""Biology Systems in STEM open education for teacher training"

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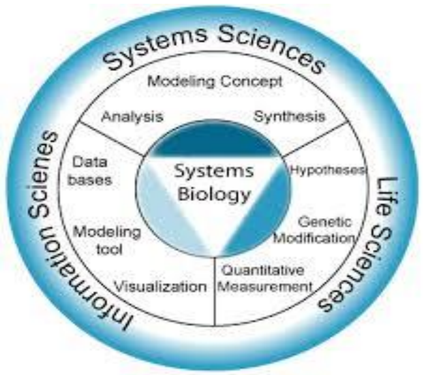
ABSTRACT

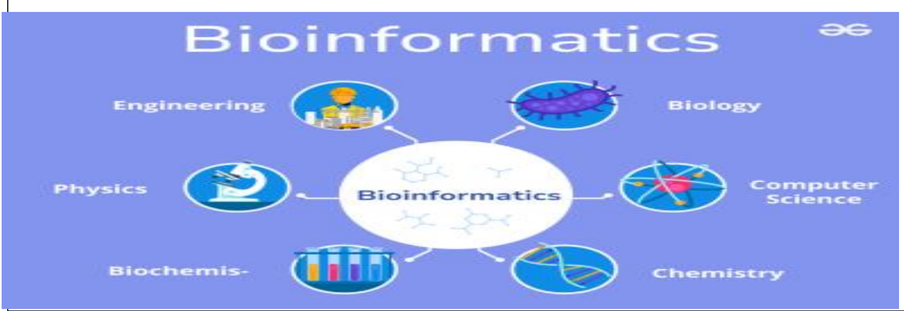
The fundamental purpose of this project was to design and implement a creative, reasoned operational innovation in high school teacher training. Motivate and re-motivate teachers in their being masters of culture by creating modern seminars and innovative interactive and participatory STEM teaching laboratories, proposing the culture of teaching biosciences with a systemic approach that identifies in the integrated learning of different disciplines and in Systems Biology
an opportunity to cultivate transversal skills that will be increasingl or future generations to study complex problems.



Fundamental to participate a the plan of science education training offer not just as performeers of pre estabiliahed and standardized tasks, but as people with high passion and skills for communication and STEM didactic researches.

METHODS

Theoretical and operational elements of bioinformatics into participatory STEM Teaching laboratories
Bioinformaics helps to build a common language between biologists and computer scientists with a high procedural multidisciplinary didactics.
BioTests for students with AI and discussions

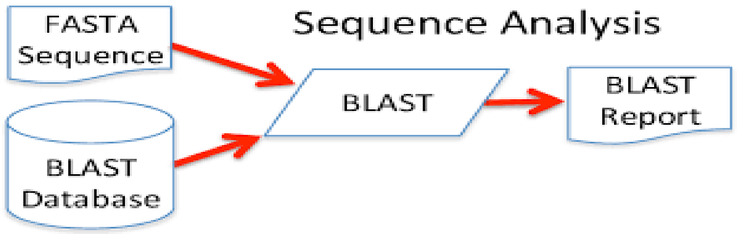


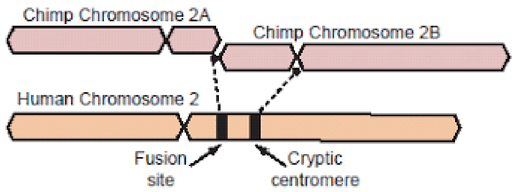
RESULTS

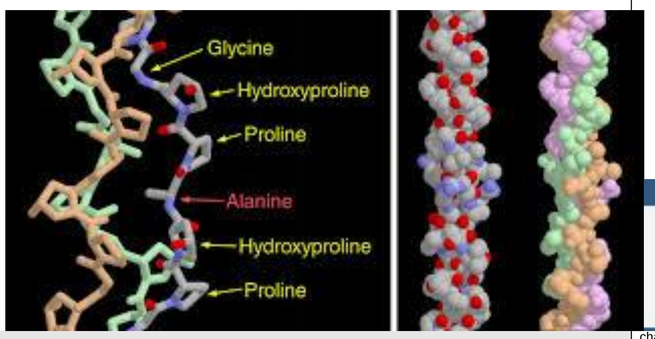
The teachers working in pairs connected in PDB home page to search some information about three protiens : Hemoglobin, Collagen, Na-K pump, insulin, adrenaline receptors, immunoglobulin; NBCI human gene hemoglobin and myoglobin

The teachers observed the conformation of the chosen proteins describing secondary, tertiary, quaternary structure

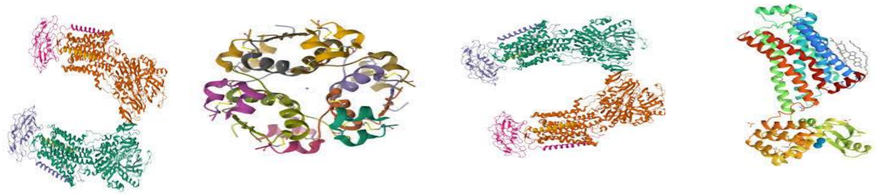
The teachers presented the results obtained with written paper about the perspectives of application of the work done discussed the projected didactic itinerary and interconnections between different disciplines





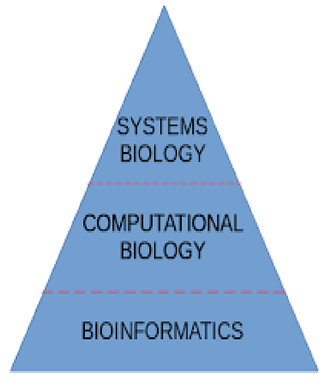


"STEM Bioinformatics Training"



DISCUSSION AND CONCLUSION

Bioinformatics provides researchers with predictive working methods on the biological functioning of living things and prescriptive strategies that can impose a certain behavior on the biological systems, opening up a new integrated approach to investigation called "Systems Biology", a dynamic model in the study of the behavior of biological systems that evaluates the biochemical, physiological and genetic interactions between the different parts of the systems.



A cultural approach on the possible education implication of the teaching activities in terms of methodological innovation

SYSTEMS BIOLOGY EDUCATION

challenges
[2]also for recruitment and retention", International ATEE Conference Acts, Bergamo University, EU 6/2024
[2] Tammy M. Long et al, " Systems thinking in Biology Teaching and Learning", STEM Education, Vol. 9, USA 03 2024
[3] Marina B.A. Minoli, "Systems Biosciencer Education in High School", New Secondary School, pp 78 - 81, Studium Editor, Rome EU, 09/2018
[3]AM Getahum, A. Molla, " A comparative analysis of istructor's competencies in teaching 21st skills in between natural
[4]science streams of study", Higher Education Skills and work based Learning, 12/2024
[5] Robert M. Klassen et al. "Attracting prospectives STEM teachers using realistic job previews: methods study",European Journal of Teacher Education, Vol. 46, pp 533-555, UK, 05 2021
[5]Howard Scott, Matthew Smith, "Innovation from necessity: digital technologies, teacher reciprocity and with
[6]organisational innovation", Open Learning: the journal of open distance e-learning, pp 170-187, UK, 01 2024