



Foreword

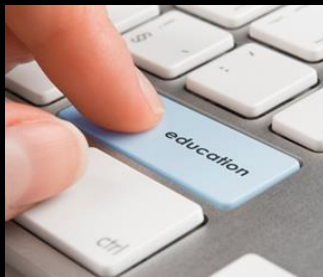


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The last H3ABioNet newsletter focussed on presenting the website, and now we are back to reporting on our activities. In June we ran a successful Data Management Workshop for H3Africa researchers in Cape Town following the fourth H3Africa Consortium meeting. The consortium meeting was attended by several H3ABioNet co-PIs, who had a chance to interact with H3Africa PIs and participate in working group meetings. I gave a report back on H3ABioNet progress and three posters were presented. In July NABDA ran a metagenomics workshop, again providing the opportunity for H3ABioNet and other H3Africa researchers to interact.

In July, we welcomed the appointment of the H3Africa Training Co-ordinator, Dr Victoria Nembaware, who will work with the whole consortium to develop and implement a successful training plan. We are pleased Vicky, who was a PhD student and Postdoc in Bioinformatics before moving onto other ventures, has come back to join us in the Central team! CBIO or H3ABioNet Central, has been busy, as usual, wrapping up facilitation of server purchases for nodes, developing policy and guideline documents and keeping a handle on multiple H3ABioNet projects. We are working on the agenda and reports for the upcoming H3ABioNet consortium meeting, which will take place in October in Casablanca, Morocco. I look forward to hearing everyone's reports and having fruitful discussions at this meeting!

Prof. Nicky Mulder.



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• Education and Training

The H3ABioNet Education and Training working group has been quite busy with organising the Data Management workshop aimed at the H3Africa projects and timed to coincide with the 4th H3Africa meeting in Stellenbosh to enable the H3Africa projects to reduce their travel costs. The NABDA Node also organised and hosted a one day symposium and a four day microbiome workshop at the University of Ibadan in Nigeria. More about the H3ABioNet Data Management workshop and the NABDA microbiome workshops can be found later in this newsletter. The participant survey results from the H3ABioNet / CUBRe Postgraduate Bioinformatics and Data Management workshops have been compiled and are available for members from the H3ABioNet website. An exciting outcome from the H3ABioNet Bioinformatics Curriculum development workshop held in Botswana has been the formation of an African Bioinformatics Education Committee and a Bioinformatics Curriculum content development task force which will help to create a standardised bioinformatics curriculum. Both groups have met twice with positive outcomes and the progress of the two groups will be reported in subsequent newsletter editions.

Another very exciting announcement is the appointment of a new H3Africa training co-ordinator, Dr. Victoria Nembaware effective from 1 July, 2014.

Sumir Panji.



“I am honoured and excited about the possibilities that lie ahead. H3Africa is well-positioned to build a strong network of genomics researchers across Africa and to strengthen training capacity in this field.”

“Strengthening efforts towards building training capacity will require 1) innovative sharing of resources and ideas across the network 2) continual monitoring and evaluation of the efforts to facilitate adaptation and improvement of our activities 3) building a knowledge management system which future generations can build upon. I look forward to working with H3Africa consortium members towards these and many other goals.”

“My immediate tasks include: analysing past and future training activities funded through different H3Africa projects to identify gaps and to promote consolidated training activities across the network; standardizing evaluations of training activities and gathering challenges and needs from consortium members at different levels of career development. Over the course of the next couple of weeks I may ask you to fill in a survey or join a conversation via Skype, however please feel free to contact me directly vnembaware@gmail.com if you need to discuss training related matters.”

Dr. Victoria Nembaware.



- Infrastructure

The Infrastructure working group was involved in providing input for the H3ABioNet data management workshop held in Cape Town. The proposed data archive solution for the data submission policy developed by H3Africa was presented by Suresh Maslamoney and talks were ongoing with the project manager from the European Genome-phenome Archive (EGA), Ilkka Lappalainen who was providing presentations on the EGA and European Bioinformatics Institute (EBI) resources. Talks were very positive with EGA regarding H3ABioNet as a data co-ordination center that will securely obtain, store and submit the data generated from the H3Africa projects to the EGA. Various measures were discussed about the data submission workflow EGA follows and how best H3ABioNet can mirror this workflow as closely as possible. A Service Level Agreement (SLA) on the specifications for the H3ABioNet H3Africa data archive was drafted and submitted to the University of Cape Town's (UCT) information and communications technology service (ICTS) department to determine what they could offer and provide a costing estimate for the hardware and implementation of the proposed data archive.

