Redesign and development of electronic elements of a thermal cycler for DNA replication prototype

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Among common activities of Equi-LaB (Equipment Development Group for Biological Laboratories) and INACOM PUCP CIMNE Classroom: Research assisted by computer), faculty of Electronics and Mechanical Engineering Department have been working PUCP the design and implementation a prototype thermal cycler. This equipment allows a segment of DNA replication, automatically, following the reaction process polymerase chain which is very useful in all laboratories in the life sciences which uses the latest techniques modern biotechnology.

The prototype presented cycler incorporates thermo-mechanical electronic and obtained as a result of the research team. A electronic level have been developed for process control systems and power for the operation and use of Peltier cells, and have implemented the sensor, actuator, the software for temperature control, and testing circuit performance.

On the other hand, thermo-mechanical components developed are: sample holder tray, Peltier cells, heatsink, fan, housing and cover, the same that have been designed, tested and corrected by using the finite element method, by analyzing fluid mechanics and heat transfer through computer simulation.

The final implementation of the prototype is aimed to integrate the achievements of thermo-mechanical elements and electronics.