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**Mechanisms of Evading the Immune Response (Fig 16.5)**

1. Hit and Run Strategy.
2. Concealment of Antigens.
3. Induction of Tolerance.
4. Immunosuppression.
5. Antigenic Variation.

**Hydatid Cysts of *Echinococcus granulosus* (type of tapeworm).**

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**Hit and Run Strategy**

- Disease so short-lived (< 1 week) that before immune response is active, pathogen has left body.
  - Strong immune response: requires continued presence of pathogen (presence of antigen fine tune response). If pathogen has exited, only weak response occurs.
- Hit and run strategies require rapid replication of pathogens.
- Pathogens using hit and run strategy are organisms that cause disease multiple times, even in individuals with fully functional immune responses.
- Examples:
  - Colds
  - Influenza
  - Viral and Bacterial Diarrhea

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### Antigenic Variation During the Course of Infection: DNA Recombination (Fig 27.4 & 27.6)

- *Borrelia recurrentis*: vector-transmitted spirochete causing relapsing fever.
- Characterized by repeated bouts of high fever lasting weeks or months.
- Bacteria enter, multiply in tissues, enter blood stream, and cause fever until onset of an immune response (~1 week).
- Immune system kills pathogen by antibody mediated phagocytosis and complement lysis. Organisms disappear.
- 4-10 days later, an antigenically distinct mutant appears in blood, causes another attack of fever. Immune system responds with new antibody, organism again disappears. 4-10 days later, a new mutant appears.
- Cycle continues for up to 10 episodes of fever before organism is eliminated.
- Each variant requires a new set of antibodies.
- Variation of antigens allows relapsing fever to be picked up and transmitted by vector for a longer time than would occur if pathogen was eliminated on first encounter.
- Pathogen has up to 30 genes coding for different surface proteins stored in plasmids. Spontaneous recombination of plasmid with bacterial chromosome occurs in 1:1000-1:10,000 bacteria in each generation.
- New surface antigens produced.

