

Commentary

Strengthening Brain Research in Africa

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Abstract. This paper explores the emerging field of neuroscience in Africa, considering the unique genetic diversity, socio-cultural determinants, and health inequalities in the continent. It presents numerous brain research initiatives, such as ABDRN, AMARI, APCDR, and H3Africa, aimed at understanding genetic and environmental factors influencing brain disorders in Africa. Despite numerous challenges like the brain drain phenomenon, inadequate infrastructure, and scarce research expertise, significant progress has been achieved. The paper proposes solutions, including international collaboration, capacity-building efforts, and policies to promote neuroscience research, to enhance the understanding of brain function and address brain-related health issues within the African context.

Keywords: Africa, Alzheimer's disease, brain drain, brain research, collaboration, global partnerships, health inequities, infrastructure, neuroscience, research capacity

The burgeoning field of brain research in Africa reflects the increasing awareness of the importance of studying the human brain in its diverse global contexts. Historically, most brain research has been conducted in Western nations due to their access to resources and advanced technologies [1]. However, this has led to a significant gap in our understanding of the brain's functionality in non-Western populations, including those within Africa. This gap presents both an opportunity and a necessity for fostering cultur-

ally responsive neuroscience, which acknowledges and addresses the varied neurobiological and socio-cultural factors impacting brain function and health [1–3]. In contemporary times, diverse African nations have witnessed the emergence of numerous undertakings and scholarly endeavors aimed at exploring various facets of neuroscience [2, 3]. The initiatives strive to tackle the unique obstacles and prospects that arise from the African milieu, encompassing heterogeneous genetic lineages including variants such as Apolipoprotein E (*APOE*), cultural determinants, and healthcare inequalities [4–6].

APOE has been associated with varying risks of Alzheimer's disease and other dementias. This specific genetic factor provides an exemplary illustration

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of the potential for improved understanding of brain function and disease within the African context. The genetic diversity present in Africa, which includes unique distributions and variants of *APOE*, could provide key insights into the role of genetic factors in Alzheimer's disease and other neurological conditions [6]. This diversity, when studied alongside the region's unique lifestyle and environmental factors, has the potential to enhance our understanding of these conditions and improve global health outcomes.

Several brain research initiatives have been undertaken in Africa; a few examples are discussed. First is the African Brain Disorders Research Network (ABDRN), a pan-African initiative aimed at exploring the genetic and environmental determinants underlying brain disorders in Africa [7]. The initiative fosters cooperative research endeavors between African scientists and global collaborators to enhance neurological and psychiatric disorders' comprehension, diagnosis, and management. The African Mental Health Research Initiative (AMARI) is another example; they are a collaborative endeavor between African and international researchers focusing on mental health [7]. The objective is to produce empirical data that can enhance mental health policies and interventions in Africa by examining diverse factors, such as genetic, social, and cultural determinants of mental illness.

The African Partnership for Chronic Disease Research (APCDR) is an initiative exploring Africa's determinants and burdens of chronic disease [8]. Although its scope is not exclusively limited to brain research, the APCDR's focus encompasses conditions that impact the brain, such as stroke, epilepsy, and neurodegenerative diseases. The Institute of Cognitive Neuroscience at the University of Nigeria is dedicated to studying cognitive neuroscience, with a particular emphasis on investigating the neural mechanisms underlying information processing and cognitive functions unique to African populations [8]. The researchers investigate various subjects, including but not limited to language processing, perception, attention, and memory. The H3Africa Initiative is a collaborative endeavor that involves several African nations and focuses on human heredity and health in Africa [8]. Although not exclusively centered on neuroscience, the objective is to employ genomics to comprehend the genetic foundation of illnesses that are widespread in Africa, such as neurological disorders, and to establish customized healthcare strategies for African communities.

The instances indicate the increasing attention and financial resources being directed towards the field of neuroscience throughout the African continent [7]. These endeavors enhance the development of indigenous research capabilities, produce data pertinent to African demographics, and cultivate partnerships with global counterparts. The scientists' objective is to enhance our comprehension of brain function, recognize the risk factors of neurological disorders, and create interventions that consider Africa's specific context [9].

The phenomenon of brain drain is observed in Africa, where proficient researchers and scientists tend to migrate to foreign countries in pursuit of enhanced research prospects and resources [10]. The phenomenon of brain drain has resulted in a depletion of local expertise, which is essential for advancing brain research in the continent [10]. More collaboration and networking must be needed to exchange knowledge, expertise, and resources, which are crucial for achieving common goals [11].

There is a need for highly intensive research capacity and expertise to ensure the advancement of brain research. Therefore, it is essential to cultivate and enhance research capacity to promote progress in this field. Numerous African nations encounter a dearth of proficient researchers, restricted availability of specialized training programs, and inadequate mentorship prospects, thereby impeding the development of expertise in the domain [12]. Brain research requires meticulous attention to ethical principles and cultural diversity. Pursuing research advancement while upholding cultural values and beliefs can present difficulties, particularly in cases where the research pertains to delicate subject matter or involves human participants.

The acquisition and availability of comprehensive and high-quality data are paramount in neuroscience. Africa encounters several obstacles in data collection, storage, and dissemination, such as insufficient data infrastructure, restricted data-sharing policies, and apprehensions regarding data privacy [12]. Promoting public awareness regarding brain research is crucial in securing funding, overcoming stigma, and gaining support. The progress of brain research in Africa may be impeded by a dearth of awareness and comprehension regarding its significance [13].

Overcoming these obstacles necessitates a collective approach involving governmental bodies, academic establishments, financial sponsors, and global collaborators. To advance brain research in Africa, investing in infrastructure, increasing funding

opportunities, promoting collaboration, and strengthening research capacity are recommended [13]. By prioritizing brain research, Africa has the potential to make substantial progress in comprehending and tackling neurological disorders, cognitive health, and brain-related conditions that impact its populace.

One strategy to enhance research capacity in Africa is to establish collaborative partnerships between African research institutions and international organizations, universities, and research centers. The facilitation of knowledge exchange, access to funding, and shared resources can enhance the capacity of African researchers to conduct advanced brain research; This suggests augmenting the financial support for brain research by governmental bodies, private foundations, and international funding agencies [13]. Sufficient financial resources can facilitate the development of research infrastructure, facilitate the education of researchers, and furnish the necessary resources for data acquisition, analysis, and dissemination [13, 14].

This to improve the training and capacity-building initiatives in neuroscience and its associated fields. Also, it can be achieved by making alliances with established research institutions, providing scholarships, fellowships, and workshops to African researchers and students, and instituting mentorship programs to foster the development of the upcoming cohort of African neuroscientists [13]. The utilization of networks can foster cooperation, streamline the exchange of information, and establish a forum for collaborative research initiatives [14].

The promotion of open data sharing and collaborative efforts among researchers is recommended. The utilization of this approach has the potential to expedite scientific breakthroughs, promote the reproduction of results, and streamline comprehensive analyses encompassing a wide range of African populations. Translational research aims to facilitate the conversion of research discoveries into tangible applications that can positively impact society. Facilitating collaborations between researchers and industry, alongside promoting entrepreneurship in the field of neuroscience, has the potential to facilitate the translation of scientific breakthroughs into targeted diagnostics, therapies, and interventions that cater to the unique requirements of African populations [15].

Advocacy for policy support should promote policies prioritizing the advancement of brain research and the dissemination of neuroscience education. It is imperative to involve local, national, and regional policymakers to establish brain health as a public

health priority and to secure sufficient resources for research and interventions [16]. This is to establish sustainable research ecosystems in Africa by promoting local leadership, enhancing institutional support, and cultivating a scientific inquiry and innovation culture focusing on long-term sustainability. This measure could facilitate the sustained development and prosperity of African neuroscience research. By implementing these strategies, the African continent can enhance its brain research capacity, promote scientific knowledge advancement, and make valuable contributions to worldwide endeavors aimed at comprehending and tackling brain-related issues.

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CONFLICT OF INTEREST

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