

LIFE AS A FORENSIC SCIENTIST

CALS alumna and student solve mysteries in science career

By Alaina Dismukes

THANKS TO TV SHOWS like *CSI: Crime Scene Investigation* and *Criminal Minds*, the study of forensic science has become more popularized in the last two decades.

The TV show *CSI* began in 2000 and quickly became a number one television series. Enjoying 15 seasons, the crime scene show began in Las Vegas and quickly branched out to Miami and New York, and even into the military with NCIS.

By shining a light on this profession and the use of scientific techniques and tools such as DNA sequencers and scanning electron microscopes, forensic science is now a growing field with several career options like forensic DNA analyst, computer forensic specialist, or trace analyst just to name a few.

While these shows opened the world of forensic science to many, they can also portray the profession a little more glamorously than the actual career.

According to forensic scientist and CALS alumna **ALISON DEBEAORD**, the field entails a lot more than what you see on TV.

"While the science depicted on those shows is usually sound, the process they portray is not what the vast majority of forensic analysts experience. It can be a rewarding job, but you are exposed to the worst that people are capable of and that is pretty challenging," she said.

DeBeaord, a 1999 biochemistry alumna, became intrigued by forensic science while working in a microbiology research lab after she graduated from MSU.

"A coworker always shared job openings

he had found in forensic science or interesting stories he had read in the news," DeBeaord said. "His constant flow of information about the field helped me realize that forensic science was a great way to use my scientific knowledge and lab skills to have a direct influence on the lives of others."

The Cherokee, Alabama native worked for the Alabama Department of Forensic Science (ADFS) for 13 years in the DNA databank unit. There she processed samples from convicted offenders and arrestees to input their DNA profiles into the National DNA Index System (NDIS).

"In 2015, I left ADFS and joined a large biotech company, Qiagen, as a forensic application scientist," she said. "I now travel to forensic labs—primarily in the Southeast—to assist with instrument implementation, process validation, and training staff on new methods."

Since DeBeaord is no longer in a fixed laboratory position, she said that every day is different, which is her favorite aspect of the position. Some days she works from home analyzing data, writing reports, or corresponding with labs to troubleshoot an issue they are having. Other days, she's in a forensic lab running samples for a validation project, so that the lab can implement a new instrument, assay, or chemistry into their workflow.

"I loved working at ADFS and processing samples in the lab on a daily basis, but I also love now being able to share my knowledge and experience with other forensic labs," she said enthusiastically. "And meanwhile, I'm still able to be in the

lab processing samples from time to time."

Another aspect of forensic science is the field of forensic entomology. Forensic entomologists use what they know about insects in order to help determine the rate of decomposition of a corpse.

Different insects can provide insight into how long a corpse has been decomposing. For instance, the black blow fly is one of the first insects to come onto the scene, so determining when the black blow fly arrived helps forensic entomologists determine time of death for a particular body. While it is well known how the black blow fly relates to the decomposition of a corpse, much less is known about the role fire ants play in the process. That's why **GRANT DE JONG**, MSU doctoral student in forensic entomology, is on the case to answer just this question.

"A general observation that people have made is that if there is a corpse in the Southeast, it's not long before fire ants will get on it," De Jong said.

This is a fairly recent phenomenon since these types of fire ants were not introduced to North America until about the 1930s or 1940s, but their presence on carrion was not reported until the 1980s. Now, they are considered a normal part of the fauna that gets on carrion.

"There have been theories on why they may be there but not any absolute answers, so part of my research is finding out why they are there in the first place," he said.

With this research, forensic pathologists and forensic entomologists will be able to better assess a corpse that has fire ants on it and understand whether





the fire ants may have accelerated or slowed down the decomposition rate by their activities.

De Jong is both student and teacher. He juggles coursework as both an MSU doctoral student and an instructor at Pensacola Christian College, where he teaches general biology, zoology, entomology, and parasitology, a branch of zoology that focuses on parasites.

He said that pursuing a Ph.D. has been a goal for a while, but he was in search of a program most aligned with his research interests.

"When I first started considering a Ph.D., I worked at GEI Consultants, Inc. in Colorado, working mainly in aquatic ecology," he said. "I wanted to eventually get a Ph.D., but at the time, it just wasn't feasible."

After working at that company for 22 years, he and his family moved to Pensacola, Florida, where he began teaching at PCC. That is when he renewed his search for a doctoral program. De Jong contacted Dr. Jeff Dean, professor and head of the Department of Biochemistry, Molecular

Biology, Plant Pathology and Entomology at MSU, who connected him with Dr. Jerome Goddard, an extension professor in entomology. Goddard believed De Jong could pursue the degree while still keeping his teaching position in Pensacola.

Goddard recognized that De Jong's research project would have a molecular biology component, so he reached out to Dr. Florencia Meyer, associate professor and molecular biologist in the department, about being De Jong's co-advisor.

"We developed a plan for me to be able to be a part of MSU's graduate program, but to still be able to live and work in Pensacola," said De Jong, who travels to Starkville once or twice a month.

He began his doctoral program in the spring of 2018, just a few months after his initial contact with the university.

"My interest in forensic entomology started back during my undergraduate days at Colorado State where I was getting a degree in bio-agricultural science with an entomology concentration. My major professor worked with forensic entomology to a small degree and working with him whetted my appetite for the subject," he said.

De Jong went on to earn a master's in entomology at the University of Nebraska, where his thesis was on forensic entomology. His earlier research in entomology inspired him in his current project on how fire ants are factored in when it comes to the decomposition rate of a corpse.

De Jong says the process of discovery drives him.

"Research has always been something I enjoyed doing," said De Jong. "To be able to participate in forensic entomology at MSU is exciting, and I'm looking forward to seeing where it takes me."



TOP: Alison DeBeord is a forensic application scientist for Qiagen. (Photo Submitted)

LEFT: Grant De Jong analyzes an insect sample at the Clay Lyle Entomology Complex at Mississippi State University. (Photo by David Ammon)