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Extract Augments Immune Responses that Diminish Bacterial Infection

Francisella tularensis is a highly infectious bacterium that causes tularemia. Currently, there are no legal treatments in the United States. Because of the highly infectious nature of *F. tularensis*, this organism can be used in bioterrorism. Therefore, to counteract this potential threat, development and discovery of novel treatments is highly desired. During human infection, *F. tularensis* replicates in phagocytic cells of the immune system such as monocytes and macrophages. Through a high throughput screen, we previously identified that Whitebark Pine extract (*Pinus albicaulis*) inhibited replication *F. tularensis* within monocytes. Bio-assay guided fractionation was used to isolate the compounds responsible for the aforementioned activity. Here, *Galleria mellonella* larvae were infected with *F. tularensis* LVS (an attenuated type B strain) and were treated with fractions of the Whitebark Pine extract. Infected larvae treated with one such fraction (referred to as Pa-9) exhibited significant survival compared to the mock-treated insects. Similar results were observed in chicken embryos infected with *F. tularensis* LVS that had been treated with Pa-9 suggesting that this fraction contained the active compound. To determine whether Whitebark Pine Extracts were directly antibacterial, an antibiotic disk-diffusion assay was used. None of the fractions tested inhibited the growth of bacteria outside the context of infection, indicating that this extract does not contain traditional antibiotic compounds. Further separation of Pa-9 produced four fractions, and testing of these fractions is ongoing.