Promoting cancer genomics research in Africa: a roadmap

Folakemi T. Odedina & Solomon Rotimi

Cancer genomics research in Africa is crucial to understanding the genetic architecture of cancer and tailoring cancer diagnoses and therapies to African populations. Creating this research enterprise in Africa has to be purposeful with a roadmap that incorporates individual scientist-, international collaborator-, university or institution-, and scientific organization-level factors.

Morbidity and mortality from non-communicable diseases, such as cancer, will surpass that of communicable diseases in Africa by 2030 (ref.1). Alarmingly, Africa leads other continents in terms of the predicted percent changes of cancer incidence and mortality from 2020 to 2040, with an expected increase of 92.9% for cancer mortality and 89.1% for new cancer cases2. Cancer continues to create a huge clinical, economic and humanistic burden for Africa as a continent. To effectively address the disproportionate burden of cancer in Africa, we must understand what drives the development and growth of different types of cancer in African populations. The field of cancer genomics holds the promise to study the genetic architecture of cancer and develop new tools to diagnose and treat cancer in Africa. Unfortunately, individuals of African origin constitute less than 3% of study participants in genome-wide association studies (GWAS)3 although Africa has the most diverse human populations, accounting for 17% of the global population. Genetically, Africa is home to five (East Africans, West Africans, Central African Hunter-Gatherers, Northern Khoe-San and Nouthern Khoe-San) out of the six distinct groups in the human population structure, with the sixth representing all the out-of-Africa populations4. Hence, the limited representation of African populations in cancer genomics research (CGR) continues to contribute to global cancer disparities due to the lack of understanding of the biology of cancer in African populations5,6. Out of over 700,000 cancer genetics or genomics studies in PubMed, less than 500 utilized African biospecimens. For these African cancer genetics studies, GWAS or genome sequencing studies were mainly on populations in North African countries and South Africa; hence, many African populations are not represented6.