***Past, Present, and Future with OSU Professor***

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Dr. **Babu Fathepure** is a researcher and professor at OSU for the microbiology department. In our interview I spoke to him about his journey and what he is currently working on. This professor is someone who is looking to make a difference not just in his lab but out in the field. His study focuses on *aerobic* and *anaerobic* biodegradation petroleum hydrocarbons. Aerobic and anaerobic refers to the presence or absence of oxygen during the chemical breakdown process. [An aerobic organism functions in the presence of oxygen. Anaerobic organism functions in the absence of oxygen.]

I first began the conversation by asking **Dr. Fathepure** where he started out after getting his PhD. “I Worked for Conoco in Ponca City as a senior scientist and did research for the industry on contaminated sites and chemicals”. This is a competitive department that selects only top PhD students to do the company’s research. His department at Conoco focused on environmental services, “looking at how to degrade compounds in waste water, cheaper ways to degrade and what microbes can be used”. This was just short term research because of the work it took to take it to the field. This involves taking the research team, engineers, and field specialist to do the job. I asked him what benefit he got from his research there, “it was just opportunities to be published and attend conferences to speak. He chose to leave this company to begin his own studies and take charge of his own research. He now works in the microbiology department here at Oklahoma State because “A University is more fundamental”. His lab here is currently working on two major projects he mentions the main focus, “I came here in 2000 and worked in *bacterial hydrocarbon degradation,* looking at how to degrade petroleum in extreme environments”. [Microbial biodegradation of petroleum hydrocarbon pollutants employs the enzyme catalytic activities of microorganisms to enhance the rate of pollutants degradation.] He told me how oil production sites are highly contaminated from produced water and highly saline. “Hydrocarbons and salt do not allow microbes to grow”. He explained he was interested in finding a microbe that can live in a saline environment. Hydrocarbons can be good and bad; in certain situations, you want microbes that can eat the hydrocarbons so they don’t take over that environment. Thus far, he has been successful in finding the microbes that can do this. He asked me, what organism can we use that can live in salt environment and eat petroleum? Going into depth about the chemistry of these organisms and hydrocarbons, “*Benzene* is a much more complex organism to bacteria, it contains ten times as much salt as sea water.” His graduate students assist him in this lab to and help maintain the bacteria and what it likes and dislikes, keeping it stable. His lab is currently looking at the genes based on pathways that hydrocarbons degraded. **Dr. Fathepure**  is constantly looking at things that are organic to make something productive, “Can we use to crops such as switch grass to make biofuels”. I admire **Dr. Fathepure’s** effort to help our environment. In our conversation he disclosed that “[His] goal is to use organisms and remove hydrocarbons and still have salty water that is not harmful”.

His other project is with ligand. Ligand is in all plants and makes the plant green and protects cellulose and hemicellulose. “If ligand is removed by microbes or fungi, and what’s remaining is cellulose and hemicellulose (sugars) can be made to ethanol or butanol”. He discovered new microbes to do this that come from the termite gut and cow gut. **Dr. Fathepure** is still looking into what the organism is and its genes. This discovery can also benefit our environment. Making ethanol from plants would be very efficient. I asked what was his biggest discovery before OSU and he revealed that “when [he] worked on PCBs which contain bad contamination in ground water and cancer causing, [he] began using aerobic process to degrade those compounds”. He began this by going to an air force site called ‘escort’ in Michigan which is now a private abandon site. This field had biofuels from the planes in the ground and water nearby. How does someone go about fixing this problem, “I injected bacteria in the water to study how it could degrade those chemicals”. He mentioned the difficulties of this study, “the field is much harder than in the lab, it requires multiple people to be there to help with all the environmental and research factors”. **Dr. Fathepure** then told me his next goal for his research: “If we can find how to clean up waste water it will be a major change in oil industries and ways to recycle water will be beneficial. **Dr. Fathepure’s** lab is one I would love to watch and I think his research and goals are not just beneficial for the environment but beneficial to us as well. This professor’s interest in wastewater treatment and bioremediation is very unique. This is something we should all value and others should take on. **Dr. Babu Fathepure** also mentioned how few other labs are doing this across the nation but altering the study to their specific curiosities.