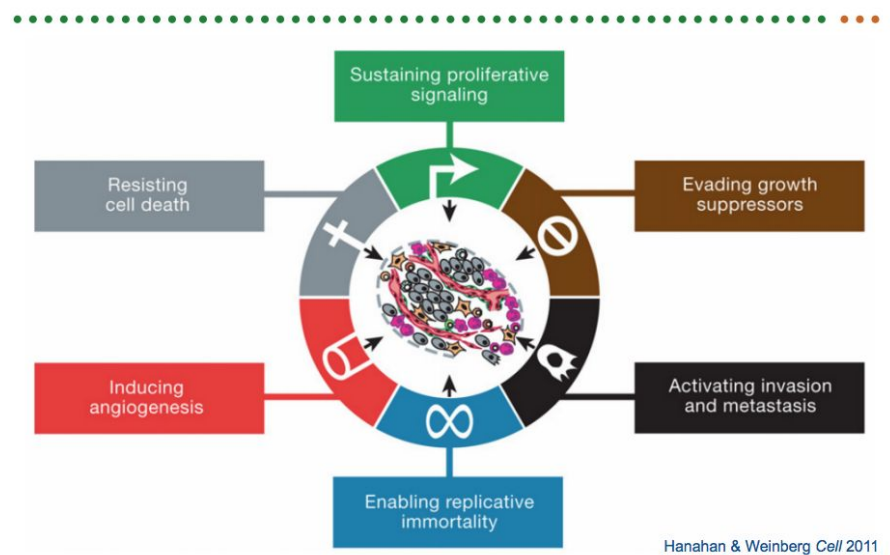


Cycle 9: Class 19 Cancer

1. most common cancers in Canada
 - Breast
 - Colon cancer
 - Lung cancer
2. how to take precautions against preventable cancer
 -
3. reasons why identical twins may have different cancer incidence
 -
4. reasons why cancer mortality varies across geographical areas in Canada
 - Available resources for treatment
 - Different mutagens in different places
5. how DNA methylation can regulate gene expression
 - Fragments produced because of methylation is similar (in babies) , but as adult, the methylation is different
 - Methylation is epigenetic -
6. basic characteristics or "hallmarks" of cancer cells

Hallmarks of Cancer



7. relative heritability of cancer in humans
 - Heritability- the proportion of phenotypic variability can we attribute to genotypic variability
 - There are differences in genotype, cancers heritability is low, (0.27-0.42)
 - For all the knowledge we have about the genetics of cancer, we don't know much about the heritability, there is more than genetics going on

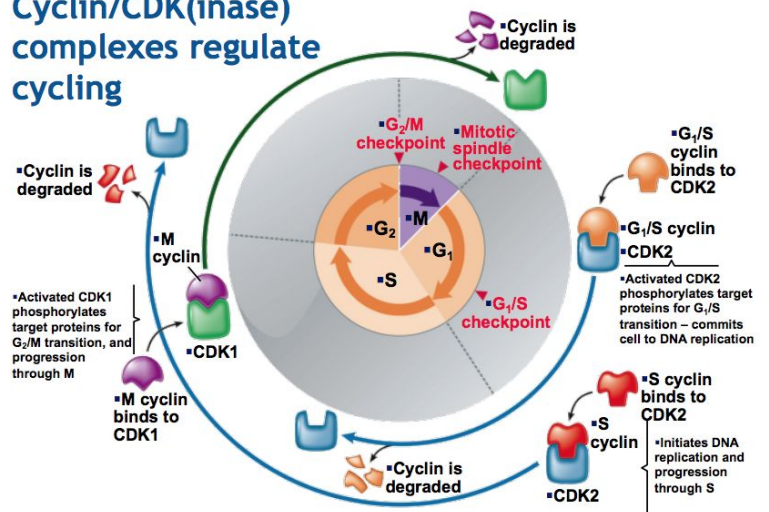
8. role of proto-oncogenes, tumor suppressor genes and oncomirs in normal organismal metabolism/development

9. mechanisms by which a virus could cause cancer without causing mutation

10. general role of cyclin/CDK complexes in regulation of cell cycle checkpoints (not the specific Cdk/cycling combinations)

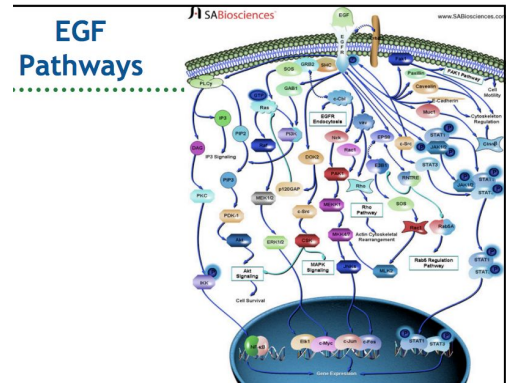
- We all go through the phase of rapid cell division as embryo, that then need to stop!
- Our genome has genes that cause out genes to grow and to stop
 - Controlled at the checkpoints

Cyclin/CDK(inase) complexes regulate cycling



11. role of proto-oncogenes, tumor suppressor genes and miRNA genes in cancer

- We made an enemy, genes that cause cancer- BUT NO, no genes are coded to cause cancer
- These cells are used to help heal cuts and stimulates transcription (EGFR gene)
 - But if this gene suffers a mutation or has increased effect, it has the potential to develop a tumor
- miRNA are NOT cancer causing genes, but inappropriate expression can promote cycling (Ex. Oncomers)



12. EGF pathways

- It is a very complex pathway involving multiple genes,

13. role of TP53 gene

- Genes that evolved to slow down division at the end of embryosis
 - It can result in increased DNA repair, cell cycle arrest by blocking cyclin and apoptosis
 - If cells get through these checkpoints it can lead to....

14. mechanisms for conversion of proto-oncogene to oncogene

15. explanation for why increased cancer risk can be inherited

- Families are inheriting a defective repressor gene (BRCA1)...

- During the development of the body can develop another mutated gene and thus has a higher risk of cancer
16. explanation for why cancer incidence tends to increase with age

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