In the interim, Mohamed Alibi from the Institute Pasteur Tunis (IPT) completed an internship at the University of Illinois that looked at various transfer mechanisms to provide secure transfer of large datasets in regions that have very poor internet connectivity that result in a lot of interruptions. Mohamed conducted a lot of testing of different types of transfer protocols and Globus online www.globus.org/about was the solution decided upon. Mohamed has tested Globus online in a variety of use cases and for a number of different platforms and has developed documentation for the installation and use of Globus online. Mohamed will be contacting all the nodes in batches and will assist them in installing Globus online. Installation of Globus online will be an important milestone for each of the H3ABioNet Nodes since large data sets are becoming the norm and transfer of such datasets will be vital for the development of any bioinformatics unit to ensure the success of collaborations and projects.

Sumir Panji.



- **Research**

The research working group has been working on developing the collaborative research proposal <http://surveys.h3abionet.org/researchproposal> to facilitate research collaborations for Nodes looking to undertake joint research projects but who require a component or skills available in a partner Node.

As part of the H3ABioNet CUBRe postgraduate workshop, collaborative projects between the students have been initiated which are:

- 1) Identifying and Predicting the Function of Hypothetical Proteins involved in the Carotenoid Biosynthesis Pathway in *Sorghum bicolor* using bioinformatics tools
- 2) Analysis of genetic variation associated with Uterine fibroid susceptibility among Africans.

The RSWG is busy working with the various groups of students assisting them to develop concept notes, project milestones and also discuss which sub groups of students will work on which sections of the project as one would when working on a collaborative research project. Currently these projects will have reporting templates created for them and will have specific Node PIs attached to the projects to help provide expertise, guidance and mentorship to enable the students to complete these projects and facilitate the students' continuous learning.

As there have been various internships that have taken place, a form of reporting and following up with the students is required to determine what difficulties and challenges they might be facing when they return their home Institutions and any plans for dissemination of knowledge they have gained from their internships. The RSWG has approved this template and has currently sent it out to the year 1 interns to complete.

In preparation for the upcoming H3ABioNet and Scientific Advisory Board (SAB) 2014 meeting, a template for the Nodes to highlight what skills they have available or what datasets they currently have and need bioinformatics assistance with has been drafted and will be emailed to the General Assembly (GA) mailing list. All Node PIs are requested to complete this template and send it back to Sumir Panji and Nicola Mulder in good time in order to enable the RSWG to help plan any side meetings and facilitate discussions by different groups with similar goals.

Sumir Panji.



User Support

- User Support

The User Support Working group activities during this reporting period focused on the evaluation of Helpdesk processes, website outlook, and discussions of improvement strategies. This was masterminded from the report of the recently completed H3ABioNet Helpdesk evaluation by parties external to the USWG to avoid any bias. The USWG will be looking at the recommendations made by the evaluation report and will provide a detailed response to the report to the H3ABioNet Management Committee (MC) and then ultimately to the General Assembly (GA).

Some recommendations involve the H3ABioNet Helpdesk categories which, in their current state, appear to be broad and generic, which perhaps makes it unattractive for engaging users with subject-specific queries. The categories were initially tailored to the anticipated needs and requisite tools of H3Africa projects. We have since expanded the scope of the H3ABioNet Helpdesk resource beyond H3Africa and the categories are being re-examined to be more specific to the bioinformatics expertise being offered. In addition, formal SOPs are being designed and adopted by the USWG to improve bioinformatics workflows. Promotion of the H3ABioNet Helpdesk is also being undertaken through increased outreach and communication activities, and advertisement at various fora. A poster on H3ABioNet activities was also recently presented at the 4th H3Africa meeting held at Stellenbosh in addition to designing, printing and distribution of brochures on the H3ABioNet Helpdesk activities at the same event.

