

RESEARCH CYBERINFRASTRUCTURE COLOMBIA

WORKSHOP, BOGOTA 2018

PROGRAMME

26 - 28 JUNE 2018



Welcome

We are delighted to welcome you to this workshop, a chance to explore how to grow research capacity to enable large scale, high throughput analysis of biological data in Colombia.

We will hear from experienced leaders in open data sharing, who will offer valuable insights into how scientific data and tools are shared through federated resources such as Cyverse UK, and together we will discuss how to innovate and expand such capacity here in Colombia.



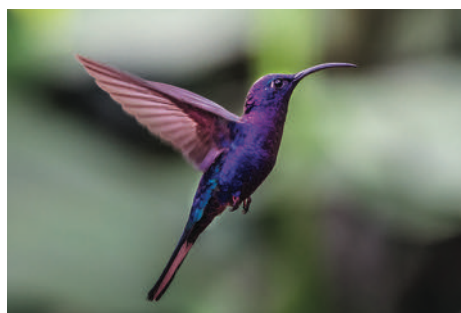
Diversity and abundance

Colombia is a country of stunning beauty and megadiversity; geographically, culturally and biologically. The information contained within the genomes of every one of the as yet unsequenced samples in Colombian rainforests, mountains, coastlines and natural collections has the potential to add species to the public perception that have never been known, while allowing us to investigate biological diversity in more depth than ever before.

Colombia is the number one hotspot for orchid, bird and amphibian diversity worldwide, with vast regions yet to explore; an “environmental powerhouse”.

Exploring and investigating the swathe of information contained within each of the thousands of species of these organisms, especially with the advent of modern life sciences methods, starts to stretch the capacity of single research groups.

One way of ensuring the efficient and accurate analysis of such abundant data is to cultivate and foster a research cyberinfrastructure (RCI).



Community driven discovery

The main goal of an RCI is to enable data-driven scientific discovery. An RCI represents not only advanced hardware but a community of people and institutes who can manage and share computational resources in a sustainable, secure, collaborative and interoperable way. Without common building blocks it can often be difficult to combine and reproduce data, especially when teams are using different software, leading to wasted time and effort.

Essentially, an RCI aims to meet the needs of the life science community through democratised access to computational resources, particularly supporting international collaborations flexibly across multiple institutes.

The potential for data to transform how we tackle many of the major challenges faced by humanity, from climate change and environmental sustainability to conservation and food security, is huge.

This can only be achieved through a greater access to data, enabled through effective and efficient infrastructures - ensuring that we are harnessing the best expertise from all around the world to work on this swathe of grand issues.



Values

At the heart of the Earlham Institute are the following core values. We consider these to be a sound basis for any working relationship such as that formed by the group of delegates contributing to this workshop:



Day 1

Tuesday 26 June

09:00 - 10:00	Flash introductions (2 min / institution) <ul style="list-style-type: none">• What do my users/user-cases look like? What are their needs?• Introduce yourself and other members of your institution
10:00 - 11:00	Identifying needs <ul style="list-style-type: none">• Write one weakness or thread from the point of view of the users in each sticker (red or yellow).• Discussion: Grouping and prioritizing.
11:00 - 11:30	Coffee break
11:30 - 12:30	Flash introductions (2 min / institution) <ul style="list-style-type: none">• What does my institution have/do that is great? How could we make this even better?
12:30 - 13:30	Identifying resources <ul style="list-style-type: none">• Write one strength or opportunity from the point of view of the suppliers in each sticker (green or blue).• Discussion: Grouping and prioritizing.
13:30 - 14:30	Lunch
14:30 - 16:00	Identifying topics <ul style="list-style-type: none">• Digest. Anything missing?• Resolve overlaps and priorities• Proposal of topics and setting/agreeing objectives for each
16:00 - 16:30	Identifying groups: Find balance. Designate chair, speaker and scrivener for each group.
Evening	Transport and Workshop Dinner: Salto de Angel, Cra. 13 #93A-45, Bogotá, Cundinamarca, Colombia

Day 2

Wednesday 27 June

09:00 - 11:00	SWOT analysis in each topic (Divided in groups) <ul style="list-style-type: none">• Each group has a chair to moderate the discussion• Scrivener to share a document in googledrive• Approx. 20 min per box (S, W, O, T)
11:00 - 11:30	Coffee break
11:30 - 12:30	Each group reports backs (Speaker) and general discussion
12:30 - 13:30	Vision statement in each group (Same document) <ul style="list-style-type: none">• What is our ideal future in short, middle and long term?
13:30 - 14:30	Lunch
14:30 - 16:30	Roadmap proposal in each group (Same document) <ul style="list-style-type: none">• Milestones and action points (How can we reach that ideal future?)• Risk assessment (How might we fail? How can we prevent it?)

Day 3

Thursday 28 June

09:00 - 11:00	A white paper strategy: Discuss a document structure and dissemination
11:00 - 11:30	Coffee break
11:30 - 13:30	Planning ahead <ul style="list-style-type: none">• Consortium and declaration/press• Task forces and roles
13:30 - 14:30	Lunch

Organisers

EARLHAM INSTITUTE



Name: Federica Di Palma, Director of Science

Affiliation: Earlham Institute, Norwich, UK

Prof Federica Di Palma (PI) is the Director of Science at the Earlham Institute (EI), (and director of the [BRIDGE Colombia](#) network of researchers across the UK and Colombia).

Prof Di Palma leads a number of research programmes aimed at understanding the evolution of complex traits and the regulatory processes underlying evolutionary change. Her research spans a wide variety of vertebrate species including mammals and cichlids. She is also interested in using this genomic information for understanding key organisms important for food security as well as the conservation of threatened and endangered species.

She has also implemented several research programmes for countries on the DAC list aimed at building partnerships, generating genomic resources and delivering technical training events in genomics and informatics.

Prof Di Palma received her Ph.D. in Immunogenetics from the Institute for Animal Health and the University of Reading, and was subsequently awarded a Fogarty Fellowship from the National Institute of Deafness and Communication Disorders (NIH). She was at the Hubbard Centre for Genome Studies, University of New Hampshire, where she was a research scientist and manager of the genome centre with a focus on environmentally important species.

Before moving to Norwich, she was at the Broad Institute of MIT and Harvard where she served as Assistant Director of Vertebrate Genome Biology, and remains a visiting scientist. Prof Di Palma holds honorary Professorship positions at the School of Biological Science and Norwich Medical School, University of East Anglia.



Name: Robert Davey, Group Leader

Affiliation: Earlham Institute, Norwich, UK

Robert's main interests are in enterprise-grade software development, with over 15 years professional experience in system administration, programming, and web service technologies. He enjoys researching data management and associated HPC infrastructure, sequence analysis and quality control pipelines, novel visualisation strategies for sequencing and biological data, metadata and the Semantic Web, and is an advocate of the open science ethos.



Name: Jose De Vega, Research Fellow

Affiliation: Earlham Institute, Norwich, UK

I am a Fellow at Earlham Institute (EI), delivering a research programme in agricultural biodiversity and genomics. My interests lie with genomics, bioinformatics and breeding; at the core of my research is forging effective partnerships with plant breeders, researchers and gene banks. Among my main objectives, is to actively contribute to the Global Development Goals (SDGs) and EI's international development strategy, where I apply multidisciplinary Agri-tech research to help feed a changing world. I'm keen to engage with researchers and stakeholders and strongly support collaborative, open-source principles in science and its data.

I joined EI in 2013 as a Postdoctoral Researcher to work on the red clover genome. Since 2015, I'm now also managing the ryegrass and Bracharia genome projects, as well as a large rice genomics project in Vietnam. My Group are part of one of the Institute's primary grants awarded by the Research Councils UK to grow academic capability in Colombia through training workshops, research and technology dissemination. Previous to EI, I worked on oak and pine transcriptomics at ITQB in Lisbon for three years, after finishing my PhD on bean fungal disease in Salamanca, Spain, in 2009.

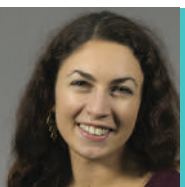


Name: Graham Etherington, Senior Computational Biologist,

Affiliation: Earlham Institute, Norwich, UK

I am the Senior Computational Biologist in the Di Palma group. I use a number of whole genome sequencing approaches to sequence various vertebrates in order to answer questions related to conservation, population and evolutionary genomics, hybridisation, domestication and species diversity. I use the latest technologies available at the Earlham Institute such as BioNano, 10x Genomics, PacBio and Illumina to sequence and assemble previously uncharacterised genomes. I also develop bespoke software to help me and others handle and analyse large sequence datasets. My

responsibilities also extend to bioinformatics training, outreach and CITES co-ordinator. My training courses often involves the use of the Galaxy bioinformatics platform, for which I have experience of administering and creating bespoke bioinformatic tools. My current research includes looking at Mustelid (polecats and ferrets) diversity and I'm heavily involved in marsupial genome sequencing and analysis. I also have a great interest in avian genomics.



Name: Alica Minotto, CyVerse UK DevOps Engineer

Affiliation: Earlham Institute, Norwich, UK

I hold a masters in molecular biology from the Università degli Studi di Milano, where I worked on a project on genome assemblies with NGS data. After that I moved to The Sainsbury Laboratory as a pre-doctoral intern, contributing to a project aimed at modelling pathogen genome size evolution following host jumps.

At the Earlham Institute, I'm a DevOps engineer for CyverseUK, the main purpose of which is to give the life science research community access to HPC infrastructure and to promote collaborative science.

OREGON STATE UNIVERSITY



Name: Monica Munoz-Torres, Project Manager for Scientific Software, Translational and Integrative Sciences Lab

Affiliation: Oregon State University & Oregon Health and Science University

I am a curator of genomes and I manage software development for genome curation. The focus of my work is finding more effective ways to share genomic information across research communities, as well as outlining ever-more intuitive ways of annotating and curating genes in a collaborative environment. I'm very passionate about scientific communication and efforts to increase diversity and inclusion in the sciences, especially in technically oriented environments. I'm the former Chair of the Executive Committee of the International Society for Biocuration (ISB) and a member of the Steering Committee of the global initiative to sequence the genomes of 5,000 arthropods (i5k Initiative).

At Phoenix Bioinformatics I managed development of software for functional annotation of genomes. At Berkeley Bioinformatics Open-Source Projects (Lawrence Berkeley National Laboratory) I managed development for Apollo - a web-based genome annotation editor designed to support community-based curation - and also managed outreach and user advocacy of the Gene Ontology (GO) Consortium. At Smithsonian I lent computational genomics expertise and advice to the Steering Committee of the Biodiversity Genomics Initiative. At Georgetown University I was the curator of Hymenoptera Genome Database and contributed to maintaining genomic data for over a dozen species of insects.

IBUN-NATIONAL UNIVERSITY OF COLOMBIA



Name: Emiliano Barreto-Hernández, Associated Professor and senior researcher

Affiliation: IBUN- National University of Colombia

Emiliano Barreto-Hernández is Associated Professor and senior researcher of the IBUN-National University of Colombia. He is manager of the Colombian EMBnet node since 2002 and has experience in protein domain identification using HMMs, building and managing SQL databases,

designing and implementation of information systems like the beta-lactamase information system BLA.id. He has been involved in several research project in the area of bioinformatics and molecular epidemiology, in particular in a sequencing project of different multidrug resistant *Acinetobacter* species.

