A Look into the Research of Dr. Sabrina Beckmann

Dr. Sabrina Beckmann is an assistant professor at Oklahoma State University in the department of Microbiology and Molecular Genetics. Dr. Beckmann obtained her Ph.D. in Germany and did a postdoc in Australia and Delaware. Her research mainly focuses on the bacteria known as methanogens and the basis on how to expand the methane production. This research is vital due to methane being a large part of the gas and coal humans use for power on a regular basis. Her research began with companies looking into a way to burn methane instead of coal and oil for energy production instead. Today she is researching a personal discovery and more on methanogens.

 Before going into her research, it is important to note the reason why methanogens are not able to rapidly produce methane due to the limited amounts of products that they can uptake. Dr. Beckmann described this in a metaphor: it is as if the methanogens are people and the people only were able to eat chocolate and icecream to make energy. If they are given broccoli then the person can not make energy and the product that is desired. Using this comparison, it is easy to understand the basis behind her research into methanogens and how it is important to maximize the overall output. One of the main inputs needed is electrons, the methanogens want to uptake items of more electrons in order to use them later. Therefore, methanogens want to uptake electron dense items in order to have a higher overall output.

Using this basic idea of a methanogen in her postdoc, Dr. Beckmann discovered something scientists termed a “magic crystal”. These crystals are a type of semiconductor mediator similar to a sponge that gives continuous electrons to the methanogen. This transfer of electrons makes the microbes less specific on their intake and allows all energy to be gained from the mediator. This overall makes the production of methane increase. This entire process is a relatively new discovery and is still being researched into today.

Today, research on methanogens and methane in general are being studied mainly by oil and gas companies as a source of alternative fuel. It is known that methane in the atmosphere traps sunlight and increases the amount of global warming, a recent project to start studying this and the methanogens. Other countries such as Australia are using food waste to gain methane for power generation. More research is needed on this subject, but Dr. Sabrina Beckmanns contributions have shown a path for future scientists to help eliminate the overall oil and gas emission global warming.