The H3ABioNet website has also undergone some upgrades during this period. New features have been incorporated for easier site navigation and the site is more current and richer in content. As an example, nodes are now able to edit their profiles online once they determine who from their Node will take the responsibility and submission of an H3ABioNet Helpdesk request. As a result of the new changes for the H3ABioNet website, the USWG focused on creating a website specific H3ABioNet newsletter that focused on 24 common questions one might ask.

Dr. Judit Kumuthini. Dr. Jonathan Kayondo.



- **Node Accreditation**

Node Accreditation

In May 2014, the Wits H3ABioNet Node became the first Node to undertake a formal assessment exercise. They chose to be assessed for their capacity to analyze genotyping data produced by Affymetrix SNP arrays, and to perform Genome-Wide Analysis Studies (GWAS) on genotypes from a case/control study. The test datasets and the SOPs describing the recommended procedures for analyzing the data were prepared by the Node Assessment Task force, primarily by Ayton Meintjes, Mamana Mbiyavanga and Emile Chimusa from the UCT and CPGR nodes respectively. The report prepared by the Wits' group describing their analysis and the results they obtained, was provided to two external experts, Noah Zaitlen from UCSF and Mariet Allen from the Mayo Clinic. I am pleased to let you know that both experts agreed that the Wits group had done an excellent job, and therefore is now accredited for the analysis of genotyping data and for performing GWAS. Congratulations to Prof. Scott Hazelhurst and his team!

In total, eleven people participated in the analysis, with a core team of 5 scientists and a "shadow" team of six. It is worth noting that the Wits' node took maximal advantage of educational opportunities offered by H3ABioNet, by associating an intern funded by the network to the core analysis team and by organizing a training workshop just before they undertook the exercise. These are both excellent initiatives and should provide inspiration to other potential candidate nodes.

Second, they made their methods and results available to the community: "A selection of the scripts used and results obtained are available as a guide to future readers. The scripts are available at <http://www.bioinf.wits.ac.za/h3a/scripts>. The results are available at <http://www.bioinf.wits.ac.za/h3a/results>."

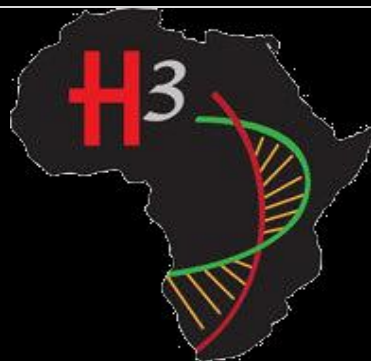
These resources, which are publically available, will be added to the materials provided by the NATF to candidate nodes. They cannot be used "as is" outside the specific computational environment at Wits, but provide excellent templates for other nodes to use when they perform their analyses. The results, of course, are specific to the datasets given to Wits.

Finally, they have written a very nice summary of their experience: "The whole exercise was a very valuable one for the node. Coupling it with a training programme was very sensible as we were able to use the experience as a focus for a set of activities that got the whole team involved. The internship worked very well, and our intern contributed significantly to the work and content of this report. Our shadow team also helped with some of the analyses and also meant that the benefit of the experience spread beyond the core team."

Both reviewers agreed that the Wits' group had done a very good job, and more than deserved to get our seal of approval. While there were a few remarks that suggested improvements in their analysis protocols, many could be traced back to problems with the test datasets. This does not indicate by any means that the exercise has to be completely revised, but we are tweaking both the data and associated metadata, and doing some more work on the SOPs.

It is important that all nodes, and particularly those with a status of "full node", prepare to submit to at least one of the assessment exercises. The UCT node has announced that it will perform the human variant calling from NGS data exercise in September. I hope that many other H3ABioNet Nodes will follow suit in the coming months.

Prof. Victor Jongeneel.



