ILRI-BecA , EMBnet specialist node: progress report

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Scientific achievements

The mission of ILRI-BecA node is to provide widely used bioinformatics tools, databases and data storage to the east and central African research community through a central Bioinformatics platform. For that reason we tested the feasibility of the created bioinformatics solutions with the following "test cases":

1. application of genomics and immunoinformatics to identification of genes related to virulence in *Mycoplasma mycoides* the causative agent of contagious bovine pleuropneumonia (CBPP);
2. application of genomics and proteomics to camel *Streptococcus agalactiae*: development of vaccines and diagnostics to support camel milk marketing through improved control of mastitis.

Work on both "test cases" is still ongoing but several preliminary results demonstrate that the work have strengthened the research capacity of the involved scientists and academic institutions exploiting the bioinformatics resources deployed and created at the node.

Software developed

eBioUSB: during the Introduction to Bioinformatics course in 2007 students used a Bioinformatics Live-CD with a large number of bioinformatics software, it was however not possible for them to easily save their work. In 2008 we developed a "Bioinformatics workbench on a USB memory stick", eBioUSB [1] in collaboration with the Sweden EMBnet node, which contains all the basic bioinformatics tools, taught during the course and enabled students to save their data on the same device.

eBioMacKit: the Swedish EMBnet node developed the eBioMacKit to serve as a portable bioinformatics workbench or a local area server for a mid-sized laboratory. The solution is based on external portable harddrives that contain all the databases. This enables one to update large databases by exchanging them for new disks with new data, circumventing the poor Internet bandwidth issues in East and Central Africa. The BecA nodes in East and Central Africa will use this server solution to serve as a general bioinformatics platform [2].

Figure 1. Etienne de Villiers lecturing.

Capacity building

The ILRI-BecA node hosted several introductory Bioinformatics courses. In May 2008 we presented a 9-day course "Introductory course in Bioinformatics" [3]. The course team consisted of four persons, Erik Lagercrantz, Maria Wilbe, Erik Bongcam-Rudloff, Alvaro Martinez Barrio, from Swedish University of Agricultural Sciences (SLU), Uppsala University (UU) and Linnaeus Centre for Bioinformatics (LCB) and two persons, Etienne de Villiers and Saidimu Apale, from the ILRI-BecA node. We received 74 applicants from eight Eastern and Central African countries. We could only accommodate 24 applicants that were selected from Uganda, Sudan, Tanzania, Burundi, Somalia, Cameroon, Ethiopia and Kenya. Four travel fellowships were awarded to participants from Sudan, Tanzania, Cameroon and Ethiopia. The lectures were recorded on video and subsequently used at the University of Buea, Cameroon and Maseno University in Kenya. Students re-

Figure 2. ILRI staff and visitors.

ceived an eBioUSB to take back home to continue with their work. The course was very well received.

A second 'Introductory course in Bioinformatics' was held in May 2009 at the ILRI-BecA node. The course team consisted of, Etienne de Villiers (ILRI-BecA), Erik Bongcam-Rudloff, Hans-Henrik Fuxelius and Katharina Truve from the Swedish University of Agricultural Sciences (SLU), Uppsala University (UU) and Linnaeus Centre for Bioinformatics (LCB) and George Githinji (KEMRI-Wellcome Trust program). In total 25 applicants from Kenya, Tanzania, Uganda and South Africa were selected from 152 applications. Eight travel fellowships were awarded to participants from Tanzania and Uganda. An Internet video conferencing system was used to enable 22 students from University of Khartoum, Faculty of Animal Production in Sudan to participate. A former student from the 2008 course, Dr. Abdelaziz Ahmed Fadlelmoula, facilitated this action. The response from the University of Khartoum and Sudanese higher education authorities was positive and they have shown interest to host the next course in Sudan. Each of the students received an eBioUSB.

Students from a course we presented in 2006, established a Regional Student Group (RSG) affiliated with The International Society for Computational Biology (ISCB) in 2007. The goal of the RSG's is to conduct events, which will be beneficial to the professional development of Bioinformatics and Computational Biology students on a local level.

RSG East-Africa was very active in promoting Bioinformatics in the region and organized a one-day Bioruby/Bioperl workshop in May 2008 hosted and funded by the ILRI-BecA node. A total of 20 participants participated in the workshop facilitated by George Githinji.

In July 2008, RSG East-Africa organized a two-day introductory course using R and Bioconductor with help from the ILRI-BecA node.

The RSG East-Africa group invited Prof. Anna Tramontano from the Department of Biochemical Sciences, University of Rome "La Sapienza", Rome, Italy, for a 3-day Introductory course in Proteomics in November 2008. The node helped with logistics, providing accommodation for Prof. Tramontano and awarded two travel fellowships to enable students from Uganda and Tanzania to attend the course.

The RSG East-Africa was actively involved in organizing the first "African Virtual Conference on Bioinformatics 2009 hosted by the ILRI-BecA node in February 2009 [4].

Publications

1. New tools for bioinformatics teaching. Wilbe M. and Bongcam-Rudloff, E., EMBnet.news, 14.2: 3-4.
2. eBioMacKit: a bioinformatics portable teaching kit. Alvaro Martinez Barrio and Erik Bongcam-Rudloff, EMBnet.news 13.4: 6-10.
3. Nairobi, Kenya course report. Bongcam-Rudloff E., de Villiers EP., EMBnet.news, 13.1: 3-4.
4. AFBIX09: bioinformatics virtual conference. Nelson Ndegwa, EMBnet.news, 15.1: 16-17.

Figure 3. The ILRI Facilities in Nairobi, Kenya.