ACUTE MYELOID LEUKEMIA

- Neoplastic accumulation of immature myeloid cells (> 20%) in the bone marrow
- Myeloblasts are usually characterized by positive cytoplasmic staining for myeloperoxidase (MPO).
  - Crystal aggregates of MPO may be seen as Auer rods.
- Most commonly arises in older adults (average age is 50-60 years)
- Sub-classification based on cytogenetic abnormalities, lineage of immature myeloid cells, and surface markers. High-yield subtypes include
  - Acute promyelocytic leukemia (APL)
    i. Characterized by t(15;17), which involves translocation of the retinoic acid receptor (RAR) on chromosome 17 to chromosome 15; RAR disruption blocks maturation and promyelocytes (blasts) accumulate.
    ii. Abnormal promyelocytes contain numerous primary granules that increase the risk for DIC.
    iii. Treatment is with all-trans-retinoic acid (ATRA, a vitamin A derivative), which binds the altered receptor and causes the blasts to mature (and eventually die).
  - Acute monocytic leukemia
    i. Proliferation of monoblasts; usually lack MPO
    ii. Blasts characteristically infiltrate gums
  - Acute megakaryoblastic leukemia
    i. Proliferation of megakaryoblasts; lack MPO
    ii. Associated with Down syndrome (usually arises before the age of 5)
- AML may also arise from pre-existing dysplasia (myelodysplastic syndromes), especially with prior exposure to alkylating agents or radiotherapy.
  - Myelodysplastic syndromes usually present with cytopenias, hypercellular bone marrow, abnormal maturation of cells, and increased blasts (< 20%).
  - Most patients die from infection or bleeding, though some progress to acute leukemia.