

## **Biochemistry and Molecular Biology education. Learning problems and proposed solutions**

**Mohammed Baaziz**

Laboratory of Biochemistry and Plant Biotechnology, Cadi Ayyad University, Faculty of Sciences – Semlalia, P.O.Box 2390, 40000 Marrakech, Morocco.  
E-mail: [baaziz@ucam.ac.ma](mailto:baaziz@ucam.ac.ma)

### **Abstract**

Biochemistry and Molecular Biology education is faced the lack of ideal methods for learning because of the difficulties to assure experimental approach without it the description of numerous experiments becomes heavy and time consuming. Only the laboratory could be the most formative tool. The book cannot be indeed experimental. Generally, valuable learning of biochemistry and molecular biology is linked to the existence of a well developed local scientific research. In addition, adapted methods of biochemistry education become necessary. The establishment of a modern biochemistry education depends on many elements, such as 1) acquisition of concepts for viewing molecular structures in the space, which allows the understanding of the real structure of molecules and the definition of their anatomy, 2) Use of appropriate tools for representing reaction mechanisms, since metabolism in living cells is being described on a more and more detailed level. For example, the presentation of the mechanisms of enzyme catalysis remains difficult to accomplish because it often involves several successive steps. Their fragmentation in many parts on a blackboard or a paper, does not allow enough knowledge on the phenomenon dynamics. Creating animations with atoms in displacement and being exchanged in uninterrupted fluxes, is of great help in understanding biochemistry reactions, and 3) involvement of Biochemistry in the total understanding of the live functioning. Distinctions between biochemistry, molecular biology, biophysics, histology and other disciplines, are artificial partitioning.

In all cases, the computer-based learning becomes necessary to achieve all steps of biochemistry and molecular biology education. In addition, most textbooks will be web-based and courses will be in the format of long-distance learning; laboratories may become 'virtual'. The tendency towards using the computer-based learning Biochemistry and molecular biology will be more accentuated since these disciplines will continue to be driven by genomics, proteomics, bioinformatics, and pharmacogenetics.

**Keywords:** biochemistry, molecular biology, education, computer-based learning