Cancer Causation: Occupational and Environmental Chemicals

Over 50 specific chemicals or chemical processes are known to be carcinogenic in humans

May account for 5-20% of all cancers

Preventable and requires ongoing surveillance
Non-carcinogenic agents can enhance carcinogenesis.

Examples:
- Asbestos
- Hormones
- Tumor promoters: Phorbol esters, Phenoxybenzamine, TCDD
- Various halogenated compounds

Note that of 135 rodent carcinogens in the NTP data base 33% are non-carcinogenic.

Diet and Cancer

- Risk Factors
  - Positive energy balance (not necessarily high dietary fat)
  - Physical inactivity
  - Increased consumption of red meat
  - Excessive alcohol consumption

- Protective Factors
  - Fruits and vegetables
  - Polyunsaturated fats
  - Physical activity
  - Weight control

Diet and Human Cancer

Adapted from:

Correlation Between Colon Cancer incidence and Meat Consumption

Multifactor Interactions

Factor 1
Factor 2, 3...
Host Factors
Cancer is likely to arise from combinations of etiological factors.

In Lanzhou, a region in northern China, circumstances are as follows:

1. The incidence of gastric cancer is high.
2. Helicobacter pylori infection is prevalent.
3. The year-round diet contains a high proportion of salted & spiced foods.
4. Consumption of vegetables is seasonal.

**Diet and Cancer**

**Risk Factors**
- Positive energy balance (not necessarily high dietary fat)
- Physical inactivity
- Increased consumption of red meat
- Excessive alcohol consumption

**Protective Factors**
- Fruits and vegetables
- Folic acid
- Physical activity
- Weight control

**American Cancer Society Dietary Guidelines**

1. Avoid obesity.
2. Cut down on total fat intake.
3. Include a variety of vegetables and fruits in the daily diet.
4. Eat more high fiber foods, such as whole grain cereals, vegetables, and fruits.
5. Limit consumption of alcoholic beverages, if you drink at all.