

## Counterpoint: Long-Term Antibiotic Therapy Improves Persistent Symptoms Associated with Lyme Disease

PowerPoint Slide for Teaching

(Downloading may take up to 30 seconds. If the slide opens in your browser, select File -> Save As to save it.)

Click on image to view larger version.

### Immunosuppression

- Tick saliva components
- Complement inhibition
- Inhibitory cytokine induction (IL-10)
- Lymphocyte/monocyte tolerization
- Antibody sequestration in immune complexes

### Genetic, phase, and antigenic variation

- Gene switching (trypanosomes)
- Mutation/recombination (HIV)
- Variable antigen expression (*Neisseria* species)
- Dormant state, autoinduction (*Mycobacterium* species)
- Fibronectin binding (*Staphylococcus* and *Streptococcus* species)

### Physical seclusion

- Intracellular sites
  - Multiple cell types (synovial cells, endothelial cells, fibroblasts, macrophages, Kupffer cells, and nerve cells)
  - Persistent infection in vitro (8 weeks)
- Extracellular sites
  - Privileged sites (joints, eyes, and CNS)
  - Cloaking mechanisms (binding to proteoglycan, collagen, plasminogen, integrin, and fibronectin)

### Secreted factors

- Hemolysin (BlyB)
- Porin (Oms 28)
- Adhesin (Bgp)
- Pheromones (DPD/AI-2)
- Aggrecanase (ADAMTS-4)

**NOTE.** See text for explanation and references.

**Table 1**  
 "Stealth" pathology of *Borrelia burgdorferi*.



Other Oxford University Press sites: