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## Enabling the genomic revolution in Africa:

### H3Africa is developing capacity for health-related genomics research in Africa

#### The H3Africa Consortium<sup>\*,†</sup>

<sup>\*</sup>H3Africa Consortium research investigators, funding agencies, and institutions appear in the supplementary materials

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Our understanding of genome biology, genomics, and disease, and even human history, has advanced tremendously with the completion of the Human Genome Project. Technological advances coupled with significant cost reductions in genomic research have yielded novel insights into disease etiology, diagnosis, and therapy for some of the world's most intractable and devastating diseases—including malaria, HIV/AIDS, tuberculosis, cancer, and diabetes. Yet, despite the burden of infectious diseases and, more recently, noncommunicable diseases (NCDs) in Africa, Africans have only participated minimally in genomics research. Of the thousands of genome-wide association studies (GWASs) that have been conducted globally, only seven (for HIV susceptibility, malaria, tuberculosis, and podoconiosis) have been conducted exclusively on African participants; four others (for prostate cancer, obsessive compulsive disorder, and anthropometry) included some African participants ([www.genome.gov/gwastudies/](http://www.genome.gov/gwastudies/)). As discussed in 2011 ([www.h3africa.org](http://www.h3africa.org)), if the dearth of genomics research involving Africans persists, the potential health and economic benefits emanating from genomic science may elude an entire continent.

The lack of large-scale genomics studies in Africa is the result of many deep-seated issues, including a shortage of African scientists with genomic research expertise, lack of biomedical research infrastructure, limited computational expertise and resources, lack of adequate support for biomedical research by African governments, and the participation of many African scientists in collaborative research at no more than the level of sample collection. Overcoming these limitations will, in part, depend on African scientists acquiring the expertise and facilities necessary to lead high-quality genomics research aimed at understanding health problems relevant to African populations and to become internationally competitive in genomic science and its applications.

In June 2010, the U.S. National Institutes of Health (NIH) and UK-based Wellcome Trust, in partnership with the African Society of Human Genetics, announced a plan to enhance the ability of African scientists to apply genomic and epidemiological approaches to shed light on the determinants of chronic and infectious diseases in Africa (1). The Human Heredity and Health in Africa (H3Africa) initiative, now funded at \$76 million over 5 years, is

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SUPPLEMENTARY MATERIALS

[www.sciencemag.org/content/344/6190/1346/suppl/DC1](http://www.sciencemag.org/content/344/6190/1346/suppl/DC1)

focused on capacity building, as well as specific scientific goals. H3Africa research grants are awarded directly to African institutions where principal investigators are based (table S1), which allows African scientists to develop and direct their independent research agendas. The program encourages formation of intra-continental collaborations and development of specific infrastructural elements, i.e., African-based biorepositories and a pan-African bioinformatics network (H3ABio-Net). H3Africa also includes training programs aimed at retaining African scientists on the continent to help build a sustainable critical mass of researchers. Open calls for research proposals have emphasized collaborations within Africa, plus accessible biorepositories and a bioinformatics network with nodes across the continent (table S2). The footprint of H3Africa extends across Africa (see the map), comprising 21 grants (table S1). It is anticipated that, together, H3Africa projects will analyze samples from 50,000 to 75,000 participants.



H3Africa is predicated on the belief that diseases and nonmedical issues relevant to Africans can be best explored in partnership with inhabitants of Africa (both researchers and research participants) who can provide a rich context and deep knowledge of the continent's past and present environment. African genomes and the unique genetic structure of African populations harbor many clues to understanding human evolutionary history which, in turn, can help shed light on disease etiology. For example, recent genomic studies showed that African Americans (AA) with chronic kidney disease (CKD) who harbor risk variants of the apolipoprotein L1 gene (*APOL1*) have a risk for accelerated CKD progression and the development of end-stage renal disease, that is two to five times normal, respectively (2, 3). These variants also confer 29 times the risk of HIV-associated nephropathy (HIVAN) (4). Despite these renal outcomes, the prevalence of the risk genotype is 13% among AA and virtually absent among those of non-African ancestry. The prevailing hypothesis is that *APOL1* renal risk variants evolved in sub-Saharan Africa about 10,000 years ago to confer protection against the regionally endemic trypanosome parasite, the cause of African sleeping sickness. Recent studies led by African scientists showed that the frequency of the risk variants, as well as the prevalence of CKD and HIVAN in carriers of the risk variant,

are much higher in West Africa (Yoruba, 28%; Igbo, 23%; the major ancestral populations of AA) where the trypanosome parasite is endemic as compared with the non-endemic region of Ethiopia (~1%) (5–7). The association between CKD and *APOL1* [a component of high-density lipoprotein (HDL) cholesterol] is shedding light on the complicated protective relation between HDL cholesterol and CKD in global populations (8). In another example, African scientists participating in H3Africa have used genomic tools to understand how genes interact with life style (barefoot farming practices) to increase susceptibility to podoconiosis, a neglected tropical disease in Ethiopia and Cameroon (9).

