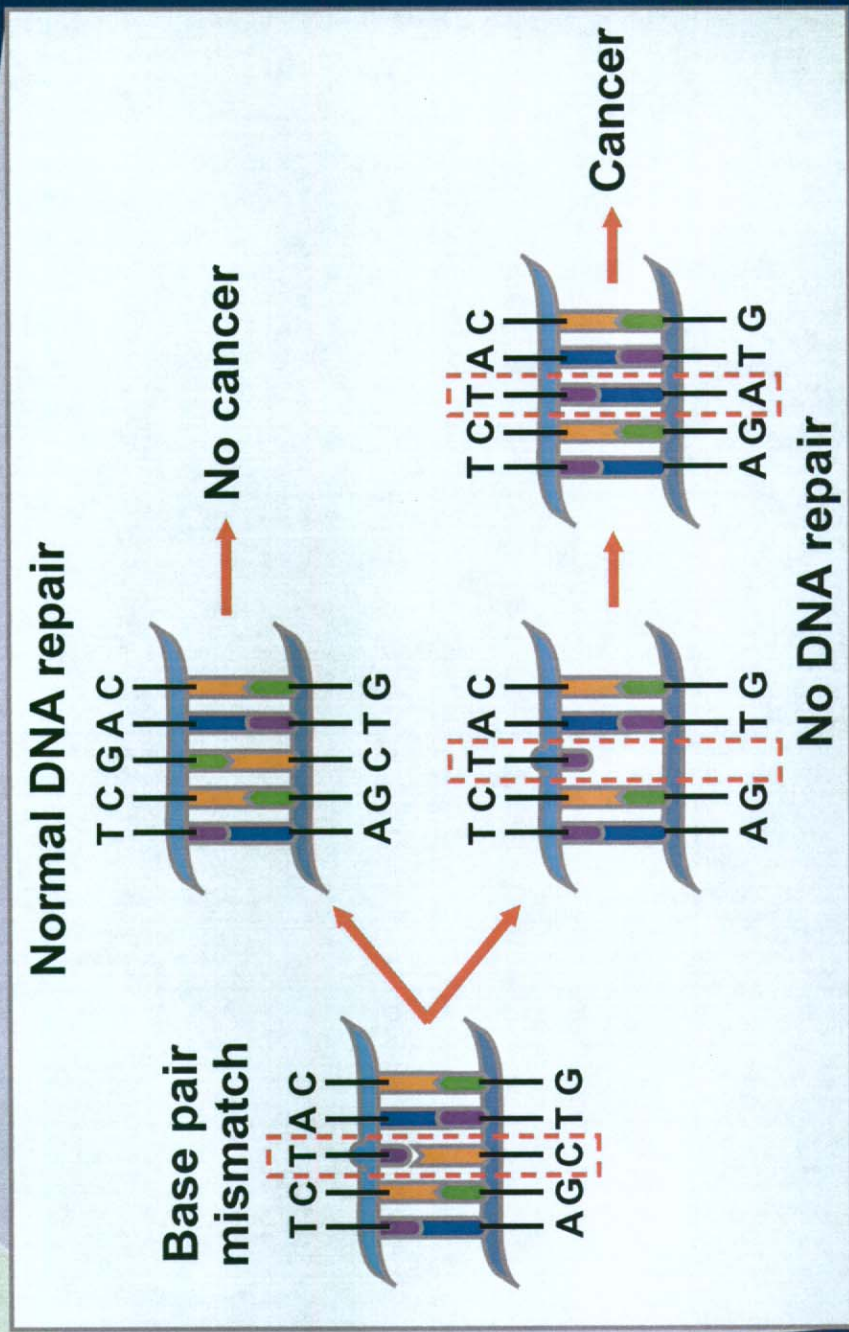
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Tumor Suppressor Genes



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DNA Repair Genes

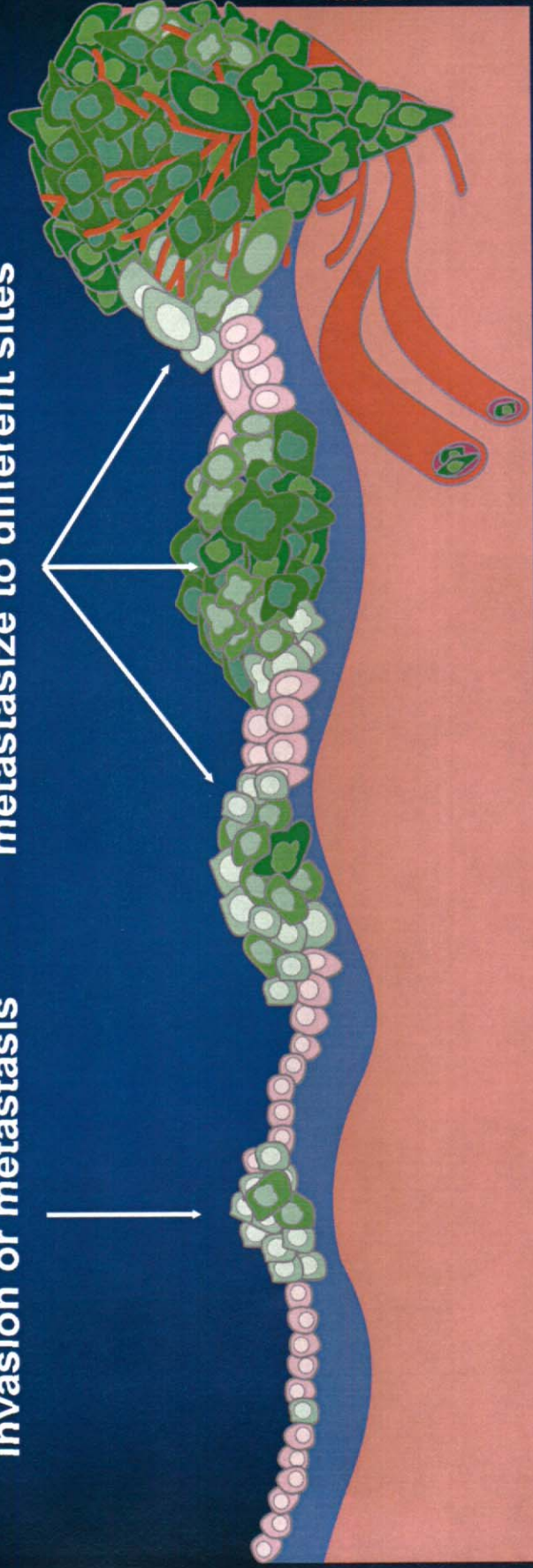


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Cancer Tends to Involve Multiple Mutations

Benign tumor cells grow only locally and cannot spread by invasion or metastasis

Malignant cells invade neighboring tissues, enter blood vessels, and metastasize to different sites



Artwork by Jeanne Kelly © 2004.

Time

Mutation
inactivates
suppressor
gene

Cells
proliferate

Mutations
inactivate
DNA repair
genes

Proto-oncogenes
mutate to
oncogenes

More mutations,
more genetic
instability,
metastatic
disease