# Developing a Cost-Effective Alternative to Treating Small Intestinal Bacterial Overgrowth (SIBO)

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Small Intestinal Bacterial Overgrowth (SIBO) is a poorly understood disease that is characterized by the overgrowth of bacteria in the small intestine. Our current and most researched treatment for SIBO is rifaximin, which is not only an incredibly costly antibiotic that insurance companies tend to not cover, but it is also an ineffective antibiotic with an average eradication rate of 60% and a relapse rate of 45%. This experiment focused on developing a cost-effective alternative to treating SIBO. The alternative treatment consists of Berberis vulgaris and Azadirachta indica, two plants that possess high levels of antimicrobial compounds. These plants were combined with pure ethanol, pure water, or 1:1 ethanol water dilutions to determine their efficacy in 96-well plates assays upon Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis, Enterococcus faecalis, and Micrococcus luteus, five bacteria associated with SIBO. These assays recorded fluorescence, or the viability of bacteria, and compared the treatment to rifampicin, an alternative for rifaximin. In all assays, the alternative treatment decreased bacterial growth at a more consistent and effective rate than that of rifampicin. The results of these experiments portray the new treatment's abilities at being an effective, cheaper, and more accessible treatment alternative to rifaximin. This new development has the ability to aid millions by improving patient quality of life, reducing antibiotic usage, and preventing harmful bacterial overgrowth in weakened hosts. The treatment is currently being tested upon mammalian cell cultures and will later undergo bioassay guided fractionation (BGF).

**Awards Won:**
Fourth Award of $500