

An overlook of Personalized Medicine in West Africa



**EU-AFRICA PerMed 1st Stakeholder
Workshop**

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IRESSEF**

**BUILDING LINKS BETWEEN
EUROPE AND AFRICA IN
PERSONALISED MEDICINE**



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Personalized Medicine (PM) in West-Africa

PM dates back of many decades but still not well-known in West Africa.

Growing knowledge interest of Human Genetics that is changing prevention, diagnosis and treatment to many pathologies.

Impressive recent progress over the recent past but still lots of works to do in the sub-region.

AAS and NEPAD working for redirection of resources and game-changing approaches to improve public health in the continent.

Tailoring of care (*prevention, diagnosis & treatment*) to individual characteristics & preference, and, detailed characterization of African genetic diversity are needed.

West Africa economic zone

- A community of 15 countries

[Benin](#), [Burkina Faso](#), [Cabo Verde](#), Ivory Coast,
[Gambie](#), [Ghana](#), [Guinee](#), [Guinee-Bissau](#), [Liberia](#),
[Mali](#), [Niger](#), [Nigeria](#), [Senegal](#), [Sierra Leone](#), and [Togo](#)

- 220 million inhabitants
- Regional GDP of 106.7 billion USD

ECOWAS/WAHO countries

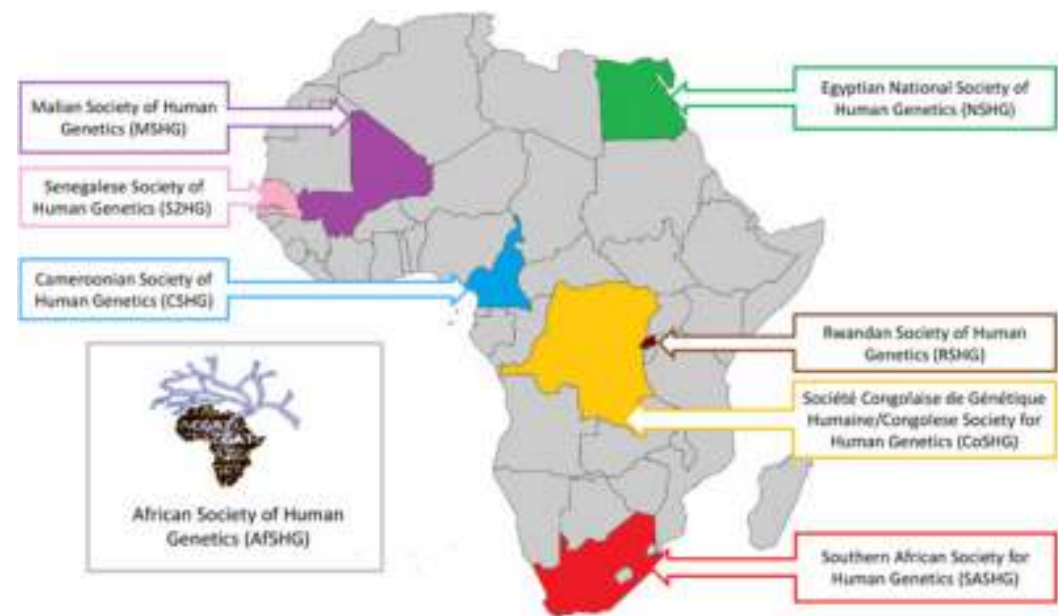


Rapid changing landscape with Personalized Medicine in Africa

The new medicine (OMICS) now introduced in most of countries, admittedly to varying degrees.

Leadership role of the Human Heredity and Health in Africa (H3Africa).

Limitations: Lack of adequate infrastructures and equipment, few skilled specialists, limited experience, isolated collaborations, no or little regulations/ethical considerations, etc.



Changing landscape with PM in West Africa

There is still a huge gap in PM compared to the northern countries.

Better characterize the African Genome - bring to light the genetic diversity of the African population - and foster genomics of infectious diseases.

Pool efforts/potential for strong and capable centers of excellence to enable PM.

Make the concept of personalized medicine better known to political decision-makers and other key stakeholders in medical research in West Africa.

Better integrate PM into the health system agenda.

