**Bacteria Reacting to Stress**

Doctor Matthew Cabeen is an assistant professor at the Oklahoma State University. Cabeen has his PhD in Molecular, Cellular and Developmental Biology. He is a graduate from Yale University, a great college. Cabeen constructed a research on how bacteria sense and responds to stress, work in union to build microbial communities and communicate with each other. The research was conducted using advanced microfluids and live-cell microbiology along with some microbiology techniques. The species that were modeled in the research were the Bacillus subtilis and Pseudomonas aeruginosa. In the interview, it was asked to as what made Cabeen interested in starting such interesting research. He responded with, “Bacteria has to have ways to react to environment. They have to sense and react to some kind of stress.” He also mentioned the two reasons that made him intrigued. One of the reasons that lead him to the research was that bacteria has to somehow survive to the immune system. That the better that that is understood the more suitable it’d be. His second reasoning was that stress happens to all. It’s an insight to biology in general and humans. The research projects isn’t done by just him, he had some help of some other involvers. Cabeen had a collaborator, one grad-student, and two professors also working on it. The research is an interesting topic that not very many people think about. Microbes tend to have some type of respond under any kind of stressful conditions. In the research, it was seen that Bacillus subtilis has four stress sensors. In the interview, Cabeen also confirmed that there were four stress sensors. He also mentioned that for every stress sensor there were different response profile. Because bacteria is so small, they have to experience some kind of fast changes and they have to find a way react fast under stress. While in the research, they used a microfluidics to see the bacterial stress response. Dr. Cabeen had said that they added a type of stressor to the medium flow while using the microfluidics. Adding the stressor, Ethanol, they could see the lineage of the single-cells as they first encounter the stressor. They also observed the course of many cell generations to see how they then adapt to the stressor. As said before, there were results that came up from this experiment. They observed through advanced technologies and microfluidics that bacteria indeed does have types of ways to react under any kind of stress. The results of the research did show progress in the good way and they determined day by day how that was possible. Cabeen and the other researchers saw everything happen under the microscope. The final results were already stated before, but bacteria has four stress sensors to which they all have different response profile. This whole research took about one year to perform.

**Work Cited**

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