UNIVERSIDAD DE LOS ANDES



Name: Jorge Duitama Castellanos, Software Engineer and Computer Scientist

Affiliation: Universidad de los Andes

Jorge Duitama Castellanos is a software engineer and computer scientist with large experience in bioinformatics. Jorge finished his Ph.D. at the computer science department of University of Connecticut working on prediction of neo-epitopes for cancer immunotherapy. He has worked as a postdoc at the lab of Kevin Verstrepen in KU Leuven and as a researcher in bioinformatics at the International Center for Tropical Agriculture (CIAT). Jorge is currently visiting professor at the computing and systems engineering department of Universidad de los Andes.

throughput sequencing data, including NGSEP for variants detection, genotyping and population genomics, ReFHap for molecular haplotyping, Explora for QTL mapping in pools of segregants from biparental populations and PrimerHunter for early detection and subtyping of viral infections. These tools have been widely used in different fields including human genetics, bioethanol production and molecular breeding of food security crops. Jorge has also contributed to the production and analysis of large-scale genomic databases of different crop species including rice, beans, cassava and sugarcane.

Through these works, Jorge has contributed different bioinformatic tools for analysis of high

Workshop Facilitators



Name: Felipe Garcia
Affiliation:



Name: Silvia Otero
Affiliation:



Name: Mateo Prada Quintero Otero
Affiliation:

Participants



Name: Dany Molina,
Affiliation:

I am a professional with more than 12 years of experience as a systems engineer in innovation projects, computer solutions, security techniques, analyst and research using technology to optimize or revolutionize processes.

With my professional knowledge in systems and the master in expert systems and artificial intelligence center my professional training in systems thinking as the foundation for change in work environments, in search of aligning my knowledge and skills with the needs of the organization. My strengths for leadership, commitment, responsibility, interpersonal

relationships, research and continuous improvement on a personal and professional level. I have knowledge in methodologies for the government and management of information technologies in different levels of experience.

BRITISH COUNCIL BOGOTA



Name: Luis Calzadilla
Affiliation: British Embassy Colombia

Luis Calzadilla has a BA Degree in Social Communication, a Master's Degree in Social Development and a Diploma in Public Policies for Development. He is currently the Head of Science and Innovation at the British Embassy in Colombia. Between 2014 and 2017 he was Director of the Newton-Caldas Fund at the British Council Colombia, institution from which he led Science and Innovation programmes to promote socio-economic development in Colombia.

Luis Calzadilla has a BA Degree in Social Communication, a Master's Degree in Social Development and a Diploma in Public Policies for Development. He is currently the Head of Science and

Innovation at the British Embassy in Colombia. Between 2014 and 2017 he was Director of the Newton-Caldas Fund at the British Council Colombia, institution from which he led Science and Innovation programmes to promote socio-economic development in Colombia.

Between 2013 and 2015, also in the British Council Colombia, he was Director of Projects & Partnerships, and his main responsibility was leading on projects to formulate, implement and evaluate public policy at national, regional and local levels. His previous experience in the British Council Venezuela was primarily focused on education projects.

CENICAFE



Name: Romain Guyot. Researcher on Genomics, Genetics, Evolution and Bioinformatics
Affiliation: French Institute for Development (IRD)

Romain Guyot, PhD, HDR (romain.guyot@ird.fr) Researcher on Genomics, Genetics, Evolution and Bioinformatics at the French Institute for Development (IRD), IPME laboratory (<http://umr-ipme.ird.fr>), since 2005, Professor at the 'Universidad Autonoma de Manizales' Colombia since 2017 and 'Investigador senior Colciencias'.

Google scholar : <https://scholar.google.com/citations?user=1jAQU2wAAAAJ&hl=fr>
ResearchGate: <https://www.researchgate.net>
CVLAC: http://scienti.colciencias.gov.co:8081/cvlac/visualizador/generarCurriculoCv.do?cod_rh=0000040358

My main interest concern the bioinformatics approaches to understand the genome structure, evolution and dynamics of tropical plants and their pathogens. My main models are the cultivated coffee trees and its wild relatives with different lines of researches: Understand the molecular impact of climate changes on coffee genomes; Use of the potential of wild coffees for cultivated coffee breeding, understand the evolution and adaptation of wild coffee. My research is based on high throughput genome sequencing requiring the development of bioinformatic tools and cyber-infrastructures.



Name: Maria Camila Martinez, Computational Biologist

Affiliation: CENICAÑA

Camila Martinez is a Computational Biologist currently working at Centro de Investigación de la Caña de Azúcar de Colombia (CENICAÑA), where she processes sugarcane genomics data. Specifically, she is responsible to contextualize the genetic data of important Colombian sugarcane varieties that are of interest for the sugar sector.

Before starting working at Cenicaña, Camila finished a master's degree in Computational Biology at the Universidad de los Andes where for almost three years she gained experience with different types of

biological data. She helps researchers to understand their data through bioinformatics, machine learning methods and visualization.

Camila enjoys different types of extracurricular activities such as riding her bike in the mountains, playing tennis and volleyball. You can reach Camila at mcmartinez@cenicana.org



Name: John Jaime Riascos, Researcher

Affiliation: CENICAÑA

John Majored in biology from Universidad Del Valle in 2001 and received his Ph.D. from North Carolina State University, department of crop science, in 2009. For most of 2009 he was also affiliated as a postdoctoral researcher at Duke University. During his bachelor John worked in the characterization of the bean pathogen *Colletotrichum lindemuthianum* and during graduate school he focused in the characterization of soybean proteins with capacity to induce allergic reactions in sensitized humans.

Since 2010 John works at The Colombian Sugarcane Research Center (CENICAÑA) where he is leading the research in sugarcane genomics. In this position

he has taken advantage of the recent advances in DNA sequencing and, with the help of his group, has studied the patterns of gene expression in sugarcane genotypes with contrasting tolerance to drought and flooding, has worked in the implementation of a GWAS association model adapted to the complex ploidy of sugarcane and most recently has taken over the challenge of assembling a sugarcane hybrid genome. His final objective is to identify and characterize sugarcane genes and markers that can be used in the development of successful sugarcane hybrids.

