Programming an Online Collaborative DNA Analysis Program (OCDAP)

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Researchers utilize many tools to study and manipulate DNA. One method uses restriction enzymes, which are proteins that cut DNA at specific sequences. This process is vital for DNA cloning and mass-producing products such as insulin. Due to the size of DNA and vast array of restriction enzymes, identifying a specific cut site by hand is time-consuming and subject to human error. Applications exist for this purpose, but their user interface can be improved. Some programs provide poor visualization of results; others must be downloaded, impeding updates and collaborative improvements. An online, collaborative DNA analysis program would provide quick, efficient searches that are presented visually, be more user-accessible, and allow for widespread collaboration. HTML5, JavaScript, and PHP were used to create a webpage capable of the following: pulling an organism’s DNA sequence from an online biological database; locating all instances where the selected restriction enzyme can cut along the DNA sequence; and visually displaying cut location and appearance. Upon completion, Dr. Andrus and his students will be asked to evaluate the tool using classroom and research applications. The project will be available to the community through GitHub so it can be improved upon under the guidance of an assigned administrator.