

New Dapsone Study: Breaking Biofilm



Dr. Richard Horowitz, lead-author: Effect of dapsone alone and in combination with intracellular antibiotics against the biofilm form of *B. burgdorferi*

New in vitro study on dapsone (diaminodiphenyl sulfone), and dapsone combination therapy (DDS CT) was just published by Dr. Richard Horowitz et al. and provides hope of effective treatment for patients with persistent Lyme disease.

The study is suggestive that dapsone combination therapy may well characterize both a novel and successful option to treat *Borrelia burgdorferi* persister cells in the form of biofilm.

There are several hypotheses causing great controversy regarding the persistent symptoms that greater than 10-20% of patients are experiencing after infection with *B. burgdorferi*. The study evaluated the effectiveness of dapsone against *B. burgdorferi* biofilm forms of the bacteria by testing in individual as well as in combination therapy with several

drugs including cefuroxime, doxycycline, rifampin, and azithromycin *in vitro*.

The results were robust, showing that using dapsons alone or in various combinations with the above stated drugs significantly reduced the mass and protective glycosaminoglycan layer affecting the capability of the biofilm form of *B. burgdorferi*. DDS CT efficacy on the *B. burgdorferi* biofilms was also determined by ascertaining the biofilm polysaccharide matrix content, glycosaminoglycans (GAG).

Study results showed the most efficient single use antibiotic at reducing biofilm was dapsons at both 10 μM and 50 μM concentrations, showing 69% and 58% residual viability respectively. Used individually, other antibiotic treatments (doxycycline, cefuroxime, and azithromycin) proved to be less efficient and, in some cases, even caused an increase biofilm mass. In contrast, triple and quadruple combination antibiotic therapies showed greater efficacy. The most significant finding was that dapsons used individually or in combination therapy with rifampin, and a tetracycline and/or a macrolide and/or a cephalosporin showed great promise in the treatment of persistent Lyme patients, with prior clinical studies demonstrating improvement in many of the debilitating symptoms that patients suffer including fatigue, pain, neuropathy, sleep disturbances, cognitive dysfunction, sweats and flushing. It is urgent that randomized trials are launched to evaluate the clinical effectiveness of DDS CT as the spread of Lyme disease continues to increase on a global scale.

Read the full journal article: Effect of dapsons alone and in combination with intracellular antibiotics against the biofilm form of *B. burgdorferi*

Read the 2016 article: The Use of Dapsons as a Novel "Persister" Drug in the Treatment of Chronic Lyme Disease/Post Treatment Lyme Disease Syndrome