In his free time John enjoys reading, playing tennis and hiking. Email: jjriascos@cenicana.org

CIAT



Name: Anestis Gkanogiannis, Lead Bioinformatician
Affiliation: CIAT

Anestis Gkanogiannis is currently the lead bioinformatician for the Agrobiodiversity Research Area of the International Center for Tropical Agriculture (CIAT) headquartered outside of the city of Cali in the Valle de Cauca department of Colombia. Anestis completed his studies in Greece (BSc in Experimental Physics from the University of Crete - UOC, MSc and PhD in Computer Science, with specialization in Machine Learning, Data Mining and Information Retrieval from the Athens University of Economics and Business - AUEB), before conducting a post-doctorate training in Data Mining at the University of New Brunswick – UNB, NB, Canada. Being amazed by the world of life sciences, he then moved into the field of bioinformatics by getting 2 additional post-

doctorate trainings. The first in the French National Sequencing Center - Genoscope – CEA, Paris, where he worked on algorithms for bacterial genomics and then the second in CIRAD, Montpellier, where he worked on methods for plant genomics. Since 2017 at CIAT he is being working with a broad team of geneticists, physiologists, breeders, molecular biologists and virologists, assisting in the activities of the Breeding Programs of Agrobiodiversity Area (Cassava, Bean, Rice, Tropical forages).

You can reach him as: a.gkanogiannis@cgiar.org



Name: Leroy Mwanzia - Chief Data Officer at CIAT - International Centre for Tropical Agriculture.
Affiliation: CIAT

Leroy leads CIAT's Data and Research Methods team which is responsible for managing the institution's research data and building statistical analysis capacity. He has 15 years' experience creating and working with large management, data and information systems. His interests include data engineering, software engineering, and open science (open access, open data, open source, open review, open methods and more). He previously worked with the World Agroforestry Centre (ICRAF) in Nairobi, creating research data management systems.

COLCIENCIAS



Name: Claudia Tinjaca
Affiliation: Colciencias

CORPOICA



Name: Alejandro Caro-Quintero, PhD Researcher
Affiliation: Corpoica

Alejandro Caro-Quintero is a PhD researcher at the Colombian Agricultural Research Corporation (CORPOICA). He holds a BSc in microbiology from Universidad de los Andes, with a Master's Degree (UPRM) and a Doctorate from the Georgia Institute of Technology (Georgia Tech). His PhD focused on the use of bioinformatics, genomics, metagenomics and metatranscriptomics, to understand on the effect of horizontal gene transfer in the adaptation of bacteria to multiple environments.

After his PhD, he worked as a Postdoctoral researcher at the University of Texas at Austin working on the coevolution of commensal bacteria in the human gastrointestinal tract and other hominoids. His research at Corpoica focuses on the use of high-throughput sequencing tools to improve the production and quality of agricultural and livestock systems. In 2018, Alejandro was nominated as the young ambassador of the ASM (American Society for Microbiology) for Colombia.



Name: Julio M. Duarte-Carvajalino, PhD researcher
Affiliation: Corpoica

Alejandro Caro-Quintero is a PhD researcher at the Colombian Agricultural Research Corporation (CORPOICA). He holds a BSc in microbiology from Universidad de los Andes, with a Master's Degree (UPRM) and a Doctorate from the Georgia Institute of Technology (Georgia Tech). His PhD focused on the use of bioinformatics, genomics, metagenomics and metatranscriptomics, to understand on the effect of horizontal gene transfer in the adaptation of bacteria to multiple environments.

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Name: Paula Helena Reyes Herrera, Bioinformatician
Affiliation: Corpoica

I am a bioinformatician from Politecnico di Torino; I have a background in electronic engineering and a profound interest in biology. I have worked developing computational tools to predict actors involved in post-transcriptional gene regulation (microRNAs and RNA-Binding Proteins). I worked in the Universidad Antonio Nariño as an assistant professor and as PI of a project for CLIP-set data processing. In 2015, I joined Corpoica.

Now I am part of the Vegetal Genebank Team, and I also work in the Genomic Information Platform for cattle breeding. In the Genebank I work implementing an information system and in the genotyping platform to characterize the bank diversity and to associate traits to molecular markers. In the Genomic Information Platform for cattle breeding, I support the bioinformatics for Genomic Selection.



Name: Javier Correa Alvarez,
Affiliation: EAFIT

Javier Correa Alvarez was born in Medellín – Colombia. His formation and researchers have been related with understanding of the molecular genetics of fungus – plant interactions on different plant crops. He began his studies with a bachelor degree in biology sciences at University of Antioquia. Then, he did a master degree in science at the same university and his PhD in Genetic and Molecular Biology at the State University of Campinas, UNICAMP, Sao Paulo - Brazil. During his carrier has published several research articles and chapter book, won the 2009 national award in phytopathology, is advisor of graduate and undergraduate students and principal researcher in genomics projects. Javier's areas of expertise

include bioinformatics, genomics, molecular genetics in microorganism and phytopathology. He speaks Portuguese and English and has lectures in undergraduate courses in Genetics and Bioinformatics for the biology program and courses of Computational Biology for graduate program.

More information:

<https://scholar.google.com/citations?user=hTIEsvYAAAAJ&hl=es>

<http://orcid.org/0000-0001-9009-823X>

<http://www.eafit.edu.co/docentes-investigadores/Paginas/javier-correa-alvarez.aspx>



Name: Juan David Pineda-Cárdenas, Bioinformatician
Affiliation: EAFIT

From 2012 to the present, Juan David is the Technical Coordinator of the Centro de Computación Científica Apolo, at Universidad EAFIT in Medellín, Colombia. He is a computer scientist and Masters degree candidate in Information Security at the Universitat Oberta de Catalunya, Spain.

In addition, he has worked as a teacher in the computer science academic department of Universidad EAFIT in lectures related to technology such as Special Topics in Telematics, Computer Programming, Operating Systems, High Performance Computing, Information Security, among others.

HUMBOLDT



Name: Daniel Lopez, Data Engineering and Software Development Team Leader

Affiliation: Humboldt

Daniel is the leader of the Data Engineering and Software Development Team, a division of the Biodiversity Assessment and Monitoring Program at Humboldt Institute. He joined the Institute in 2013 as the lead software engineer of BioModelos (biomodelos.humboldt.org.co), an open source web application that aims to involve experts in the development of collaborative species distribution models.