4th H3Africa Meeting, Stellenbosch, 2014

- 4th H3Africa Meeting, 2014

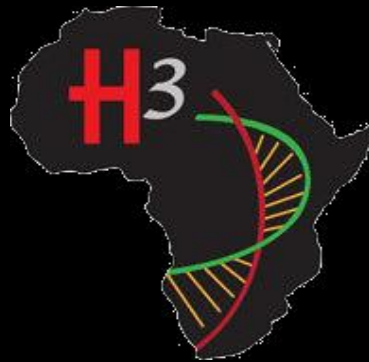
The 4th H3Africa meeting took place at the Spier Wine and Conference Estate in Stellenbosch, South Africa between 30th of May and 2nd of June 2014. The first day of the 4th H3Africa meeting was an open workshop devoted to Cardiovascular disease organised by the H3Africa Cardiovascular working group which also involved a poster session by attendees.

The 31st of May and 1st of June was a closed meeting for registered H3Africa consortium members only whereby each of the individual H3Africa projects provided updates on their projects and the various H3Africa working groups also provided progress updates on their activities. The various H3Africa working groups had their working group meetings in the breakaway sessions to consolidate their upcoming goals and determine what their immediate focus areas should be.

The last day of the 4th H3Africa meeting was an open workshop organised by the H3Africa Genome Analysis working group which brought together multiple experts in the field of population genetics and genome wide association testing to provide talks on their current research. An afternoon panel discussion session had representatives from the various micro-array companies that manufacture custom SNP chips for various populations and studies to determine how best to go about designing an African diversity SNP chip and what input the established industry companies can provide.

The 4th H3Africa meeting was unique in that it provided travel fellowships for H3Africa fellows to attend the meeting and present their posters during the poster sessions. H3ABioNet was fortunate enough to have three different posters accepted and presented which were "NetCapDB: A database tool to monitor capacity building in Africa" by Dr. Jean-Baka Domelevo Entfellner *et al*, "Description of F cells in Sickle Cell Anaemia in Tanzania" by Florence Urio *et al* and "H3ABioNet a Pan-African Bioinformatics Network for Africa" which was driven by the H3ABioNet User Support Working Group on behalf of H3ABioNet. In addition to the posters presented by H3ABioNet, flyers were designed and printed for distribution to advertise the H3ABioNet Helpdesk and other research activities undertaken by H3ABioNet to support the H3Africa projects' bioinformatics needs. All the posters presented can be accessed on the H3ABioNet website under the Outreach tab.

Sumir Panji.



4th H3Africa Meeting, Stellenbosch, 2014

The research fellow that was selected by the H3ABioNet MC to present their poster was Florence Urio from Muhimbili University of Health and Allied Sciences (MUHAS), Tanzania – congratulations Florence!

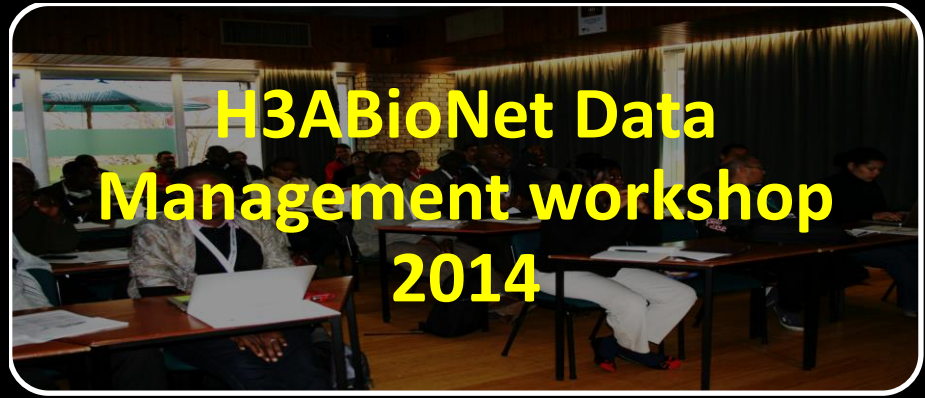


- 4th H3Africa Meeting, 2014

Florence Urio (BSc, MSc) received her Bachelor of Science in Molecular biology, Physiology and Chemistry from University of Namibia, Windhoek, Namibia in 2008 and her Master of Science in Molecular Genetics and Physiology from Linköping University in Linköping, Sweden in 2012. She is currently employed by Muhimbili Wellcome Programme as a Research Scientist in Dar es Salaam, Tanzania. She has been working on a project titled “Description of F cells in Sickle Cell Disease in Tanzania”. She received training on Flow Cytometry specifically in enumerating F cells in SCD from Kings College London in September – October 2013. She is also a member of Tanzania Genome Network (TGN) which aims at working together as a group to consolidate existing and developing resources in genetic/genomic research in each institution to minimize duplication and ensure expertise and resources are utilized in an optimal manner. Her interest is in Molecular Hematology and she hopes to register for her PhD in the near future.



