Emma Tkachuk

Emma Tkachuk is a human biology major and a writing minor at UC Merced. She is originally from Ukraine, and has lived in California since 2002 after immigrating to the United States. Her interest in health sciences has led her to focus on human biology, but after taking a few writing courses she developed an interest in writing and as a result she added a minor in writing. Her paper on Acute Pancreatitis was a way to combine health sciences and writing in a creative way. The idea for Acute Pancreatitis came from her fascination about the pancreas and this has lead to research the organ's anatomy, physiology and pathophysiology. After learning that Alexander the Great died of acute pancreatitis, she developed a story-line that brought the disease to life, where Acute is the first name of Alexander's murderer and Pancreatitis is the last name. In addition to independent research, Emma consulted her mentor and employer Romel E. Velastegui, MD on the current diagnostic methods for pancreatitis, and Dr. Velastegui edited Emma's first draft of the Mysterious Cases of Acute Pancreatitis for medical accuracy.

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Mysterious Cases of Acute Pancreatitis

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Abstract

Pancreatitis [pan-kree-uh-tahy-tis, pang-] is inflammation of the pancreas, a yellow gland located behind the stomach, where *pancreas*- refers to the organ itself and *–itis* means inflammation[2]. The pancreas is similar in its structure to the salivary glands, but it is softer and less compactly arranged. It is long like a dog's tongue where the tip of the tongue is the tail and the back of the tongue is the head. The portion between the head and the tail is called the body with a slight narrowing towards the tail referred to as the neck[3]. But unlike a dog, the pancreas does not have extremities nor is it covered with fur. In fact if it was a dog it would probably be diagnosed with alopecia. Though it does have many blood vessels, it isn't thought to be hairy and even though the pancreas has failed to make headlines in recent time, it plays a huge role in the human body. It is responsible for releasing hormones like insulin and glucagon as well as enzymes such as protease, amylase and pancreatic lipase that help with bolus (food) digestion[1]. The pancreas is well situated transversely across the posterior wall of the abdomen, behind the stomach and engulfing the abdominal aorta and inferior vena cava, and with any disturbance to its environment the pancreas prepares for a war that is often times fatal.

Acute Pancreatitis was one of the first, out of his family tree, to attack and successfully conquer a human body. On a joyful evening in Babylon, the king of Macedon, Alexander the Great sat on his throne marveling upon his possessions. He was well educated and had many friends. Often after a long day he would invite all of his friends into his home where they all drank well into the night. It wasn't on occasion. Alexander liked his wine and he had plenty of it. Life was great. But on that night, after everyone had fallen asleep Alexander was granted by a visit from Acute Pancreatitis. It wasn't the way Alexander wished to end the night. His abdomen began to swell; he began to feel weak in the presence of this monster, he felt chilled; sweating and nauseated. Alexander found the strength to crawl to the outside fountain and regurgitate all that was left in his stomach. He tried to cry out for a doctor, his mouth drying with every second, his body weight began to vanish as if in an instant. He knew now that this monster had won; conquered the great king, depriving him of all life.

Alexander wasn't the last of Acute's victims. Acute left Alexander at the fountain, trading him for a drink. He spent most of his time with people who were free spirited. Drinking and smoking; having a good time until his next strike. Even centuries later, people never saw it coming. They didn't realize what Acute was

capable of. Years past and after many more deaths, the authorities developed an interest in what seemed to be a perfectly executed crime. They began looking for patterns in some of the few victims they could identify but soon realized that this crime went unnoticed for many centuries. It become apparent that this was beyond what they could handle so they called for assistance from the pathology department.

In 1889 Reginald Huber Fitz, a pathologist at Massachusetts began his investigation[5]. He performed post-mortem exams and was able to see a connection between the mysterious victims. It appeared that every victim suffered from gastroduodenitis. He thought the assailant must have deprived its victims of fluids, raised their triglyceride levels, and injured their organs. But with what? Reginald could not find the weapon and without the weapon he did not have a case. He decided to call his long-time friend Eugene Lindsay Opie in Virginia. After going over Reginald's thorough reports, Eugene, also a pathologist, suggested that the weapon was gallstones. He explained that the assailant occluded the common bile duct using gallstones which prevented bile from entering the duodenum and leading to gastroduodenitis. Reginald though that this was a good start and it gave him a suspect: the duodenum. He called the police department and requested that Mr. Duodenum was brought in for questioning. But unfortunately for Reginald Mr. Duodenum had an alibi and while in custody Reginald was notified that there was yet another victim. He was back to square one.