A key challenge to building critical mass for genomic research in Africa is the retention of scientific leadership capable of developing and maintaining sustainable research programs. The dearth of research-intensive institutions on the continent, coupled with a shortage of funded positions, continues to drive Africa's talented scientists to countries where they have better opportunities to develop their potential and pursue their interests. Furthermore, the African continent lacks a strong history of collaborative scientific endeavor (10), as African researchers have turned to their well-resourced counterparts from Europe, North America, and Asia, rather than to their neighbors, to achieve scientific excellence and strong publication records. Consequently, African scientists have not adequately developed the necessary infrastructure and large-scale biomedical research culture required to promote research in Africa. H3Africa has begun building a strong foundation for genomic research based on collaboration among African scientists. Perhaps more important, H3Africa is facilitating the implementation of the norms and standards for project oversight, goal orientation, and timely dissemination of discoveries and training of the next generation of biomedical researchers across Africa. The consortium is also addressing the use of standardized protocols with detailed attention to community engagement and ethics approval (see below), protocols and policies for sharing biospecimens and data, and publication policies for large collaborative groups.

Approaches to these issues are facilitated by frequent interactions among consortium members to share experiences in developing genomic research programs, to support and promote interactions among the collaborative projects, and to jointly tackle ethical and policy concerns. An important example is data harmonization. By standardizing phenotype measurement and how collected responses are coded to facilitate data merging, statistical power for discovery of genetic variants and for modeling gene-by-environment interactions can be greatly increased.

Implementation of multinational and multiinstitutional genomics research projects in Africa faces additional challenges. Many local ethics review committees have little experience in genomic studies that require broad consent for long-term storage and sharing of biospecimens and data, and some have balked at the concept of global sharing of biospecimens and data with no immediate local benefit, viewing it as another form of exploitation. Several African countries have restrictive legislative policies that hamper sharing across national boundaries. Cultural beliefs and practices regarding donating any body part, including blood, need to be addressed. The growing international debate about return of individual genomic results is also an issue in Africa (11). Finally, there are huge disparities across Africa that span rural communities adhering to long-established cultural

beliefs and practices on the one hand to sophisticated “citizens of the world” residing in major cities on the other. These communities share genetic heritage, but require different approaches to engagement and informed consent. Thus, H3Africa includes a grant program that supports empirical research on innovative approaches to informed consent; community engagement; and the ethical, legal, social, and cultural factors unique to the African research environment.

The H3Africa Consortium has developed an approach that attempts to balance (i) protection of the ability of African scientists to be the first to analyze and publish findings about their main research questions, given their limited resources and capacity to deal with data as quickly as scientists in developed countries with (ii) the benefit of global access to H3Africa data and biospecimens. To reach these not completely compatible ends, the H3Africa Consortium has agreed that data will be made initially available to the consortium members via H3ABioNet until submission to the European Genome-phenome Archive, from which they will be publicly accessible (through an independent Data and Biospecimen Access Committee). As is common in genomics, there will be a short lag (12 months) between data submission and publication; this is somewhat longer than the norm (6 to 9 months) to provide resource-challenged African investigators a bit more time to analyze and submit their manuscripts for peer review.

Similar considerations went into development of the policy for the release of biospecimens collected in H3Africa. The biospecimens will be stored in an African biorepository (with backup elsewhere on the continent), and from there shared globally for further research. Data and biospecimen sharing does, however, raise the often contentious issues of ownership and commercialization rights. The H3Africa Consortium is addressing this issue while embracing an ethos that promotes research for the global common good. Resources generated by H3Africa are expected to be useful in future genomic research not only in Africa but also globally.

H3ABioNet has also embarked on a program of training and accreditation of its bio-informatics nodes to carry out specific data analysis techniques, i.e., of GWAS or next-generation sequencing data. Part of the training involves a series of workshops, often held at the nodes, to prepare for an accreditation exercise. The accreditation involves giving the nodes raw data sets to analyze, with their results being assessed by an international accreditation committee. One of the major challenges in holding training courses or even just joining working-group Skype calls, is poor Internet connectivity. H3ABioNet is using creative approaches to overcome these issues by seeking low latency alternatives and using portable devices that host data and tools and run independently of the network.

There are several criteria for success that have been defined to assess the accomplishments of the H3Africa initiative (see the table). Each of the component grants has a set of specific, yearly milestones, progress toward which is assessed on an annual basis by the funders (with input from an Independent Experts Committee of outside scientists. Both Wellcome Trust and the NIH will also critically evaluate the progress of H3Africa through peer review toward the end of the initial funding period. Accomplishments of both individual grants and

the overall program will be considered in each funder decision process to determine whether continued support is justified.

The efforts of the African scientific community and their international colleagues will not in themselves be sufficient. It is essential that national governments and regional political and economic organizations support sustained funding of all research fields, including genomics and research infrastructure development. In fact, H3Africa has been useful in leveraging additional funding from local sources, as demonstrated by support from the South African Department of Science and Technology to enhance data collection in an H3Africa project of cardiometabolic disease genomics, an early promise of potential long-term success.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## References

1. Nature. 2010; 465:990.
2. Genovese G, et al. Science. 2010; 329:841. [PubMed: 20647424]
3. Parsa A, et al. N Engl J Med. 2013; 369:2183. [PubMed: 24206458]
4. Kopp JB, et al. J Am Soc Nephrol. 2011; 22:2129. [PubMed: 21997394]
5. Behar DM, et al. Am J Nephrol. 2011; 34:452. [PubMed: 21968148]
6. Ulasi II, et al. Nephron Clin Pract. 2013; 123:123. [PubMed: 23860441]
7. Tayo BO, et al. Int Urol Nephrol. 2013; 45:485. [PubMed: 22956460]
8. Bentley AR, et al. Int J Nephrol. 2012; 2012:748984. [PubMed: 22973513]
9. Tekola Ayele F, et al. N Engl J Med. 2012; 366:1200. [PubMed: 22455414]
10. De Vré, R., et al. McKinsey Quarterly Report. McKinsey & Co; Washington, DC: Jun. 2010  
Closing the R&D gap in African health care.
11. Rotimi CN, Marshall PA. Genome Med. 2010; 2:20. [PubMed: 20346094]

**Measures of success for the 5-year H3Africa program**

Publication in high-impact journals with African lead and senior authors

Increased availability of funding for biomedical and genomics research in Africa

Effective operation of a pan-African bioinformatics network

Regular data release

Establishment of one or more full-scale biorepositories

Effective release of samples within and outside of the African continent

Contribution to the ongoing efforts to reverse African “brain drain”

Extension of funding for a second 5 years

<b>Project Member Surname</b>	<b>First name</b>
<b>Collaborative Centers</b>	
<b>African Center for Microbiome and Genomics</b>	
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Bakare	Rasheed
Akarolo-Anthony	Sally
Obe	Eileen
Goesbeck	Parham
<b>H3Kidney</b>	
Adu	Dwomoa
Ojo	Akinlolu
Yewondwossen	Mengistu Tadase,
Gbadegesin,	Rasheed
Plange-Rhule,	Jacob
Cooper,	Richard
Tayo,	Bamidele
Arogundade	Fatiu
Ajayi	Samuel
Osafo,	Charlotte
Amodu	Olukemi
Salako,	Tunde
Olanrewaju,	Timothy
Burke,	David
Mc'Ligeyo,	S.O.
Ulasi,	Ifeoma
Parekh,	Rulan
Mamven,	Manmak
Boima,	Vincent
Ekem,	Ivy
Mate-Kole,	Michael
Nyarko,	Alexander
Ademola	Adebowale
Boehnke	Micheal
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Hilderbrandt,	Friedhelm
Kretzler,	Matthias
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Pollak	Martin
Adabayeri	Victoria May
Kopp	Jeffrey
Winkler	Cheryl
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Anabwani	Gabriel
Kekitiinwa	Adeodata
Joloba	Moses

Nkomazana	Oathokwa
Mpoloka	"Wata" Sununguko
Mardon	Graeme
Brown	Chester
Hanchard	Neil
Kasvosve	Ishmael
Kyobe	Samuel
Marape	Marape
Nsangi	Betty
Tsimako-Johnstone	Masego
Wayengera	Misaki
Tukei	Vincent

**Stroke Investigative Research & Educational**

Owolabi	Mayowa
Ovbiagele	Bruce
Lackland	Daniel
Jenkins	Carolyn
Akinyemi	Rufus
Arulogun	Omoyisola
Obiakor	Reginald
Owolabi	Lukman
Akpalu	Albert
Sagoe	Kwamena
Sarfo	Stephen

