Brimer: A Web System for Managing Primers

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BRIMER - Primer Library Online is a web software implemented for better management of the oligonucelotide library of the Biomolecular Technology Laboratory (LTB) researchers from Federal University of Pará. Primers are small single stranded DNA chain, which binds to a specific region of the target, wherein the DNA polymerase will begin incorporation of nucleotides forming the double-stranded DNA. This work aimed to develop a web system for primers catalog management with user access for LTB personnel. There already exists some oligonucleotide management software available in the literature; PIPEMicroDB is the more similar with the same programming language (PHP), online relational database and the same database management system (MySQL). However, the PIPEMicroDB is a microsatellite database and primer generation tool for pigeonpea genome; Brimmer, on the other way, can be used to build an organized catalog of primer sequences of any organism. This database would generate a library of primers with all relevant information for better managements as: (i) related scientific communications/description; (ii) synthesis costs; (iii) target genes and organisms; (iv) any other useful information. The Brimer system is hosted initially in http://ltb.ufpa.br/brimer, which features presents in its initial page, user login and password. After accessing the system, the user authentication is validated and Brimer verify its access level and profile. A Primer query screen can be seen by all profiles and offers three options of search filter: "Oligo", "Organism" and "Gene". If necessary, the system also exhibits other registered primers in the database that present the same melting temperature for optimizing thermocyclers usage. Additionally, the system offers the functionality of linking PDF files of bibliographic items related to each primer. The Brimer system was implemented and tested on Windows, Linux and Mac OS; Chrome and Mozilla Firefox web browsers. This work applied the Kanban's agile methodology development techniques to implement a prototype for testing and validation of the system. We used a qualitative methodology involving documentary and bibliographic research, field assessment at the LTB group to evaluate the system requirements through interviews and checklists. Brimer was tested by LTB personnel and the user evaluation was measured by questionnaires applied individually. The survey results indicate a good acceptance and satisfaction from users who are using the system, with the better evaluated feature being the system ease of use. Researchers also pointed that Brimer is very important to optimize the organization and utilization of the oligonucleotide currently used at the laboratory.