

In culture, novel combinations of antibiotics prove effective for Lyme disease

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The authors identified, from an FDA drug library and an NCI compound library, three sulfa drugs and trimethoprim for study. “Dapsone, sulfachlorpyridazine and trimethoprim showed very similar activity against stationary phase *B. burgdorferi* enriched in persisters; however, sulfamethoxazole was the least active drug among the three sulfa drugs tested.” [1]

[Combinations of antibiotics](#) were more effective in eradicating *B. burgdorferi* in stationary phase cell culture.

- Sulfa drugs combined with other antibiotics were more active than their respective single drugs;
- Four-drug combinations were more active than three-drug combinations;
- Four-drug combinations (dapsone + minocycline + cefuroxime + azithromycin and dapsone + minocycline + cefuroxime + rifampin) showed the best activity;
- Four-sulfa-drug-containing combinations still had considerably less activity than daptomycin + cefuroxime + doxycycline used as a positive control which completely eradicated *B. burgdorferi* stationary phase cells.

Dapsone, trimethoprim and sulfamethoxazole are drugs on the market for other indications. Dapsone is an antibiotic commonly used in combination with rifampicin and clofazimine for the treatment of leprosy that can lead to hemolysis, methemoglobinemia, hepatitis, cholestatic jaundice, and rashes. The combination of trimethoprim and sulfamethoxazole are marketed under the names Bactrim and Septra. Sulfachlorpyridazine is not currently used.

Daptomycin is used in the treatment of systemic and life-threatening infections of the skin and skin structure, such as *Staph aureus* bacteraemia, and right-sided *Staph aureus* endocarditis. It is marketed in the United States under the trade name Cubicin. Side effects include high and low blood pressure, swelling, insomnia, diarrhea, abdominal pain, eosinophilia, dyspnea, injection site reactions, fever, hypersensitivity. Rare cases of eosinophilic pneumonia have been reported. Myopathy and rhabdomyolysis have occurred in patients concurrently taking statins.

The authors stressed the need for further study in vitro and in animal models.

References:

1. Feng J, Zhang S, Shi W, Zhang Y. Activity of Sulfa Drugs and Their Combinations against Stationary Phase *B. burgdorferi* In Vitro. *Antibiotics (Basel)*, 6(1) (2017).

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