**Tumorbiology**

Mutations in protonocogenes and tumersipressor genes occur, tumor grows ncrotollably and does angiogenesis, breaks through basal lamina, invasion and metastasis

Replicative senescence: cels dies after a vertain number of replications. In cancercells we ave telomerase that recovers telomere ends, so they are protected from cell death

Tumors need blood vessels in their environment so they get oxygen and nutrients. Low oxygen – hif1-lpha – vegf – angiogenesis. Mostly immature blood vessels and not nicely ordered

Proteases used to kill basal lamina – go into tissue – go into blood vessels and travel – break through blood vessels to invade a new tissue – compete with environemtn: metastasis

Stem cells for cancer cells: either tuations in stem cells or in transitory amplifiying cells that dedifferentiate.

Endostatin, angiostatin, vegf inhibitors, thalidomide

Herceptin binds to her2 so egf cannot bind there anymore

Melanomes: b-raf inhibitors, anergy for kinase activity

Gleecev inhibitrs the acitvgtiy of the fusion protein from the hcromosamal translocation Bcr-abl: less proliferation

**Tissues**

Paneth cells: immune system of dünndarm, secrete ntibacterial b^proteins

Goblet cells: secreting cells

Absorpitvf cells: secerete digestion enzymes and got dense microvilli for absorption

Enteroendocrine cells: secrete hormones and reugualting molecules redgarding proliferation and digestion

Another way of tracking cells: ubiquitous reporter – loxP – stop signal – loxP – lacZ. Another chromosomes: Cre under tissue specific promoter: removes stop signal basically and lacZ is expressed in all of these cells.

**Developmental bio**

Cambric explosion: increase in complexity of baupläne and types of cells, 40 to 50, leading multicellular organisms tissues etc. happened ca 550m yrs ago.

Conversion of pathways, conversion of proteinsy and genes, common developmental scheme: gastrulation

Cleavage, morula, blastula, gastrula, embryo, organogenesis fetus baby adolescent organism adult

Cells become a specialized cell type some time later. Happens through morophogens and lateral inhibitopns through signalling of decisive factors

Midblastula transicoitn: transcitipion of zygotic genes.

Blastocoel and blastomere

Synzitium: in drosophila during embryogenesis: in earlyy phase, cytoplasm has lots of nuclei so morphogens are TF.

Bicoid, nanos, toll, torso

Bicoid: anterior, nanos: posterior, torso: terminal, toll: dorsoventral

Maternal mrna bicoid at posterior pole: in syncytium there is a bicoid gradient defning the anterior posterior axis.

In xenopus, animal pole: epithelial struc, vegetative pole: internal stru