Currently, Daniel and his team are developing tools and applications to support the analysis and visualization of Humboldt Institute products as well as the design and implementation of a data architecture and infrastructure to support research needs. Daniel holds a Bachelor's degree in Engineering in Computer Science from Politécnico Gran Colombiano.

IBERS



Name: Narcis Fernandez-Fuentes, Reader in Genomics/Bioinformatics

Affiliation: IBERS

Dr Fernandez-Fuentes received his B.Sc. degree in Biology from the University of Girona in 1997, a B.Sc. degree in Biochemistry from the University Autonomus of Barcelona in 1999 a Ph.D. in Computational Biology from the same university on June 2004. During his Ph.D. he was Marie Curie Fellow at EMBL-EBI at Cambridge, United Kingdom and visiting research at Prof Sternberg's lab at the Imperial College of London, United Kingdom supported by EMBO and FEBS short term fellowships. He was also visiting fellow at Prof Fiser's Lab. Albert Einstein College of Medicine, NY, supported by Boehringer Ingelheim Fonds Fellowship where he moved as Research Associate on 2004.

On September 2007, he was appointed Lecturer at University of Leeds funded by the RCUK Academic Fellow scheme where he established the Computational Biology Lab. From January 2012

is Reader in Bioinformatics at IBERS, Aberystwyth University. Dr Fernandez-Fuentes' research interests lie within the realms of Structural Bioinformatics with a long-standing interest in protein structure prediction, modelling, design, and structure-to-function studies. Dr Fernandez-Fuentes' lab have heavily invested in the study of protein networks from both a functional and therapeutic point of view. On a more applied side, Dr Fernandez-Fuentes' lab work on protein design with the aim of developing novel biocatalysts with application in bio refining.

Finally, Dr Fernandez-Fuentes' research in plant bioinformatics includes the discovery of genes and gene networks associated to drought tolerance using time-course transcriptomics profiling and the annotation of novel draft genomes such rye grass.

JAVERIANA



Name: Alexandra Pomares Quimbaya
Affiliation: Javeriana

NERC



Name: Simon Kerley, Head of Research for Terrestrial Ecosystems
Affiliation: NERC

I am the Natural Environment Research Council's (NERC) Head of Research for Terrestrial Ecosystems. I joined NERC in June 2013 and I am responsible for leading the delivery of NERC strategy within a the terrestrial portion of the NERC remit.

My role is to be a principal interface between NERC and its community, and I am responsible for developing the value-managed relationships with researchers, users and funders in this portfolio. In working with the community and colleagues in NERC, I look to help develop NERC as a science-led organisation, and deliver an integrated portfolio across funding streams.

The Areas of the science remit I cover include soils,

biodiversity, bioinformatics, 'Omics and synthetic biology. I have oversight of programmes including: tree health, tropical forests, insect pollinators, valuing nature, Critical Zone science. I also a link to multi-partner initiatives including Global Food Security.

Previously I worked for BBSRC in the agri-food and then underpinning health areas, and prior to that I was a research scientist in the soil rhizosphere/plant physiology area at Rothamsted, North Wyke and Sheffield.

NIAB



Name: Anyela Valentina Carmargo-Rodriguez
Computational Biologist, Genetics and Breeding,
Affiliation: National Institute of Agricultural Botany (NIAB), Cambridge, UK

I am Systems Engineer and self-thought Biologist who has an interest in developing computational models to describe and predict complex phenomena.

Currently, I have three lines of research. The first one, is concern with designing statistical and mechanistic models to predict crop performance under ideal or challenging production scenarios. I'm currently, I'm developing models to optimise Nitrogen use in Sugarbeet and Babycorn crops in the UK and in England, respectively.

The second line is concern with the development of statistic and mathematical models to explain and predict the onset and co-occurrence of plant diseases. For example, I'm using Machine Learning and

Computer vision methods to assess multi-dimensional data derived from disease and pest trials ran in Brazil and in the UK.

The model assesses the relation between for example Earth Observations, Agroclimatic and Crop management data to explain, and make predictions, about disease outcomes.

The third line of research, is genetic mapping. I use statistical models to identify trait/marker associations under multiple environments. For example, I'm analysing longitudinal data describing growth trajectories of plant area, height, water use and senescence to try to understand trait formation and development. Also to establish when marker-trait associations become and cease to be significant.

RENATA



Name: Luz Miriam Díaz Patigño, Chief Executive Officer, National Academic Network of Advanced Technology
Affiliation: RENATA

Ms. Díaz is an Economist and holds an MBA from the Andes University and a master's degree on Finance from NEOMA Business School. She is an expert on strategic planning, development projects, organizational consultancy, and the formulation, monitoring and evaluation of technical and financial projects for the public and private sectors.

Also, she has served as an adviser to the government as well as private companies in the development of academic projects oriented towards social-corporate management. She has also contributed to the design of administrative, economic and technical mechanisms to aid in the implementation of social projects.

Ms. Díaz has worked as the Chief for the Economic Development of Information Technologies at the Colombian Ministry for Information Technologies and Communications, where she implemented projects and programs while established policies to strengthen the IT industry nationwide.

Since October of 2017, she has taken the role of CEO at the National Academic Network of Advanced Technology, RENATA. There, she is working strategically to consolidate this national network as the main server for the development of collaborative academic and research projects among public and private universities, companies and government institutions that will.



Name: Patricia Jaramillo, PhD in Educational Sciences, IT Engineer
Affiliation: RENATA

Is a PhD in Educational Sciences from the Pontifical Catholic University of Chile and an IT Engineer from Los Andes University (Colombia).

Dr. Jaramillo has great experience in the design, implementation and evaluation of education, innovation and research projects that combine Information Technologies and Communications (ITC) to boost teaching and learning processes. During her career, she has led research projects to identify the role and impact of ITC on elementary and middle school education, college education and educational training. Also, she has worked as a professor and thesis advisor at La Sabana University for the Educational IT master's program, a graduate school program she designed.