Research Institutions in West Africa

Selected centers of Excellence in Genomics In West Africa:

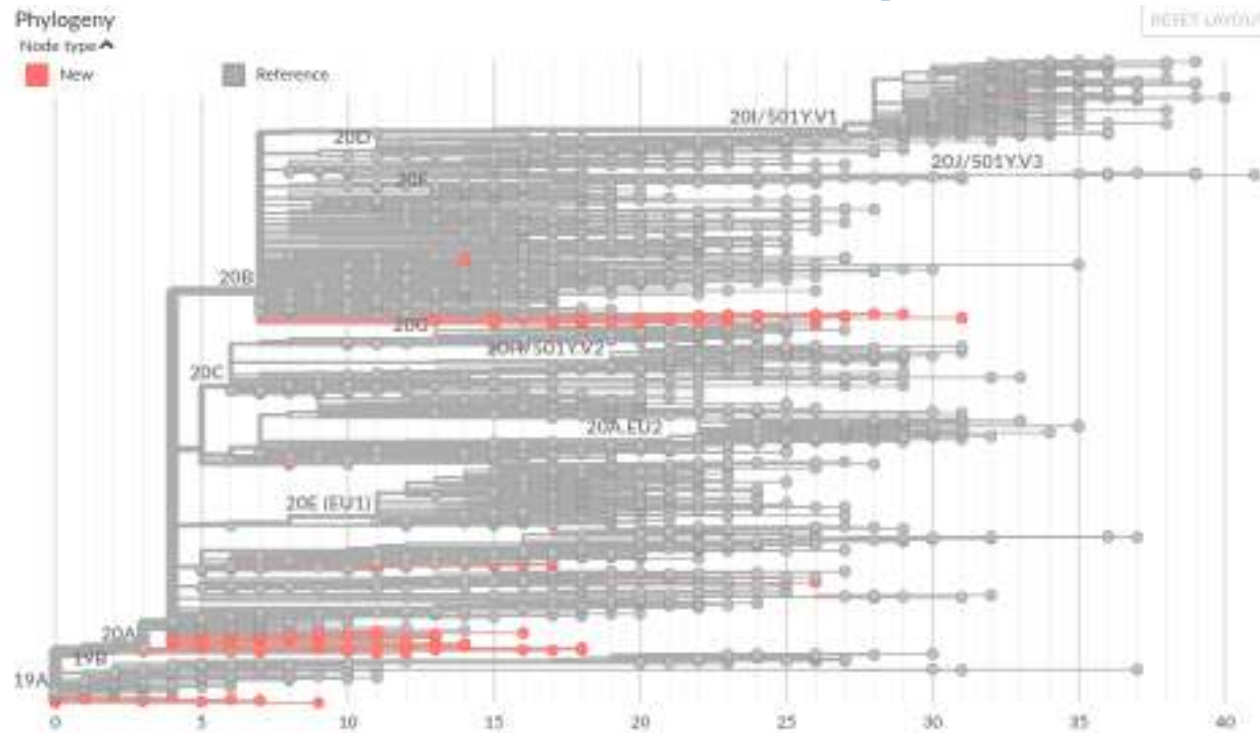
- H3Africa Consortium
 - ACEGID, Nigeria
 - MRC/LSHTM, The Gambia
 - Pathogens genomic Diversity Network Africa, Mali
 - IRESSEF, Senegal
 - Centre International de Recherche et de Formation sur les Agents Infectieux et le Génomique (CRF-AG), Senegal.
 - Etc.
- **Why?** To understand and control transmission of infectious diseases in West Africa to save lives and protect an already fragile health system and foster Human Genomics in the continent.
 - **How?** By establishing networks of collaborations with laboratories, academic & public health institutions to advance outbreak surveillance and research in W. Africa.
 - **What?** Generate and analyze the genomic diversity in Pathogens and also in Human and its impact on health and susceptibility to disease..

IRESSEF engaged in developing Human & infectious diseases Genomics Platforms



EU + Africa
PerMed

Phylogenetic tree of Senegalese's Covid-19 samples



258 sequences realized at IRESSEF Genomics' platform within 2 months in using Minlon with 2 new variant detected.