Reginald shifted his attention to the abnormal triglyceride levels in every victim. He thought that maybe gallstones did not occlude the bile duct but rather the pancreatic duct. He requested that Mr. Pancreas was called in for questioning. Similarly to Mr. Duodenum, Mr. Pancreas had an alibi but something about him troubled Reginald. Although Mr. Pancreas did not seem to be the assailant, it appeared that someone similar to Mr. Pancreas was, someone with similar qualities. Reginald wanted to learn more about Mr. Pancreas, his thinking, his lifestyle and perhaps it would bring Reginald closer to the killer. So he requested a search warrant to inspect Mr. Pancreas's home. To Reginald's surprise, Mr. Pancreas was offering his home to his cousin Acute Pancreatitis who was staying in town for a few weeks. Mr. Pancreas did not mention this to the authorities and Reginald wondered why he did not ask Mr. Pancreatitis to confirm his alibi.

With a few ideas in his mind, Reginald hurried back to his laboratory. Since Mr. Pancreatitis was related to Mr. Pancreas and appeared nowhere to be found, Reginald thought that perhaps Mr. Pancreatitis would

give him some answers. He asked the authorities to bring Mr. Pancreatitis for questioning. As the police department searched for him Reginald noticed that along with elevated levels of triglyceride all of the victims showed an extremely high level of lipase. How could he have missed this? Now he understood how the victims died. An elevated level of lipase must have caused the victims a sudden onset of excruciating abdominal pain followed by nausea and finally a fever. They had a short death, but in agony.

When Acute arrived at the police department, covered in white slime, he asked for a clean change of clothing. He claimed that he was working on paste in a local factory. Reginald explained to him that it was standard procedure that persons in custody who ask for services must undergo a CT scan with IV and PO contrast for safety purposes. Acute had no choice now. He thought that if he decided to run home the investigators would grow suspicious of him. He allowed them to do the CT. Then in the questioning room Reginald asked Mr. Pancreatitis where he was a few nights ago. Acute felt trapped. He felt his face turn red and he began to swell. He asked for a cup of cold water, and a lawyer. After talking to Mr. Pancreatitis, Reginald knew he had the killer but he couldn't prove it. Something was not aligning correctly, and he couldn't figure out what it was. Mr. Pancreatitis could not confirm where he was on every night of each of the victim's deaths. This seemed more than a coincidence.

Reginald examined Acute's CT scans and saw that Acute was inflamed which indicated that he was hiding a crime. This was enough evidence to take the case to court and present it to the judge, but that was not enough, he lacked sufficient evidence to prove that Acute was guilty. Reginald was stumped. For weeks, he went back and forth in the laboratory, examining the victims, hoping that he would find more clues. Acute Pancreatitis had killed many innocent people and Reginald could not bear the thought that Acute would only serve a brief sentence due to the lack of evidence. Then, one night when Reginald was taking a walk on a cool evening, the thought came to him. The paste. The white slime. He should have thought of this before. Reginald rushed back to the laboratory and analyzed the substance on Acute's clothing the day of his first questioning. The test came back positive. Reginald jumped with joy.

On the next day in court Reginald presented his evidence to the judge. He explained that the CT scan showed that Acute Pancreatitis was inflamed and although this was not enough evidence to convict him,

Acute Pancreatitis left a trace of lipase on every victim. He explained to the court that only Acute Pancreatitis could have ownership to lipase and he was covered in it the day the authorities brought him in for questioning. And what was more, Acute Pancreatitis deliberately suffocated the victim's pancreatic tissue which not only lead to severe discomfort but ultimately death. Reginald was overjoyed. He knew that at that moment he won the case. By proving to the court that Mr. Pancreatitis caused his victims necrotizing pancreatitis, Acute would be charged with first degree murder. Reginald no longer had to caution people from consuming alcohol to protect them from the hideous monster who lurked among them. Acute Pancreatitis was convicted, sentenced for surgery.

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