**The Development of Blockchain Based Cross-site Genomic Data Access Logs**

Nowadays, most of genomic data repositories have their own logging system. It is difficult to audit the cross-site data access behaviors without a global logging system. On the other hand, centralized architecture presents security and robustness vulnerabilities such as single-point-of-failure. To address these issues, our research focused on developing a cross-site genomic data access logs using blockchain technology. Genomic data repositories can join the blockchain network and store their genomic data access logs into the blockchain, also, they can search the blockchain to get the cross-site logs. In this study, we use MultiChain as our platform to set the private blockchain network through servers. We constructed a time/space efficient algorithm to store/query genomic data access logs and test the algorithm on a 4-node blockchain network. Comparing to the traditional centralized logging system, blockchain allows genomic data repositories to share their user access logs without the threat of single-point-of-failure while preserving the privacy and security.