Editorial

Graphical Representations of Biological Sequences

This thematic issue, “Graphical Representations of Biological Sequences,” is devoted to the topic of similarity/dissimilarity of biological sequences (DNA, RNA, and protein). A pioneering role was played by one of us (AN), among other efforts [1–4], in performing a ground-breaking task of graphical representation of DNA sequences in a 2D grid in 1994 [3]. Subsequently, in 1999, this was further developed in the University of Minnesota in Duluth under the aegis of Prof. Subhash C. Basak [5], and the field exploded into a burst of creativity in which the editors of this thematic issue [3,6–9], Chinese [10,11] and European [12,13] researchers, to mention a few, contributed significantly.

A new branch of bioinformatics has been guided by the new graphical analyses developed rapidly over the last two decades [reviews 14–17] and belonged to the most promising directions of the evolution of this area of science. Methods referred to as graphical representations of biological sequences are aimed at both graphical and numerical comparisons of the sequences [18–20]. Some of the research carried out by the editors of the current issue and their collaborators have contributed significantly to understanding the effect of viruses, especially pandemic viruses like Zika and COVID-19, in human lives. Important developments in this field comprise characterization [21,22] and clustering of new viruses [23], their spread and mutational changes [24], analysis of similarity/dissimilarity and discrimination between different viruses [25, 26] and rational design of peptide vaccines [27, 28].

The submitted articles contain descriptions of algorithms of the creation of graphical representations of the sequences and discuss the significance of the numerical quantities characterizing the diagrams as well as applications of such methods in the design of peptide vaccines for emerging global pathogens and their surveillance using alignment-free sequence descriptors [29]. Papers dealing with different ways of the visual and numerical comparisons of the considered objects and discussing a variety of applications of the graphical methods are presented in this thematic issue.

We, the Guest-Editors, are grateful to all the authors who contributed to this special thematic issue.

REFERENCES


---

**Dorota Bielinska-Wąż**  
*Guest Editor*  
Medical University of Gdańsk  
80-210 Gdańsk, Poland  
E-mail: djwaz@gumed.edu.pl

**Piotr Wąż**  
*Guest Editor*  
Medical University of Gdańsk  
80-210 Gdańsk, Poland  
E-mail: phwaz@gumed.edu.pl

**Ashesh Nandy**  
*Guest Editor*  
Centre for Interdisciplinary Research and Education  
Kolkata 700068, India  
E-mail: anandy43@yahoo.com