Twelve years of BIOinformatics CLUb for Experimenting Scientists (Bioclues)

Partha Sarathi Das, Rajdeep Poddar, Saumyadip Sarkar, Mohan Kumar Megha, Vijayaraghava Seshadri Sundararajan, Sivaramaiah Nallapeta, Pratap VV Reddy, Jayaraman Valadi, Tiratharaj singh, Pritish Varadwaj, and Prashanth Suravajhala

Bioclues.org, India

Correspondence: prash@bisr.res.in or prash@bioclues.org

Abstract

We describe the scientific community of an India effort, the Bioinfomatics Club for Experimenting Scientists (Bioclues) whose aim works on four avenues, viz. Mentoring, Outreach, Research and Entrepreneurship (MORE). Incepted in the year 2005, the organization went on to become an affiliate of International Society for Computational Biology (ISCB) in 2011. Ably supported by Asia pacific Bioinformatics Network (APBioNet), we are one of the fastest growing bioinformatics societies in India, currently serving over 3400 members from nearly 30 countries. Bioclues adheres Creative Commons License with the prime focus to help the bioinformaticists in India to promote open access. In the year 2010, when we setup vision 2020, we aimed to bring together the Indian bioinformaticians, foster a strong working mentor-mentee relationship, provide access to bioinformatics resources, organize conferences and workshops besides imparting information about research, training, education, employment and current events and news from bioinformatics, genomics, and related fields. In this article, we describe the challenges across the four avenues and further highlight the opportunities the organization has met the last decade in understanding the core necessity of computational biology virtual projects driven by these avenues viz. MORE.

Keywords: Professional societies, mentoring, research, bioinformatics, scientific organization

Introduction

Bioinformatics has burgeoned ever since the central dogma of bioinformatics, in the form of 'sequence predicts structure predicts function' has been a well-known method. Like any other country, the first bioinformaticists in India were none other than the computational chemists who were interested in molecular modeling or cell biologists who tried to predict the function of proteins. India has seen a surge in bioinformatics taught programs at both undergraduate and graduate level. Both engineering and science students absorbed the subjects with pride and a speck of curiosity. That has led to increase in several fora and discussion boards in the internet. Mentoring the students to take up bioinformatics as a subject and cater to their interests was felt important when there was a surge in student community showing interest in research. This has resulted in a need for a scientific society. A few societies from India in early 2000s were established albeit with different purposes. There was no specific focus on mentoring or guiding the student community. We identified the need of four avenues, *viz.* Mentoring, Outreach, Research and Entrepreneurship (M-O-R-E) and started the Bioinformatics Club for Experimenting Scientists (Bioclues) in 2005. While working virtually helping the student brethren, we faced challenges in organizing the societal needs especially towards the four avenues. We believe in putting them forward, the societies can overcome certain pitfalls and solve the challenges in a solicited way. While this article is aimed at overcoming the challenges we faced, these are not geographically restricted and could apply to any professional society working for such causes.

Passing the quorum: We the executive team ensured we would face the unmet challenges. The meeting was held at least a month onsite or virtually and ensure quorum was passed on the agenda points raised in the meeting. The most common discussions included the mentoring problems, general management of the organization, implementation of suggestions from the members and review of the current activities, planning and execution of the forthcoming activities, addressing complaints, delegation of duties to regional representatives, overseeing finances and auditing and event organizations. The minutes of the meeting were recorded for later use and confirmation

of resolutions in the next meeting was followed up. More than half of the executive members if present for the meeting, we deemed that the quorum was passed.

Challenges on mentoring: With bioinformatics burgeoning, mentoring the graduates interested in this field has been quite a challenge. For example, the India centric thoughts always prevailed. The questions range from what would be the scope of bioinformatics after graduation, job prospects and options for a career in research. Thanks to innumerable mentors who guided the students and pointed the need for focal themes for research. Many minute discussions have blossomed into a full-fledged research articles later which we put up in the publication pages (http://bioclues.org/publications/). The challenge here was also to overcome the barrier of visualization, forming a team and collaboration with the people who never met physically; the mentor only communicating to the mentee through telephony or electronic media. Bringing up a discipline of regularity in this remotely guided approach to meet the deadlines was also considered a task wherein the mentors would provide clues for the sort of challenges for the mentees/proteges.

Introducing entrepreneurial ideas to mentees: Learning with an insight to its application was felt the need of the hour wherein theoretical knowledge only would be seldom beneficial. With every learning aspect, we realized that we needed to understand the application front of the domain. We have had a cohort of young researchers and industrial experts from different corners of the society. Our focus was basically on the application of bioinformatics and computational biology. We further enriched the ideas raised by mentees and asked them to think out of the box. It is this idea which aimed to serve as a platform and introduced entrepreneurial skills amongst the aspirants providing connections through networking peers. In many cases, a prospective mentee is connected to an industrial expert or an academician based on the former's areas of interest. A turnaround time was then anticipated from either party to mould the ideas into an invention or a success story. Challenges are many when it comes to entrepreneurship amongst students. The mentees deliberated the need of failures and accepted the same. With entrepreneurship, first thing would be the financial

and monetary aspect. An important role with wide global reach was to help the mentee present the ideas, convert them into thought, debate and action. Before presenting an idea, they needed to assess the market needs. Here again the networks would be playing a pivotal role in facilitating the same. With these ideas in place, it is appropriate that working as a catalyst in bridging the gap between the real-time professionals and academics is the need of the hour.

Reaching the unreached Having online contests and quizzes was felt beneficial and motivating for the students. Approaching bioinformatics and networking thought process should bean integral part in Bioclues. *Reaching the unreached* describes the motivation towards thought process into action which in turn help nurture the learners. Researchers in the fields of bioinformatics from different countries united in this podium to form a knowledge sharing database to meet the essential requirements to refuel science with newer inventions. For example, when we launched BioLite in the year 2016 to encourage Ph.D.'s, Post Docs and early career researchers to present their research in just 5 minutes in the form of an elevator pitch, the kind of interaction with scientific community allowed researchers to enhance skills. Distinguished scientists attended the event providing the tips on how to hone the technical skills. While such events served a great deal from the participants to conduct more such kind of events, the forum has been organizing the virtual events. Another stepping stone for the society was when we launched the Bioclues Innovation Research and Development (BIRD) awards to recognize the works of young scientists to motivate them for novel advancements in the field of science. They receiving the award was an inspiration to many young students. Thus, a new breed of mentors stimulated the Bioclues cause.

Conclusions

There are growing number of professional societies in every niche areas and so is the case for biologists or bioinformaticists in various countries. It is certainly a challenge for the executive team members to bring a dialogue by the participation of societal members. The last 12 years, we have been trying to shone this success and convert

the failures to actionable elements. We quote Elizabeth Gilbert's “No experience in this world has ever been cathartic without the willing participation of the individual. Life does not automatically bestow wisdom or growth upon anyone just for showing up.”

Author contributions: PS wrote the initial draft. PSD, RP, SS, VKJ, VSS, TRS and MKM have written the first draft followed by others who chipped in with lateral drafts. PS, TRS and JV proofread the manuscript. All authors read the manuscript before submission.

Acknowledgements: The authors thank the current and past core members, Advisers and Bioclues Executive Team (BET) for their consistent support all through.