What is “Hematology”?

- “The medical specialty concerned with disorders of the blood and blood-forming elements.” – American Society of Hematology (ASH)
- This includes:
  - Cellular elements in the circulating blood
  - Bone marrow
  - Lymph nodes and other lymphocyte sites
  - Spleen
  - Clotting factors

Who Is Your Hematologist?

- Typical training (US) – 13+ years post-H.S.:
  - 4 or 5 years college/university
  - 4 years medical school, leading to MD degree
  - 3 years internal medicine internship/residency
  - 3-4 years hematology/medical oncology fellowship
    • Specialty board certification by American Board of Internal Medicine (ABIM)
- Optional: additional research training, other degrees (e.g. PhD)
- Outside US, university/medical school are combined into a single 6-7 year program
Peripheral Blood Examination

Bone Marrow Examination

- Local anesthetic vs. sedation
- Use of aspirate vs. biopsy
- Why the hip?

Biopsy illustrations from NIH (US Gov rights-free)
Marrow Aspirate vs. Biopsy: Complementary Assays

Liquid Aspirate

Fixed, cut core biopsy

Courtesy Dr Rebecca McClure, Mayo Clinic Hematopathology

Cytogenetic and Molecular Tests

Karyotype – whole chromosomes

DNA sequencing – base pair changes

Cytogenetic and Molecular Tests

FISH probes – large DNA segments or individual genes

What Is Meant By “Bone Marrow Failure”? 

- Due to an intrinsic defect of the marrow cells or external suppression, the bone marrow fails to keep up with the body’s needs for production of healthy blood cells
- Conditions included in this category:
  - Inherited conditions (most are very rare)
    - Fanconi anemia, Diamond Blackfan anemia, Congenital Dyserythropoietic Anemia, etc.
  - Acquired conditions
    - Aplastic anemia
    - Paroxysmal nocturnal hemoglobinuria
    - Myelodysplastic syndromes
Therapies Employed

- Blood cell growth factors
- Transfusions
- Immune suppressing/modulating therapy
- Chemotherapy/cytotoxic treatments
  - Systemic (vein), intrathecal (spinal fluid)
- "Biological therapy" (Aren't they all?)
- Stem cell transplantation
  - Autologous vs allogeneic
  - Related vs unrelated (incl. cord blood)
  - Full conditioning vs reduced intensity
- Radiation therapy

Types of Clinical Trials

- Industry-sponsored
- Co-operative group
- Phase I, II, III

Collaborators

- Nurses
- Caregivers/family
- Physicians assistants and nurse practitioners
- Pharmacists
- Surgical teams
- Pathologists
- Radiotherapists
- Social workers
- Physical/occupational therapists
- Respiratory therapists
- Specialists in other disorders
- Radiologists
- Clinical trial specialists
- Industry liaisons
- Office staff
- Billing/insurance specialists
- Chaplains
- Hospice workers
Hope is dynamic, not static.

Crying Giant
Sculptor: Tom Otterness
Scheveningen, NL

Hope, Arizona
city limits