0. Immunity, Apoptosis Pathways & Autophagy (on YouTube)

The following YouTube presentations (below) will help you understand innate and adaptive immunity (section 0). Aloe and Chaga mushrooms stimulate both innate and adaptive immunity. We provide a schematic of apoptosis pathways on page 2. Each pathway is presented on YouTube in sections 1-11. Section 20 (Autophagy) is explained with YouTube presentations. These pathways were put in our cells so that what we eat and when we eat can keep us healthy. **The average healthy person removes 60 billion aberrant cells (i.e. defective cells or cancer cells) daily using apoptosis pathways. If cancer cells are removed when they are first formed, you never get cancer.** Scientists around the world are trying to develop drugs that activate these food pathways. Remember "foods modulate the pathways safely, but drugs usually have adverse effects as well as good effects."

Mayo Clinic:

Cancer refers to any one of a large number of diseases characterized by the development of abnormal cells that divide uncontrollably and have the ability to infiltrate and destroy normal body tissue. Cancer often has the ability to spread throughout your body.

Immunity

Innate Immune Defenses
https://youtu.be/Vp9Ik_m7gFE

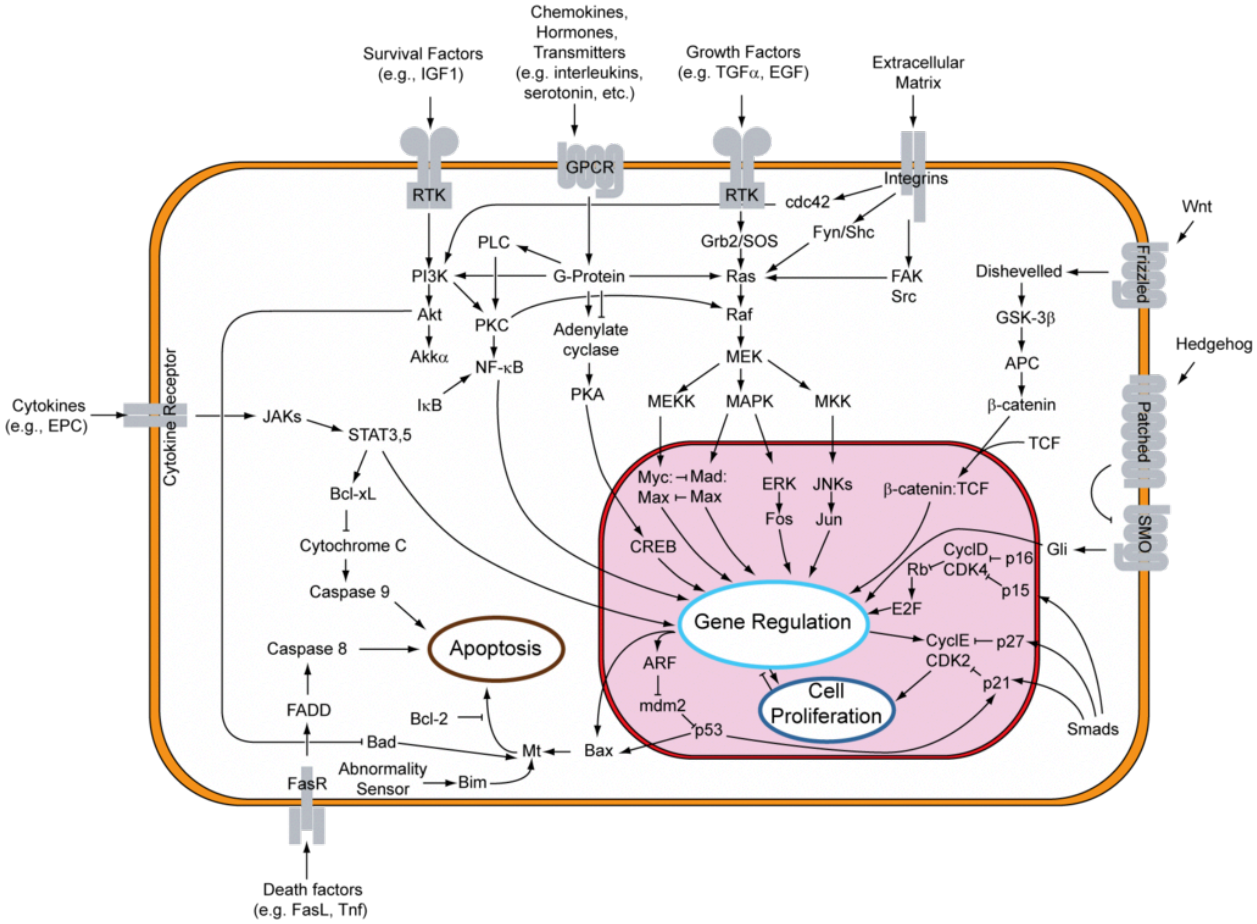
Adaptive Immunity, Part 1
https://youtu.be/v8RlCAndGuw

Adaptive Immunity, Part 2
https://youtu.be/tfx5kGxsA0ESections:

Virology Lectures 2020 #13: Intrinsic and innate defenses
https://youtu.be/F9TClYS_Ch0