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Sankoh	Osman
Agongo	Godfred
Alberts	Marianne
Carstens	Nadia
Crowther	Nigel
Gomez-Olive	Xavier
Hazelhurst	Scott
Kahn	Kathleen
Kyobutungji	Catherine
Lombard	Zane
Norris	Shane

Oduro	Abraham
Soodyall	Himla
Sorgho	Hermann
Tinto	Halidou
Tollman	Stephen
Wade	Alisha

### Research Projects

#### RAFAgene: Contribution of genetic variation

Affolabi	Dissou
Wachinou	Ablo Prudence
Sow Bah	Oumou
Sarr	Marie
Mthiyane	Thuli
McIlleron	Helen
Owen	Andrew

Merle	Corinne
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#### Systems Biology for Molecular Analysis of T

Ameni	Gobena
Pieper	Rembert

#### Host and Microbial Genetic Determinants of

Happi	Christian
Sabeti	Pardis
Garry	Robert
Folarin	Onikepe
Kahn	Sheik Humarr
Grant	Donald
Asogun	Danny
Tobin	Ekaete
Ndiaye	Daouda
Yozwiak	Nathan
Jiang	Pan-Pan
Baniecki	Mary-Lynn
Winnicki	Sarah
Andersen	Kristian G.
Tareila	Andrew

#### Clinical and genetic studies of hereditary ne

Landouré	Guida
Traoré	Mahamadou
Samassékou	Oumar
Fischbeck	Kenneth
Kleta	Robert

Burnett	Barrington
<b>The nasopharyngeal microbiome and respira</b>	
Nicol	Mark
Zar	Heather
Mulder	Nicola
<b>Reprogramming of the Trypanosoma brucei</b>	
Patterton	Hugh
<b>Genomics of Schizophrenia in the South African</b>	
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Ramesar	Raj (Prof.)
Alonso Betancourt	Orlando (Prof.)
Nagdee	Mo (Prof.)
Susser	Ezra (Prof.)
King	Mary-Claire (Prof.)
Lehner	Thomas (Dr.)
<b>ELSI Research Projects</b>	
<b>Exploring Perspectives on Genomics and Si</b>	
Wonkam	Ambroise
Makani	Julie
Ohene-Frempong	Kwaku
<b>Mc Curdy</b>	Sheryl
Treadwell	Marsha
<b>Tangwa</b>	Godfred
<b>de Vries</b>	Jantina
<b>Ofori Aquah</b>	Solomon
<b>Pilot Biorepository Projects</b>	
<b>NHLS Stellenbosch University Biobank -</b>	
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Swanepoel	Carmen
Grewal	Ravnit
van Rooyen	Beverley
Christoffels	Alan
Fakunle	Eyitayo
<b>IHVN H3 African Biorespository (I-HAB) Initia</b>	
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Croxtan	Talishiea
<b>Establishment of an H3Africa Biorepository</b>	
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Reddy	Shiksha
Kader	Mukthar
<b>Integrated Biorepository of H3Africa Uganda - II</b>	
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Ain Shams University, Egypt
Malawi-Liverpool-Wellcome Clinical Research Programme / Institute of Infecti
Malawi-Liverpool-Wellcome Clinical Research Programme / College of Medici
National Center for Supercomputing Applications and Institute for Genomic Bi
Botswana Harvard AIDS Institute Partnership, Botswana
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#### **Drug tuberculosis treatment in Sub-Saharan Africa**

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Principal investigator	Yes	
Principal investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	

Overall Principal investigator	Yes	
Overall Co-Principal Investigator	Yes	
Co - Investigator	Yes	Phenomics core C
Co - Investigator	Yes	Community Engag
Site and Core Principal Investigator	Yes	
Co-Investigator	Yes	Community Engag
Site Principal Investigator	Yes	
Site Principal Investigator	Yes	
Site and Core Principal Investigator	Yes	
Co - Investigator	Yes	Bioinformatics Co
Site Principal Investigator	Yes	

Principal investigator	Yes	
Co- Principal Investigator	Yes	
Project Coordinator/Manager for Centre - Navrongo, Ghana - involved in the development of centre specific protocols from the beginning	Yes	
Centre PI for Dikgale, South Africa	Yes	
Biorepository Users WG, drafting of sample sharing policy	Yes	
Phenotype Standards WG, metabolic disease expert	Yes	
Project Coordinator/Manager for Agincourt, South Africa - involved in the development of centre specific protocols and harmonization with other projects	Yes	
Senior Scientist: Bioinformaticist Lead PI Wits node of BioNet. Wrote part of the proposal and is developing the data management processes for AWI-Gen and H3A and is node PI for BioNet	Yes	
Co-PI Agincourt SA, Board member INDEPTH	Yes	
Centre PI & Project Coordinator - Nairobi, Kenya	Yes	
Genome Analysis WG co-chair, genomics expertise	Yes	
Centre PI for Soweto, expertise in phenotyping/ultrasound/epidemiology	Yes	

