

## Liberty University Research Symposium 2016 Proposal

**Title** - Investigation of the parasympathetic effects of lavender essential oil in humans

**Program of Study** – Biomedical Sciences, Department of Biology & Chemistry

**Presentation Type** –Print Poster

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**Category:** Experimental (Theoretical)

### Abstract:

Therapeutic essential oils are a rapidly growing commodity in the alternative medicine industry. Touted by many in the naturopathic community as a “magic bullet” of sorts, claims regarding the oils’ supposed medicinal effects cover a broad range of maladies, from mitigating acne to reducing anxiety. Although more research has recently been focused on essential oils, relatively few peer-reviewed studies have been conducted that demonstrate that these claims withstand rigorous scientific scrutiny. In response to this lack of research, the US Food & Drug Administration (FDA) has taken steps to regulate claims made by oil retailers and distributors, in the interest of consumer safety and reducing public misinformation until more studies can be done. The purpose of this study is to specifically investigate the claim that topical and/or respiratory administration of lavender (*Lavendula angustifolia*) oil produces a relaxative effect. This investigation will be conducted in two stages. Due to the involvement of human subjects, IRB approval will be obtained before beginning any part of the study. Stage one is a double-blind study which seeks to test for the absolute and relative effectiveness of lavender oil at enhancing relaxation. Vital signs for each subject will be obtained as a baseline, and then

subjects will participate in a brief bout of physical activity to induce stimulation of the sympathetic nervous system—the branch of the autonomic nervous system that prepares the body for a fight-or-flight response. Subjects will be asked to complete a short risk assessment survey prior to being allowed to participate in the exercise. Immediately following activity, groups of subjects will be administered lavender oil (topical), lavender oil (respiratory), and a placebo oil. A fourth group will be instructed to smell a lavender-scented item containing no oil, and a final (control) group will receive no intervention. Vitals (blood pressure, respiratory and heart rates) will be taken three times throughout the duration of the experiment: 1. Relaxed baseline: prior to physical activity, as aforementioned, 2. Stressed baseline: between pre-intervention and intervention periods, and 3. post-intervention. These three data points will be analyzed for depressions, indicating the stimulation of a parasympathetic response, and data will be compared group-by-group to assess the relative effectiveness of each modality. Stage two of the study will focus on the modalities which were shown to have a parasympathetic effect, in an effort to identify which specific compound(s) are producing the effect. Therapeutic-grade lavender essential oil contains several constituent compounds, primarily linalool (25-38%), linalyl acetate (24-45%), *cis*-beta-ocimene (4-10%), *trans*-beta-ocimene (1.5-6%), and terpinene-4-ol, with trace amounts of other compounds (Essential Oils Desk Reference, 2009, Essential Science Publishing). Isolated samples of each of these compounds will be procured and administered to the subjects in the same concentrations found in whole lavender oil. All other protocol will be identical to stage one. Data will be analyzed following the trial to determine which of the individual constituent compounds produced parasympathetic responses, and of these, which one(s) induce the greatest effect.

**Christian worldview integration:**

The biblical worldview emphasizes the reality of objective truth, the existence and the attributes of God, and the dignity of humanity. This understanding naturally promotes honest medical practice. Physical healings, as evidenced throughout the Bible, not only serve as witness to the power of God over nature but also tangibly demonstrate God's desire for the physical well-being of humans. Christians who desire the spread of God's kingdom naturally support practices that benefit the body, regardless of whether they are recent medical innovations or natural plant-based remedies known for their therapeutic value for thousands of years. Therefore, the Christian researcher should search diligently for the most effective and the most affordable treatments and therapies. Furthermore, any dishonesty or exaggeration in claims that may be propagated by companies interested in appealing to customers should be combated with unbiased third-party research. The researchers who propose this experiment seek to fairly assess the effectiveness of an oil that purportedly calms the body and provides many other benefits. If the marketing of the product has deceived consumers to any degree, the Christian researcher is motivated to reveal the truth. This research project could also benefit consumers by determining the most efficient method for application of the oil if it is confirmed to produce the desired effects. If, during testing, a particular constituent compound in the essential oil is found to be the primary source of the parasympathetic stimulation, this would open up the possibility for an isolated version of this compound to be utilized in place of the complete oil, increasing efficiency and reducing cost. Because of the significant medical and economic advantages that could result from the discovery of better scientific knowledge of the essential oil, altruism motivates the researchers to formulate a constructive study.