Group photo of the 4th H3Africa meeting attendees at Stellenbosch, June 2014.

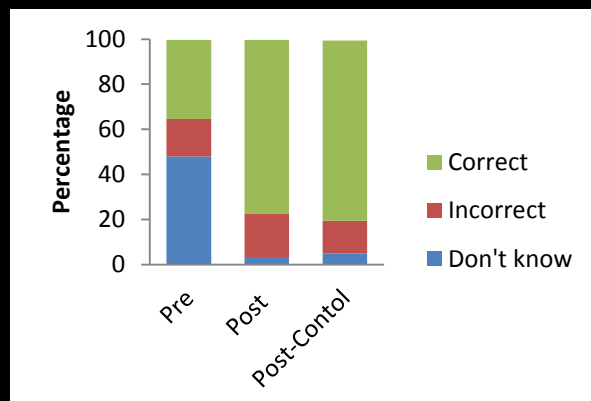


- **H3ABioNet Data Management workshop 2014**

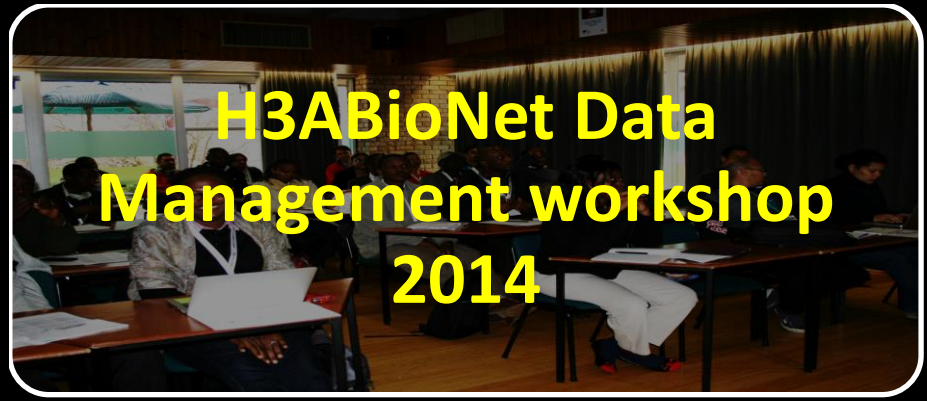
H3ABioNet ran a data management workshop from the 3rd to the 6th of June 2014 aimed at H3Africa personnel, which coincided with the end of the H3Africa meeting to take advantage of reducing travel costs for each of the H3Africa projects. The data management workshop was aimed at data managers and H3Africa members involved in collecting and processing the data. The H3ABioNet data management workshop was attended by 37 participants from a range of H3Africa projects and had 14 invited speakers. A wide range of topics were covered which included data consent and ethics, patient databases, different types of LIM systems for biobanking, the H3Africa data access policies, ontologies and phenotypes, the proposed H3ABioNet data submission and archive workflow, European Genome phenome Archive (EGA) data formats and submission guidelines, introductory GWAS, NGS and microbiome and the computational resources required to run such analyses and data security and transfer. As the range of topics covered were diverse and the time span quite short, the workshop took the form of a symposium whereby specialists provided talks in their areas of expertise and answered numerous questions that the participants had. The content for the data management workshop which includes the recorded talks and slides are all available from the H3ABioNet website: <http://www.h3abionet.org/data-management-workshop-2014>

A lot of discussion was had and the possibility of an African Variation Archive, similar to EBI's European Variation Archive (EVA), was mooted and well received by the participants. Another thrilling outcome was the formation of an ontology task force that will look at sourcing ontologies and mapping them to the phenotype and experimental data generated as well as sourcing ontologies for biobanking.