Currently, Dr. Jaramillo works as the Chief for the Office of Academic Affairs at the National Academic Network of Advanced Technology, RENATA. There, her goal is to promote RENATA among academic and scientific communities, for it to become an essential tool in the development and execution of projects.

RENATA allows its users to participate in collaborative research; share information, resources and services; and try out new to methodologies and technologies to advance and enhance their projects which will contribute to the country's wellbeing.



Name: Carlos Ramirez, Chief Executive Officer
Affiliation: RENATA

Telecommunication Engineering at Santo Tomás University of Bogotá, since 2011 I work at RENATA Corporation in different positions within the company such as: CLARA Network Systems Operation Group, IPv6 Implementation in State Entities and Higher Education Institutions, Administration of the infrastructure of the RENATA network..

Currently I work as Chief Executive Officer of the Corporation, and i was part of the group of professionals who planned, designed and supported the construction of the new fiber optic network of RENATA



Name: Jorge William Arboleda Valencia, Plant Professor

Affiliation: Universidad de Antioquia

Teacher and Senior Researcher according to the last categorization of COLCIENCIAS; I am currently working as a Plant Professor at the University of Antioquia and recently I have taken on the Scientific Management of the Center for Bioinformatics and Computational Biology of Colombia - BIOS, a leading technological development center that offers robust supercomputing infrastructure and a highly trained staff to carry out activities of research and innovation and that provides services to the government, academia and industry. I have an undergraduate degree in Agronomic Engineering from the University of Caldas, Manizales - Colombia (2000) and a PhD in Basic Sciences with an emphasis in Molecular Biology from the University of Brasilia, Brasilia - Brazil (2011), as well as PosDoc in the Brazilian Agricultural Research Company - EMBRAPA (Brazil) executing the project called "Identification, characterization and bioprospection of molecules em fontes naturais visando potencialis uses in biotechnological processes of economic importance". I have more than 17 years of experience in research, acting mainly in the area of Biotechnology, mainly in the identification and characterization of genes and molecules of biotechnological interest in natural sources, microbial biotechnology, omic sciences, gene prospecting, biological control, bioinformatics, genetic transformation of plants, agroindustry and pharmacology.

In the exercise of my profession I participate in consulting activities, technical assistance, planning,

development and execution of scientific projects, development and innovation, teaching, public policy in science, among others.

This trajectory in the academic, productive and commercial sector has allowed me to acquire valuable experience and managerial skills, reflected in the management of necessary resources for the different research and production processes. Additionally, I have led technical-scientific collaboration agreements of a national and international nature, I participate in the organization of scientific courses. Currently, I teach undergraduate and postgraduate students (Masters and Doctorate) for different institutions, I participate as a teacher and advisor in different undergraduate and postgraduate programs (Masters and Doctorates) at national and international level.

Finally, I lead research projects in partnership with other groups and pairs both in Colombia and abroad, where the duplicity of action and potential of biomolecules from natural, synthetic and data mining sources is studied; within the framework of strategies for the generation of products and processes of economic interest for the academic, agroindustrial and governmental sectors; with the main objective of generating alternative solutions to different problems of human development, through the generation of strategic knowledge, rational use of resources and training of high-level human capital.



Name: Yesid Cuesta Astroz, Researcher and Teacher

Affiliation: Universidad de Antioquia

I graduated in biological sciences from University of Valle (Cali-Colombia) and MSc in biology from University of Antioquia (Medellin-Colombia). I have a PhD in bioinformatics from Federal University of Minas Gerais – Brazil and during my doctoral studies, I was part of the Genomics and Computational Biology Group at FIOCRUZ – Minas (Oswaldo Cruz Foundation), which promotes health and social development through scientific and technological knowledge under the Brazilian Ministry of Health.

Currently, I am involved in research and teaching activities at University of Antioquia. My main focus is the study of host-pathogen interactions from protein diversity to systems biology using computational

biology approaches and integrating different "omics" technologies. I am also involved in the analysis and handling of biological data by working with research groups that specialize in different biological systems and "omics" approaches.

I am a member of the International Society for Computational Biology (ISCB) and the leader of a group of researchers and students (RSG-Colombia; Regional Student Group) which is sponsored by ISCB and the Student Council. The main objective of this network is to create a space of interaction among students and researchers in the field of bioinformatics in order to encourage bioinformatics in Colombia.



Name: Carlos Muskus, Professor
Affiliation: Universidad de Antioquia

Ph.D. in Biomedical Basic Science of the Universidad de Antioquia and MSc in Microbiology and Parasitology of the Universidad del Valle. Currently, I am titular professor at the University of Antioquia and coordinator of the Molecular Biology and Computational Unit of the Program for the Study and Control of Tropical diseases-PECET. The areas of interest are Molecular Biology of parasites, drug discovery applying computational tools and development of molecular diagnostic tests that may be applied at the Point of care.

Under my supervision, I have had, and have graduate students, both doctoral and master students, and also undergraduate students. In the computational biology area I have conducted projects focused on drug discovery by using tools like docking, homology search, artificial intelligence, protein network prediction, and pharmacokinetics and pharmacodynamics. All these works have been conducted with national and international collaborations. Product of these researches, I have published more than 60 articles in international and national journals and also book chapters.



Name: Raúl Ramos Pollan, Professor and researcher
Affiliation: Universidad de Antioquia

Professor and researcher at the University of Antioquia in the areas of Artificial Intelligence and Big Data. Raúl gained his PhD in Computer Engineering from the University of Oporto, Portugal, in the analysis of biomedical images. He has since developed his career in both industry and academia, working as Director of the CETA Computing Center-CIEMAT (Extremadura, Spain, www.ceta-ciemat.es), Software Engineer in the European Center for Particle Physics (www.cern.ch, Geneva, Switzerland), Java Architect for Sun Microsystems Switzerland (www.oracle.com)

and as Cofounder of Pildo Labs (www.pildo.com), an SME in the aeronautics and software sector based in Barcelona.