COVID and the ACE-2 surface protein
https://youtu.be/W1k1sUoLPlA

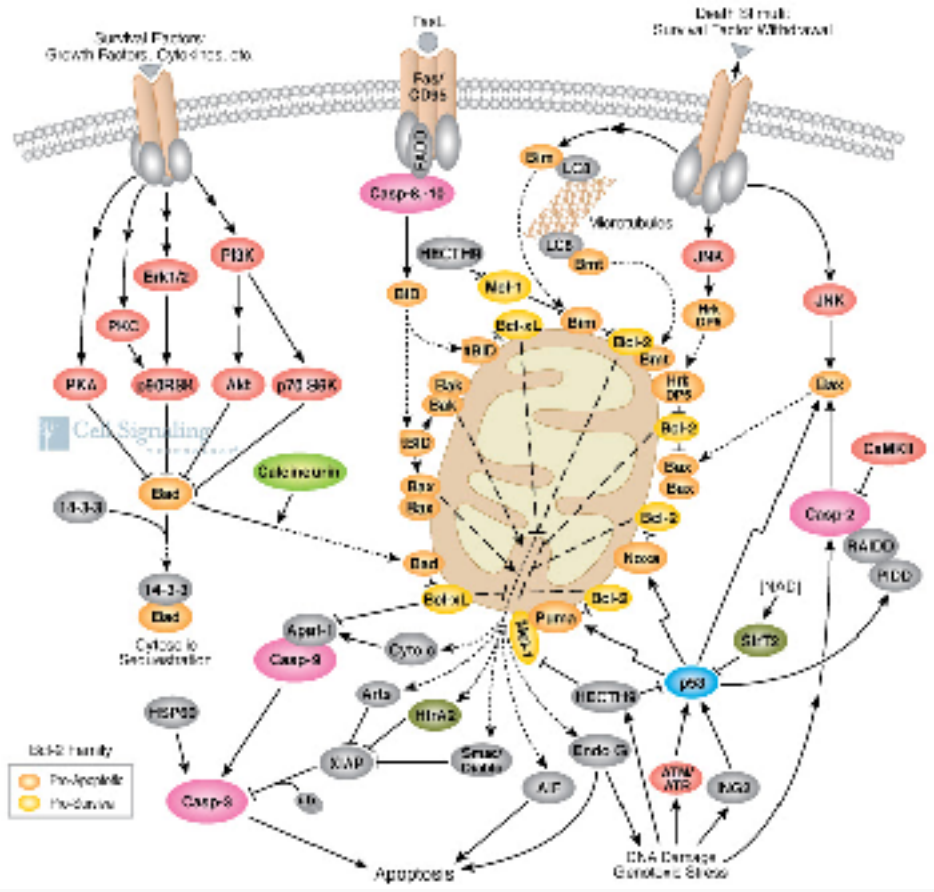
Start with Cytokines, and go clockwise.



Apoptosis Pathways:

1. Cytokine Signaling pathway
1.5 JAK STAT pathway
2. PI3K/AKT/mTOR pathway t
3. Adenylate Cyclase-dependent pathway
4. Grb2/SOS pathway
5. Extracellular Matrix
6. Wnt signaling pathways
7. Hedgehog signaling pathway
8. Death Factors- FasL & TNF
9. TGF-β/Smad pathway
10. Cyclins and CDKs cell cycle regulation
11. Intrinsic and Extrinsic pathways
20. Autophagy
30. Epigentics

Bcl-2 Family around the Mitochondria



Akt Pathway

Cancer Drugs use Apoptosis Pathways To Work.

Aging (Albany NY). 2016 Apr;8(4):603-19. doi: 10.18632/aging.100934.

Apoptosis as Anticancer Mechanism: Function and Dysfunction of Its Modulators and Targeted Therapeutic Strategies

Free PMC article

Abstract

Apoptosis is a form of programmed cell death that results in the orderly and efficient removal of damaged cells, such as those resulting from DNA damage or during development. Apoptosis can be triggered by signals from within the cell, such as genotoxic stress, or by extrinsic signals, such as the binding of ligands to cell surface death receptors. **Deregulation in apoptotic cell death machinery is an hallmark of cancer.** Apoptosis alteration is responsible not only for tumor development and progression but also for tumor resistance to therapies. **Most anticancer drugs currently used in clinical oncology exploit the intact apoptotic signaling pathways to trigger cancer cell death. Thus, defects in the death pathways may result in drug resistance so limiting the efficacy of therapies.** Therefore, a better understanding of the apoptotic cell death signaling pathways may improve the efficacy of cancer therapy and bypass resistance. This review will highlight the role of the fundamental regulators of apoptosis and how their deregulation, including activation of anti-apoptotic factors (i.e., Bcl-2, Bcl-xL, etc) or inactivation of pro-apoptotic factors (i.e., p53 pathway) ends up in cancer cell resistance to therapies. In addition, therapeutic strategies aimed at modulating apoptotic activity are briefly discussed.

Keywords: apoptosis; cancer; defective apoptotic pathways; miRNAs; p53; small molecule.