

The importance of cyberbiosecurity law and policy for the protection of DNA and forensic evidence

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ABSTRACT

The application of science to criminal and civil laws is known as forensic science whereby investigations are guided by legal criteria of acceptable evidence. Since DNA profiles are part of forensic identification such as genetic fingerprints, forensic scientists may use them to identify criminals or determine parentage. Apart from forensic purposes, modern biotechnological approaches manipulate genetic material and cell fusion beyond conventional breeding barriers. Scientists were able to insert foreign DNA into another host and even track the transfer of foreign DNA into the following generation using this technological development. These DNA data are then stored on the computer, online, or cloud platform. Unfortunately, the use of DNA technology and genetic modification could pose some potential threats to the lab data, both physically and electronically, or remote hacking, unfortunately through dual purposes of research and development. This is one of the cyberbiosecurity challenges that could compromise the legitimacy and reliability of forensic evidence presented in court later. Since cyberbiosecurity is a relatively new discipline, this study utilises doctrinal legal research to develop a conceptual model. Alternatively, apart from forensic or evidential purposes, any unauthorised DNA alteration of humans, animals, or plants could have a wider devastative impact on human life and the environment.

While forensic science is one of the most essential developments in supplementing or providing evidence in criminal and civil litigation cases, knowing potential cyberbiosecurity concerns, such as manipulation of DNA storage of information is critical. To protect DNA or related biobank data, cyberbiosecurity regulations and policies are required. By having a clearer policy, standard operating procedures, risk assessment and management, rules and regulations, and other safeguards in place, these key areas will be protected. A strong cyberbiosecurity law and policy could protect biobank data, also cyberbiosecurity aspects, submitted to forensic scientists in court, as they would be unable to be questioned about its legitimacy, trustworthiness, or validity. Thus, lab and forensic scientists, as well as regulators, legal practitioners, and enforcers, must have an adequate understanding and awareness of these interwoven legal and ethical problems of cyber, ethics, bioethics, biosecurity, and forensic evidence, ultimately known as cyberbiosecurity laws.

Keywords: cyberbiosecurity law, policy, bioethics, forensic, biosecurity, DNA

INTRODUCTION

Forensic science has been long in practice from the very simple set up of forensic investigation at the police station, or the police lab, or further at Chemistry Department that supplements forensic evidence or to a more modern and sophisticated futuristic lab as portrayed in the famous Hollywood drama series of Crime Scene Investigation (CSI), perhaps that lab depicted the current settings of FBI or forensic lab in the United States and other developed countries. Apart from their routine lab work, these forensic labs provide the crucial scientific evidence needed in civil and criminal court cases either to prove the perpetrator and associates of the crime, in civil matters such as parentage for adultery cases for instance, and many others. Forensic science arguably a science has proven through lab scientific prove through its reliable and valid mechanisms of testing and proving, is not free from various issues of controversy. However, it is not the intention of the scope of this article to discuss the argument from the forensic science labs evidence but rather more on one crucial aspect of cybersecurity-related to the forensic labs namely the cyberbiosecurity aspects, arguably a future or existing threats on the physical and cyber aspects of the computer aspects of the lab.