He moved to Colombia in 2012, initially as a guest researcher at the National University of Colombia in Bogotá in the MindLab group in image analytics, moving to the University Industrial de Santander in 2013, and most recently moved to his current position at the University of Antioquia in 2018.

UNIVERSIDAD DE BOGOTA JORGE TADEO LOZANO



Name: Cesar O. Diaz, Professor
Affiliation: Universidad de Bogotá Jorge Tadeo Lozano

Cesar O. Diaz graduated in Electrical Engineering at Universidad de los Andes in 2001. He got a MSc in Electronic Engineering from Pontificia Universidad Javeriana. He earned his Ph.D. in Computer Science (2014) from the University of Luxembourg in Luxembourg.

Since 2002 he was professor and researcher in different universities in Colombia until 2010, when he started his PhD studies and a contract as Junior researcher in the University of Luxembourg until 2014 then, in 2015,

He did a postdoctoral research in Universidad de los Andes.

He is currently a full professor in Universidad Jorge Tadeo Lozano. His research interests are in Future Generation Computer Systems, IoT, Big Data tools, Distributed Systems, Grid, Green and Cloud Computing, Energy-efficient scheduling, load balancers, and resource allocation on cloud computing.

UNIVERSIDAD DE CUNDINAMARCA



Name: Nelson E. Arenas Suárez
Affiliation: Universidad de Cundinamarca

Professor Nelson Enrique Arenas Suarez received his B.S. in Biology and environmental education from Universidad del Quindío in 2004, where he was an undergraduate researcher with Professor Arley Gomez and was first introduced to the field of molecular microbiology. He moved to Bogota, to perform his master degree at Universidad Nacional in 2009 with professor Carlos Yesid Soto in the field of tuberculosis. Prof. Arenas received his PhD in Biochemistry and molecular biology from the University of Southern Denmark under the supervision of Prof. Stephen Douthwaite (2011-2015). His Ph.D. project dealt with the molecular basis of antibiotic hypersensitivity in *Escherichia coli* and mechanisms associated with the bacterial response to some bacteriostatic antibiotics, which indicate the regulatory pathways and cellular components that are activated in response to drug challenges by combining genome sequencing, mass spectrometry, quantitative PCR and flow cytometry. Then, he moved back to Colombia and was a consultant for the Department of Research and development at Universidad de Cundinamarca. He is currently assistant professor at the Faculty of

Agricultural Sciences in Universidad de Cundinamarca. Prof. Arenas' interest has focused on studying determinants of antibiotic resistance in zoonotic pathogens which affect the animal production in the Sumapaz region. One longstanding main interest is in understanding the molecular basis of antibiotic resistance and susceptibility by using comparative genomics, proteomics and biochemical techniques. Lastly, Prof. Arenas has expertise in techniques based on DNA hybridization including spoligotyping and IS6110-RFLP and diagnostic assays such as IS6110-PCR used for tuberculosis typing and diagnosis respectively.

https://www.researchgate.net/profile/Nelson_Arenas_Suarez
<https://orcid.org/0000-0002-7665-8955>

UNIVERSIDAD CATÓLICA



Name: Diego Alberto Rincón Yáñez
Affiliation: Universidad Católica

Currently Computer Science Researcher and Professor, with industry experience as an IT Architect. Worked as CTO the Colombian National Research and Education Network - RENATA and The Director of architecture in CAOBA, the Colombian Center of Excellence in Big Data and Data Analytics, 10 years of experience overall, significant involvement in education, as an university professor and working

for state agents of the "Sistema Nacional de Ciencia, Tecnología e Innovación SNCTI" (National System of Science, Technology and innovation), emphasizing 6+ years in direction, planning, and mission critical service construction, making technology policies in organizations.

UNIVERSIDAD DE LOS ANDES



Name: Marco Cristancho
Affiliation: Universidad de los Andes

Marco Cristancho is a research associate at Universidad de los Andes in Bogotá, Colombia. Previously, he was the scientific director at the Colombian Bioinformatics and Computational Biology Center – BIOS and a principal investigator at the Coffee Research Center – Cenicafé.

Marco completed his B.Sc. in Microbiology at Universidad de los Andes and his Ph.D at The University of Manchester. He was engaged in two Post-Doctoral research assignments at Cornell University.

He has more than 25 years of experience working on plant-pathogen interactions and plant pathogens management strategies and epidemiology. Additionally,

Marco has also over 15 years working on genomics and bioinformatics and has contributed with over 50 publications in international peer-reviewed journals, 3 books, and 7 book chapters. He has been a consultant for rust management strategies to Central America countries and he has ongoing collaborative research projects with several groups in Coffee Genomics.

He has led numerous grants conceded by NSF, Latin American and international science sponsor agencies and is currently co-coordinator of CABANA, a GCRF-UK funded project that is led by a consortium of nine Latin American organizations and EBI in the UK and which has as a major goal the strengthening of bioinformatics in the region.

UNIVERSIDAD DE LOS LLANOS

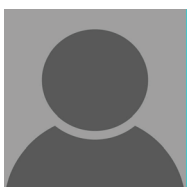


Name: Thomas Viloría Lagares
Affiliation: Universidad de los Llanos

Thomas, Is from San Andres Islands, Colombia. He is a herpetologist and molecular ecologist researcher with Master degree in conservation and genetics. Thomas received his Bachelor's degree and his master degree from the Universidad Nacional de Colombia, in 2009 and 2017 respectively. During his postgraduate research, he assessed the phylogeography, sustainable harvest, and management of populations of American Crocodile in Colombia. His research interests also include spatial ecology, management, and conservation biology of reptiles.

Thomas has seven years experience working on research projects related to conservation and molecular ecology and eight years teaching water resources, marine biology, natural resources and environmental management in technical schools. He is author of the ongoing management plan for conservation of reptiles and amphibians in Seaflower Biosphere Reserve.

