ALOPECIA AREATA
OBJECTIVES

- Overview of Alopecia Areata
  - Normal Hair
  - Pathogenesis
- Available therapies
  - Topical Immunotherapy in AA
  - Delayed-Type (type IV) Hypersensitivity
- Conclusions
OVERVIEW

- Most frequent cause of inflammation-induced hair loss
  - 4.5 million people in US
  - 2% lifetime risk
  - 66% are younger than 30

- Can result in patchy hair loss, complete scalp hair loss, or total body hair loss
  - In one study, 30% with patchy loss went onto total scalp hair loss

- Natural history includes spontaneous relapse and remission

NORMAL HAIR

- **Anagen**: growth
- **Catagen**: regeneration
- **Telogen**: resting
- **Exogen**: shedding

Process of melanogenesis is HIGHLY immunogenic!

Fortunately, hair follicle enjoys immune privilege
- Like anterior chamber of eye, CNS, fetomaternal unit, portions of testes and ovaries

For follicle, this represents down-regulation of MHC I and II and decreased quantities of Langerhans cells

PATHOGENESIS

AVAILABLE THERAPIES

- **Immunosuppression**
  - Intralesional or topical corticosteroids
  - Sulfasalazine
  - Systemic steroids
  - MTX, cyclosporine, azathioprine, and other immunosuppressants

- **“Immune-deviation”**
  - Anthralin
  - Topical Immunotherapy

SADBE (squaric acid dibutylester)
DPCP (diphenylcyclopropenone)

Molecules act as haptens and provoke a delayed-type (type IV) hypersensitivity reaction

AKA contact dermatitis

DELAYED-TYPE (TYPE IV) HYPERSENSITIVITY

- Allergen presented via MHC I on APC
- Interactions with Th1 → sensitization
- Memory T-cells persist
- Further exposure causes T-cell activation and immune cascade

Contact dermatitis induces inflammatory cascade in skin and hair follicles

- Proposed mechanisms
  - Perifollicular lymphocyte apoptosis
  - Antigenic competition
  - Change in peribulbar CD4+/CD8+ lymphocyte ratio
Case series of DPCP (n=148)
- 17% of AT/AU had “cosmetically acceptable regrowth”
- 60% if 75-99% hair loss
- 88% if 50-74% hair loss
- 100% if <50% hair loss

But in <40% loss, no better than placebo

Alopecia Areata is a common autoimmune disease resulting in patchy to total hair loss.

Pathogenesis is believed to be loss of immune privilege of the hair follicle.

Topical immunotherapy, which utilizes a type IV hypersensitivity mechanism, provides a means of interrupting the T-cell mediated attack on hair follicles.