Overall the H3ABioNet workshop was deemed to be a success by participants, also as measured by a knowledge gain survey run by Dr. Nembaware pre and post workshop with a control group as shown below:



Proportion of participants who answered questions in the survey correctly, incorrectly or indicated that they didn't know the answer for the H3ABioNet data management workshop.



- H3ABioNet Data Management workshop 2014



Participants paying attention to Shaun Aron's talk on Introduction to GWAS analyses while Prof. Hazelhurst completes the Wits' H3ABioNet GWAS accreditation exercise report



Group photograph of participants and lecturers for the H3ABioNet data management workshop



The National Biotechnology Development Agency Node of the H3Africa Bioinformatics Network (H3ABioNet) Metagenomics Data Analytics Workshop was held at Ibadan, Nigeria from 21st to 25th July, 2014. The lead workshop organizer was Dr. Oyekanmi Nash of NABDA. The objectives of the workshop were to provide training on bioinformatics tools for analytics of the human microbiome data, and to promote new collaborations in Africa that will translate microbiome data to products for preventing disease, promoting health and curing illness. The 5-Day workshop started with a Symposium on “Utilizing Microbiome for Translation Products in Africa” with speakers drawn from the University of Ibadan, J. Craig Venter Institute (JCVI) and H3A Projects. The 1 day symposium was followed by 4 days of lecture and practical sessions on metagenomics, led by Dr. Andrey Tovchigrechko of the JCVI.

Three major H3Africa Projects were ably represented during the symposium: H3Africa Kidney Research Network (Prof. Tunde Salako); H3A Stroke Investigative Research & Education Network (SIREN; Prof. Mayowa Owolabi) and an H3Africa Biorepository (Prof. Akin Abayomi). The symposium was organized in collaboration with the University of Ibadan Research Foundation (under the Directorship of Professor Ayoade Oduola), and chaired by the Dean of the University's Postgraduate School, Professor Olajide Olorunnisola. As part of the symposium, a plenary session on Roadmap to genomics application in Nigeria was held, which suggested some strategic priorities for the University of Ibadan to take advantage of Genomic Applications in Research. Over 200 participants, mostly postgraduate students from Life and Physical Sciences were registered for the occasion.

There were 21 participants at the training sessions from Mali, Ghana and Nigeria. The instructors, which included Dr. Andrey Tovchigrechko, Dr. Andreas Wilke and Dr. Raphael Isokpehi, were assisted by Dr. Angela Makolo and Bukola Smile (participants in the previous H3ABioNet Train the Trainer courses). The Metagenomics Data Analytics Workshop included the following topics: MG-RAST Web User Interface; Introduction to using Amazon cloud computing; Introduction to basic Unix shell use and Makeflow workflow; Introduction to basic Python programming environment; Introduction to basic R programming environment; Tutorial on MG-RAST matR R package; Tutorial on JCVI MGSAT R code; Data Analytics of Metagenomics Data. The Course Project was on the Bioinformatics and Genomics Evaluation of Stress Response Systems in Bacteria Associated with Chronic Wound Biofilms.

- **NABDA Metagenomics Data Analytics workshop**



- **NABDA
Metagenomics
Data Analytics
workshop**

One of the objectives of the workshop was to promote new collaborations in Africa that will translate microbiome data to products for preventing disease, promoting health and curing illness. A theme of interest for the H3ABioNet NABDA node was Biofilms and Microbial Stress Response. Through the 2014 Metagenomics Data Analytics Workshop, three projects were initiated that are related to chronic wounds associated with human schistosomiasis, diabetes and sickle cell disease.



(L-R): Dr. Andrey Tovchigreckho; Prof. Mayowa Owolabi; Prof. Ayoade Oduola; Prof. Akin Abayomi; Prof. Jide Olorunnisola; Prof. Abiodun Onilude; Prof. Gladys Falusi; Prof. Oyekanmi Nash and Dr. Angela Makolo



Group picture of the NABDA metagenomics data analytics workshop 2014 participants



