

**Bio excerpt
by Lithe Basbous**

Mathematics can allow pioneers to predict relationships amongst seemingly unrelated variables. There is a vast amount of information that can be concluded from the meta-analysis of academic research and reviewal of health data in the medical field. It can involve whole genome studies or even a parallel analysis of health records within a population. Moreover, math enhances our understanding of our biology, analogous to understanding individual personalities and their holistic impact on themselves and on others. Health data encompasses a never-ending network of correlations that could aid us in understanding diseases' blueprint.

The experience I have accumulated as a medical chart retrieval specialist at CIOX, a healthcare information management company, leads me to believe in the necessity of a more enhanced study of medical information in research. The twenty-first century saw an increase of reliance on electronic medical record softwares amongst clinics and hospitals of various capabilities. During my employment at CIOX, I gained experience in using EMR software like Epic and eClinicalWorks. It outlined the efficacy of electronic documentation of health information and the potential of networking medical variables. Data contained within medical records, once interpreted ethically and legally can enhance the development of drugs, procedures and assist in the prevention of diseases. This data wouldn't necessarily be useful unless we establish valid network of correlations amongst variables in a data pool. Biostatisticians can mathematically determine dependent and independent variables. Moreover, an in-depth assessment of factors from all aspects of academia is crucial for research regardless of the topic of interest. Geographical studies, the US census and numerous scholarly works should be considered in a meta-analysis to signal out links and discover a network of potential causes and effects for diseases.

In December of 2021 I joined the National Prion Disease Surveillance Center at Case Western Reserve as a research assistant. My job encompasses a wide range of lab work, ranging from rudimentary lab activity to using DNA sequencing machinery. Through this practice, I noticed the need for genomic studies to correctly diagnose diseases. Creutzfeldt -Jacob Disease, a neurodegenerative disease, is classified according to the form of mutation the individual has developed. Diagnosis wouldn't be necessarily accurate unless the individual's PRNP gene has been sequenced. For example, Variant, Sporadic and Iatrogenic CJDs' genetic backgrounds are not shared. The genetic factor in diagnosis can shed light on other disease-causing variables like meat contaminants, mutagens and what seemingly is spontaneous genetic activity. Permutations, Combinations, and graph models can describe mutant genetic domain and relationships between mutations. In addition to running Polymerase Chain Reactions, gel loading and extraction, I am able to review sequencing information and plan restriction enzyme reactions, primer attachments and some other activities using SnapGene viewer. I also have developed more intricate skills using excel. From organizing purchase order history sheets to the development of an active excel sheet that automatically informs me of the need to resupply whenever reaction unit frequency has been logged on.

I graduated undergrad last year with a summa cum laude at Cleveland State University. I majored in biology, following a pre-med track. Throughout my undergraduate career I assisted in tutoring and instructing students in physics and mathematics. Additionally, I led a small study under the supervision of my chemistry professor, Dr. Anne O'Connor, exploring the presence of carcinogenic molecules within smoked meat products using gas chromatography. During my sophomore year, I volunteered at Cleveland Clinic's cardiology department. I provided non-clinical assistance for patients, aiming to enhance their stay. Additionally, I shadowed an orthopedic surgeon in Dubai during my summer breaks of undergrad. This leads me to believe that my clinical exposure enhances my methods of approach to research and surveillance in the medical field.

The onset of disease is a result of complex relationships amongst biomolecules in a varying biological system. The timeline of those reactions can be prenatal or even during the individual's lifespan. Hypothetically, the number of variables that could be considered during scientific studies are endless. However, with solid data collection and strong mathematical models, the backbone of a relationship network can be uncovered.