Recent publications / IRESSEF

scientific reports

EDITORIAL

First detection of SARS-CoV-2 variant B.1.1.7 in Senegal

A. Padane^{1,2}, A. Karzoh¹, N. Leye¹, A. Mboup¹, J. Haneeth¹, H. Mbaw¹, P. A. Diaw¹, B. P. Ndjaye¹, G. Lo¹, C. I. Lo¹, A. Ahoudi¹, A. Gueye-Gaye¹, J. J. N. Maloum¹, A. Dia¹, Y. A. Dia¹, N. D. Diagne¹, D. Wade¹, A. K. Sissay¹, N. C. Traore-Kane¹, U. Dalessandro² and S. Mboup¹

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Keywords: Africa, british variant, COVID-19, per
Original Submission: 13 March 2021 | **Revised Article published online:** 8 April 2021

KEYWORD: COVID-19

COVID-19 in Africa: Dampening the storm

The dampened course of COVID-19 in Africa might reveal innovative solutions

S. Moushata-Milouf¹, B. B. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹, S. S. Sissou¹

depending on the number of deaths, the national and regional economic and socio-demographic context in the countries involved

group in the continent. The findings are significant for, and I believe in, the future of Africa.

Research paper doi: <https://doi.org/10.1186/s12916-021-01444-4>; this version posted July 4, 2021. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted medRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY-NC-ND 4.0 International license.



The projected impact of mitigation and suppression strategies on the COVID-19 epidemic in Senegal: A modelling study

Hayley A Thompson¹, Aminata Mboup², Badara Cisse^{1,4}, Shevanti Nayagam^{1,3}, Oliver J Watson¹, Charles Whittaker¹, Patrick G T Walker¹, Zara C Ghani^{1*}, Souleymane Mboup²

With the Imperial College COVID-19 Response Team

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Short communication

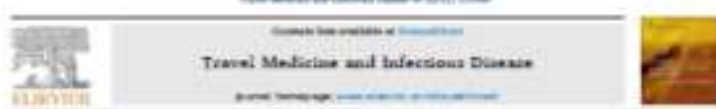
Implementation of an in-house real-time reverse transcription-PCR assay for the rapid detection of the SARS-CoV-2 Marseille-4 variant

Marielle Bedotto¹, Pierre-Edouard Fournier^{1,2,3}, Linda Houhamdi⁴, Anthony Levasseur^{1,3}, Jeremy Delerce⁵, Lucile Pinault⁶, Abdou Padane⁷, Amanda Chamieh^{1,2,3}, Hervé Tissot-Dupont⁴, Philippe Brouqui^{1,3}, Cheikh Sokhna^{1,2}, Eid Azar⁸, Rachid Salle⁹, Souleymane Mboup⁷, Idir Bitam³, Philippe Colson^{1,3}, Didier Raoult^{1,2,3,4}



Original introduction variant

Philippe C Van Thuan Abdou Pa Mariem B Jean-Christophe Didier Raoult



Original article

Introduction into the Marseille geographical area of a mild SARS-CoV-2 variant originating from sub-Saharan Africa: An investigational study

Philippe Colson^{1,2,3}, Anthony Levasseur^{1,2,3}, Philippe Gantier^{1,2}, Florence Pinault^{1,2}, Van Thuan Houng^{1,2,3}, Jeremy Delerce^{1,2}, Idir Bitam³, Rachid Salle⁴, Mariam Mouton^{1,2}, Abdou Padane^{1,2}, Marielle Bedotto^{1,2}, Lucile Pinault^{1,2}, Vincent Bous^{1,2}, Mariem Ben Khedja^{1,2}, Hervé Tissot-Dupont^{1,2,3}, Matthieu Milon^{1,2}, Hervé Tissot-Dupont^{1,2}, Jean-Christophe Leglet^{1,2}, Souleymane Mboup⁷, Pierre-Edouard Fournier^{1,2,3,4}, Didier Raoult^{1,2,3,4}

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ARTICLE INFO

ABSTRACT

Background: In Senegal, Senegal, the COVID-19 epidemic evolved differently with several distinctive features.





Thank you for your attention



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