- **Announcements**

Announcements

- Congratulations to Florence Urio from MUHAS who was selected by H3ABioNet for an H3Africa travel fellowship to present her work at the 4th H3Africa meeting in Stellenbosch, South Africa.
- Congratulations to Ozlem, Ezekiel, Ahmed, Dean, Kais, Amel, Judith, Nicky Mulder, Sumir and Hugh Patterton for their recent publication in Briefings in Bioinformatics “Bioinformatics Education-Perspectives and Challenges out of Africa.” (PMID: 24990350)
- The Malawi Liverpool Wellcome Trust Clinical Research Programme and Sanger Institute will be hosting a workshop called “Working with Pathogen Genomes” in Malawi between the 23rd to the 28th of November, 2014
- The Malawi Liverpool Wellcome Trust Clinical Research Programme will be hosting a workshop called “Working with the Human Genome Sequence ” in Blantyre, Malawi between the 26th to the 30th of January, 2015
- The H3ABioNet and Scientific Advisory Body (SAB) annual meeting will take place in Morocco between the 13th and 15th of October, 2014.



- **Important Dates**

Important Dates

31st July – End of the financial year for all H3ABioNet Nodes

- **15th August:** Last date of submission for the final claim of the financial year for all H3ABioNet Nodes
- **29th August:** Last date for submission of annual financial report for all H3ABioNet Nodes
- **5th September:** Deadline for applications for the “Working with Pathogen Genomes” workshop by the Malawi Liverpool Wellcome Trust Programme Clinical Research Programme in Malawi
- **7th September:** Deadline for all H3ABioNet Nodes to register for their attendance at the annual H3ABioNet and Scientific Advisory Body meeting in Morocco
- **26th September:** Deadline for applications to the “Working with the Human Genome Sequence ” workshop by the Malawi Liverpool Wellcome Trust Programme Clinical Research Programme in Malawi
- **8th to 9th September:** The second Biological and Genomics Data Mining 'Biomining2014' organized by H3A Bioinformatics Network –Morocco with the participation of the Moroccan Classification Society and the Biotechnologies Laboratory of Mohammed V university-Rabat, will be held in Rabat (<http://biom14.conferences-it.com/index.html>).
- **13th to 15th October:** H3ABioNet and Scientific Advisory Body (SAB) annual meeting in Morocco



- **Upcoming H3ABioNet Working group meetings**

H3ABioNet Working Group Meeting Schedule until October 2014

Summary of H3ABioNet upcoming working group meetings

Working Group	Time	Date and Month	
E&TWG	UTC = 11am	8 th	July
E&TWG	UTC = 11am	22 nd	July
E&TWG	UTC = 11am	26 th	August
E&TWG	UTC = 11am	30 th	September
E&TWG	UTC = 11am	28 th	September
RSWG	UTC = 9am	18 th	July
RSWG	UTC = 9am	15 th	August
RSWG	UTC = 9am	19 th	September
RSWG	UTC = 9am	24 th	October
ISWG	UTC = 1pm	4 th	July
ISWG	UTC = 1pm	1 st	August
ISWG	UTC = 1pm	5 th	September
ISWG	UTC = 1pm	3 rd	October
USWG	UTC = 9am	11 th	July
USWG	UTC = 9am	8 th	August
USWG	UTC = 9am	12 th	September
USWG	UTC = 9am	10 th	October
NAWG	UTC = 1pm	25 th	July
NAWG	UTC = 1pm	29 th	August
NAWG	UTC = 1pm	26 th	September
NAWG	UTC = 1pm	31 st	October

Acronyms used for the various H3ABioNet working groups

E&T WG	Education and training working group
RSWG	Research working group
ISWG	Infrastructure working group
USWG	User support working group
NAWG	Node accreditation working group

Time zone conversion table to UTC for all of H3ABioNet working group meetings

UTC Time Offset	Time Zone Name	Regions / Countries in the Timezone offset
-5 hours (-6 hours)	CDT	Chicago, USA (2nd November, 2014)
-4 hours (-5 hours)	EDT	Boston, USA (2nd November, 2014)
0 hours	GMT	Burkina Faso, Ghana, Mali, Morocco, Senegal
+1 hour	WAT	Cameroon, Chad, Gabon, Namibia, Nigeria, Niger, Tunisia
+2 hours	CAT	Botswana, Egypt, Malawi, South Africa, Sudan, Zambia
+3 hours	EAT	Ethiopia, Kenya, Tanzania, Uganda