UNIVERSIDAD NACIONAL DE COLOMBIA



Name: Andres M Pinzon Velasco
Affiliation: Universidad Nacional de Colombia



Name: Camilo Alejandro Corchuelo Rodriguez

Affiliation: Universidad Santo Tomas

Camilo is a strategist and ICT leader oriented to innovation in knowledge management in education institutions and information units. He has completed a Masters in Educational Computer Science, Librarianship and Systems Technology. Camilo has extensive experience in project management in information systems, creation of strategies, policies and ICT guidelines in educational institutions. Design and implementation of innovation processes in information services using ICT.

He is currently a researcher in the areas of Digital Culture, Digital Competence, Gamification, Scientometrics, Knowledge Management and Scientometrics., as well as a lecturer and speaker at national and international events, teacher and academic advisor.

SWOT Analysis guidance

Below are some examples of the sorts of things to consider when completing a SWOT analysis:

INTERNAL FACTORS	
STRENGTHS(+)	WEAKNESSES(-)
<p>What advantages do you have? What do you do better than anyone else? What unique or lowest-cost resources can you draw upon that others can't? What do people see as your strengths? What is your Unique Selling Proposition (USP)?</p> <p>Consider your strengths from both an internal perspective, and from the point of view of your competitors.</p>	<p>How could you improve? What should you avoid? What are people likely to see as weaknesses? Do you suffer from a lack of resources?</p> <p>Consider this from an internal and external perspective: Do other people seem to perceive weaknesses that you don't see? Why are your competitors doing any better than you? In identifying weaknesses, be honest and realistic as it will help you develop resilience and efficiency.</p>
EXTERNAL FACTORS	

OPPORTUNITIES(+)	THREATS(-)
<p>What changes can you identify that could herald new prospects? What interesting trends are you aware of e.g. changes in social patterns, government policy, population profiles, economic/ financial situations, lifestyles trends? Are there any milestones/ dates/ events coming up that you could take advantage of?</p> <p>When looking at opportunities look at your strengths and ask yourself whether these open up any opportunities. Alternatively, look at your weaknesses and ask yourself whether you could open up opportunities by eliminating them.</p>	<p>What obstacles do you face? Is the lack of time a problem? Is security an issue for you? What are your competitors doing? Are quality standards, regulations or government policy preventing your progress? Is global competition changing your sector?</p> <p>When looking at opportunities and threats, PEST Analysis can help to ensure that you don't overlook external factors: Political, Economic, Socio-cultural, Technological.</p>

SWOT Analysis template

Please try to provide **at least 3 entries per box**

INTERNAL FACTORS	
STRENGTHS(+)	WEAKNESSES(-)

EXTERNAL FACTORS	
OPPORTUNITIES(+)	THREATS(-)

Mission and Vision statement

Having worked out your Strengths, Weaknesses, Opportunities and Threats, now is the time to concretely define your mission and vision for the key themes/topics.

To help you with this we have provided definitions for both vision and mission statements, and a few broad ranging examples of phrases to help get you started.

Vision

A Vision statement is forward looking. It defines the position that that you are ultimately trying to get to and how you want others to perceive it. It should be inspirational and aspirational and typically defines where you want to be some time in the next 5 to 10 years.

Examples:

'To be recognised as world-leader in ...'

'To be respected for our contribution ...'

'To advise on [policy]'

Mission

A mission statement, on the other hand, tells people what you are doing today to try to get to that ultimate vision. It's the who and how to progressing to that future state.

Examples:

'To contribute to the growth and sustainability ...'

'... provide [audience] with the tools and training necessary for job excellence and career advancement.'

'Challenge colleagues and collaborators to improve ...'

Words like 'Accelerate', 'Advance' or 'Champion' work well to start mission statements.



Mission statement

Vision statement

Notes



Notes



List of Workshop Organisers and Delegates

Juan Manuel Anzola	UdeA & CorpoGen	Delegate
Jorge William Arboleda Valencia	BIOS	Delegate
Nelson E. Arenas Suarez	U de Cundinamarca	Delegate
Emiliano Barreto-Hernández	UNAL	Organiser
Luis Calzadilla	British Council Bogota	Delegate
Anyela Valentina Camargo-Rodriguez	NIAB	Delegate
Alejandro Caro	Corpoica	Delegate
Camilo A. Corchuelo Rodriguez	U Santo Tomas	Delegate
Javier Correa	EAFIT, Proyecto BioHUB	Delegate
Marco A Cristancho Ardila	Uniandes	Delegate
Yesid Cuesta Astroz	UdeA	Delegate
Rob Davey	Earlham Institute	Organiser
Jose De Vega	Earlham Institute	Organiser
Federica Di Palma	Earlham Institute	Organiser
Luz Miriam Díaz Patigño	RENATA	Delegate
Jorge Duitama	Uniandes	Organiser
Graham Etherington	Earlham Institute	Organiser
Narcis Fernandez	IBERS	Delegate
Anestis Gkanogiannis	CIAT	Delegate
Romain Guyot	Cenicafe & IRD.fr	Delegate
Patricia Jaramillo	RENATA	Delegate
Daniel Lopez	Humboldt	Delegate
Simon Kerley	NERC	Delegate
Juan Pablo Mallarino	Uniandes	Delegate
Julio Marin	Corpoica	Delegate
Alice Minotto	Earlham Institute	Organiser
Dany Molina	BIOS	Delegate
Leroy Mwanzia	CIAT	Delegate
Monica Munoz	Berkley	Organiser
Carlos Muskus	UdeA	Delegate
Cesar Orlando	UTadeo	Delegate
Juan David Pineda	EAFIT	Delegate
Andres M Pinzon Velasco	UNAL	Delegate
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Paula Reyes	Corpoica	Delegate
John Jaime Riascos	Cenicana	Delegate
Diego A. Rincon	UCatolica	Delegate
Claudia Tinjaca	Colciencias	Delegate
Thomas Viloria Lagares	U de los Llanos	Delegate

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