

Effect of Dapsone and its Antimicrobial Combinations on *Borrelia burgdorferi* Biofilms.

Amber Fearnley, Biology

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Abstract:

Recent evidences show that standard antibiotics used to treat Lyme disease are not effective on *Borrelia* persisters and biofilms, which could be the contributing factor to frequent Lyme disease relapses after antibiotic treatments.

Therefore, there is an urgent need to find antibiotics, which can eliminate those antibiotic resistant cells. Dapsone an antibiotic used for the leprosy were proven to be effective for bacterial persisters and a recent clinical trial showed their significant effectiveness in the treatment of 100 Chronic Lyme disease patients.

Therefore, the objective of this study was to evaluate these antibiotics individually and in combination for the different forms of *Borrelia* (spirochetes, round bodies, persisters and biofilm) by various *in vitro* viability cell assays and microscopy methods.

The results from this study demonstrated that combinations of Dapsone with Doxycycline and rifampin or Dapsone with Doxycycline and cefuroxime significantly reduced the *Borrelia burgdorferi* biofilm, persisters, and spirochetes. These results were further confirmed by atomic force and confocal microscopy. Further evaluation of the effectiveness of these antibiotic combinations on *Borrelia* could help in finding a more effective and lasting therapeutic strategy for Lyme disease patients.

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