Presents

4. Never Fear Cancer Again?

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Brain References
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Cancer cells are cells that have lost their ability to divide in a controlled manner

- Damage to cell DNA
- Possible viral infection
- Mutation during cell division
- Response to toxins (tobacco)
- Exposure to radiation / chemotherapy
- Working with asbestos, etc
Estimates are that the average person has somewhere between 100 and 10,000 pre-malignant or malignant cells in the body at any given time.

Whether these cause disease or not depends on a host of factors including the health of the immune system.
Although many factors contribute to developing cancer, there are only two fundamental causes for all disease:

**Nutrient deficiency and Toxicity**

The cancer process requires a specific body environment to sustain itself—stop creating the conditions that allow it thrive

— Raymond Francis M.Sc. and Harvey Diamond

Authors: *Never Fear Cancer Again*
Each patient carries his own doctor inside him — we are at our best when we give the doctor who resides within a chance to go to work

—Albert Schweitzer MD

Studies are showing how you can give the doctor within you a chance to go to work
What Is a Tumor?

A human tumor is a tiny microscopic collection of abnormal cells somewhere in the brain and/or body.

Due to lack of oxygen and other essential nutrients, on their own these tumors cannot grow much beyond 1-2 mm\(^3\) -- the size of the tip on a ball-point-pen tip.
Vehicle-accident autopsies:

- 40% of woman ages 40-50 showed microscopic breast cancer tumors
- 50% of men ages 50-60 showed microscopic prostate cancer tumors
- 100% of people by age 70 showed microscopic thyroid cancer tumors
Angiogenesis

Angio – from Greek meaning blood vessels
Genesis – from Latin meaning the beginning of something

- Angiogenesis is the process of growing new blood vessels (especially new capillaries)
- For the purpose of allowing oxygen and nutrients to reach the cells (tumor)
Angiogenesis occurs normally in the human body at specific times in development and growth. The fetus must create the vast network of arteries, veins, capillaries, and lymph vessels found in the human body:

- 60,000 miles of blood vessels
- 240,000 miles of lymph vessels
- 19 billion capillaries
Normal Angiogenesis in Children
Relatively infrequent during adulthood

✓ In women, new blood vessels form in the lining of the uterus during menstrual cycle

✓ Needed for the repair or regeneration of tissue during wound healing
Normal Angiogenesis in Adults

Angiogenesis in uterine lining

Angiogenesis in tissue during wound healing
The walls of blood vessels are lined with a thin layer of vascular endothelial cells (lymph vessels are lined with lymphatic endothelial cells)

These cells divided on an average of once every three years

NOTE: angiogenesis can stimulate them to divide and multiply
Angiogenesis Regulation

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Is done by *activator* and *inhibitor* molecules—activators trigger growth while inhibitors block growth

Normally, the inhibitors predominate, blocking growth

During the process of transitioning tumors from a dormant to a malignant state (able to metastasize), however, inhibitors ↓ and activators ↑
Angiogenesis and Regulatory Proteins

Concentration of Angiogenesis Inhibitors

- Inhibitors high
- Activators low

- Inhibitors low
- Activators high

Rare cell division

Frequent cell division

Blood vessel
Before the 1960s, cancer researchers believed that the blood supply reached tumors simply because pre-existing blood vessels dilated. But experiments have now shown that angiogenesis—the growth of the new blood vessels—is necessary for cancerous tumors to keep growing and spreading.

—William Li MD   Angiogenesis Foundation
Angiogenesis and Cancer

Old Theory

Vessel dilation

New Theory

Angiogenesis
How the Process Works

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1. Tumor cells secrete growth factors (VEGF, bFGF) that bind to endothelial cell receptors in the lining of blood vessels, which activate the growth of new capillaries (angiogenesis) in order to bring oxygen and nutrients to the tumor.

2. Tumor cells stop producing the enzyme PKG, an anti-VEGF or inhibitor.
What Is Tumor Angiogenesis?

Small localized tumor

Angiogenesis

Tumor that can grow and spread

Blood vessel

Signaling molecule

National Cancer Institute
What Is Metastasis?

1. Cancer cells invade surrounding tissues and vessels

2. Cancer cells are transported by the circulatory system to distant sites

3. Cancer cells reinvade and grow at new location
Metastasis Requires Angiogenesis
Cells inside the human body are usually tethered to a structural support system known as the extracellular matrix (ECM). Proteins called integrins, located on cell surfaces, form the anchors that hold the cells in place. When cancer cells metastasize, these anchors let go.

As cancer cells become more metastatic, there can be a corresponding loss of adhesion to the ECM and an increased ability to stick to, and grow on, molecules that are not normally found in healthy tissues but are found in sites of tumor metastases.

—Institute for Integrative Cancer Research at MIT
Much as with tumors, fat tissue is highly angiogenetic — estimates are that one pound of excess fat may contain about 100 miles of capillaries. Anti-angiogenesis factors may, therefore, have a potentially positive impact on obesity. Maintain an optimum weight — obesity can have negative effects on brain function as well as on immune function.
Animal and human studies have shown a correlation between uncontrollable stressors and angiogenesis:

- Examinations
- Caregiving
- Abandoned by partner
- Child dies
- Chronic Illness
- Dementia / Alzheimer’s in family
Biocommunication is Real
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White cells taken from inside the mouth, placed in a test tube, and separated from the person’s body

Tested at distances of from five meters to twelve kilometers

Net electrical potential activity of the in vitro leukocytes was monitored through the use of EEG-type instrumentation
There was a reaction in the separated white cells when the donor experienced specific emotions such as anger or fear—even when miles apart from the donor.

Minimal reaction was noted when the donor experienced joy or pleasure.
Most research has been directed toward what can be done to kill cancer cells.

Dr. Li directed his research to what could be added to one’s food intake to starve cancer cells.

Hear a you-tube clip of William Li, MD

TED – Dr. Wm Li – Angiogenesis Foundation
Foods that can help to fight cancer should be high in:

- **Brassinin**: Bok Choy, Cabbage, Broccoli, Cauliflower
- **Lycopene**: Tomatoes
- **Omega 3 Fatty Acids**: Fish, Tofu
- **Antioxidants**: Strawberries, Blueberries, Artichokes
Some foods starve cancer cells:

- **Red Grapes:** resveratrol (antioxidant / antimutagen) and fisetin (flavonoid / antioxidant)
- **Blueberries / Cranberries:** resveratrol, delphinidin (anthocyanidin antioxidant)
- **Strawberries:** ellagic (antioxidant) and fisetin
- **Mangoes:** fisetin
- **Soy:** (phytoestrogen / antioxidant)
Inhibitors, Cont’d

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- **Beets**: betalain (antioxidant)
- **Tomatoes**: lycopene (phytochemical)
- **Garlic**: allicin (phytochemical / antioxidant)
- **Bok choy, cabbage, cauliflower, broccoli**: brossinen (phytoalexin)
- **Papaya**: lycopene (phytochemical) and beta-cyrptoxanthin (carotenoid free-radical scavenger)
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Source: Angiogenesis Foundation (www.angio.org)
Summary According to Dr. Li
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✓ If you can reduce angiogenesis, you can slow down tumor growth

✓ If you can block angiogenesis, the tumor cannot grow

✓ If you can stop angiogenesis, the tumor cannot metastasize

Your food choices are responsible for 30-35% of a cancer-friendly environment

—William Li MD Angiogenesis Foundation
Each patient carries his own doctor inside him—we are at our best when we give the doctor who resides within a chance to go to work

—Albert Schweitzer MD

Studies are showing how you can give the doctor within you a chance to go to work—reducing angiogenesis
Emerging research is beginning to build a case for the role of nutrition in angiogenesis – especially as it relates to tumor development and metastasis.

Your food choices, weight, and strategies for managing stress are factors within your partial if not complete control.