Centre PI - Navrongo, Ghana	Yes	
Ethics & Regulatory Issues WG, population genetics/genomics expertise. On the ethics WG and key contributor to policies	Yes	
Project Coordinator/Manager - Nanoro, Burkina Faso - - involved in the development of centre specific protocols from the beginning	Yes	
Centre PI, Nanoro, Burkina Faso	Yes	
Centre PI, Agincourt, SA	Yes	
Phenotype Standard WG, Questionnaire and measurement advisor - - involved in the development of centre specific protocols from the beginning	Yes	

Principal investigator	Yes	
Co-Principal Investigator	Yes	
Site Principal Investigator	Yes	
Site Principal Investigator	Yes	
Site Principal Investigator	Yes	
Co-Principal Investigator	Yes	
Co-Principal Investigator	Yes	
Co-Principal Investigator	yes	Major contribution of the conceptual development of the research project

Principal investigator	Yes	
Co-principal investigator	Yes	

Principal investigator	Yes	
Co-investigator	Yes	
Co-investigator	Yes	
Research scientist	Yes	
Medical Director	Yes	
Medical Officer	Yes	
Medical Director	Yes	
Medical Director	Yes	
Research scientist	Yes	
Project Manager	Yes	
Data Manager	Yes	
Research scientist	Yes	
Research scientist	Yes	
Research scientist	Yes	
Research assistant	Yes	

Principal investigator	Yes	
co-Investigator/Cytogeneticist	Yes	Key to the project
co-Investigator/Geneticist	Yes	Key to project imp
co-Investigator/Consultant clinician/Genetician	Yes	Key to project imp
co-Investigator/Geneticist	Yes	Key to project imp

co-Investigator/Biochemist	Yes	Key to project imp
Principal investigator	Yes	
Co-Principal investigator	Yes	
Co-Principal investigator	Yes	
Principal investigator	Yes	
Principal investigator	Yes	
Co-PI	Yes	
<i>Site-PI</i>	Yes, pending ethical approval from Walte	
<i>Site-PI</i>	Yes, pending ethical approval from Rhode	
Principal investigator	Yes	
PI, geneticist	Yes	
PI	Yes	
Principal investigator	Yes	
Co-PI	Yes	
<i>Co-PI</i>	Yes	
<i>Co-PI</i>	Yes	
Co-PI	Yes	
Co-PI	Yes	
Major collaborator	Yes	
Major collaborator	Yes	
Principal investigator	Yes	
Co-investigator, Operational manager	Yes	
Co-investigator, haematopathologist	Yes	
Research scientist, biorepository technical operations	Yes	
Collaborator, Bioinformatics support	Yes	
Collaborator, iPSC and Room Temperature Storage studies.	Yes	
Principal investigator	Yes	

Consultant	Yes	Played a significant
Manager	Yes	Played a significant
Principal investigator	Yes	
Operation and Technical Advisor	Yes	
Project Manager	Yes	
Principal investigator	Yes	
Co-Investigator	Yes	
Co-Investigator/Coordinator	Yes	
Collaborator/Consultant	Yes	



Principal investigator	Partial	Yes
Co-PI	Nil	Yes
PI	Partial	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Partial	Yes
Co-PI	Nil	Yes
PI	Partial (20%)	Yes
PI	Funded fully	Yes
Co-PI	Funded fully	Yes
PI	Partial	Yes
Co-PI	Partial	Yes
PI	Nil	Yes
PI	Partial	Yes
PI	Partial	Yes
Co-PI	Partial	Yes
PI	Partial	Yes
Co-PI	Partial	Yes
PI	Partial	Yes
Co-PI	Partial	Yes
PI	Partial	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Partial	Yes
PI	Nil	Yes
PI	Partial	Yes
Co-PI	Partial	Yes
Co-PI	Nil	Yes
PI		20% Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Partial	Yes
PI	Partial	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Nil	Yes
PI	Nil	Yes

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Nil  
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Yes  
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Yes





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Bucheton	Bruno	IRD, France
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Enyaru	John	Makerere University, Uganda
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Koffi	Mathurin	Universite Jean L Guede, Cote d'Ivoire
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Sidibe	Issa	CIRDES, Burkina faso
Simo	Gustave	University of Dschang, Cameroon
Simuunza	Martin	University of Zambia
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