Cancer genetics
- all cancer is genetic; mutations in somatic cells cause clones of those cells to acquire malignant properties, including loss of growth control and metastatic capacity
- cancer can be familial, indicating inherited mutations that can lead to high likelihood of cancer occurring

Environmental and other etiological factors
- largest contributions by tobacco and genetic susceptibility

Cells of a tumor seem to derive from a single cell
Tumors are clonal expansions

Multi-step carcinogenesis:

Types of genes which predispose to cancer when mutated in the germline
- tumor suppressor genes (most often)
- mutator genes (less often)
- activated oncogenes (rare; examples in familial cancer)

Oncogenes
- first identified since they could be pulled out of cancer cells, transformed into normal cells, and cause cancer
- normal form: proto-oncogene
- growth-promoting factors

Tumor suppressor genes
- normal activity: controls cell growth
- one hit doesn’t cause a problem; after 2 hits, with both copies gone or mutated, the brakes on cell growth are removed