

Aligning Medical Biochemistry Research with Sustainable Development Goals: A Path to Health and Equity

Introduction

The United Nations Sustainable Development Goals (SDGs) have set a global framework for addressing pressing issues ranging from poverty to climate change, with a strong focus on improving health and well-being (SDG 3). As the scientific community works toward innovations in medicine and health care, the role of medical biochemistry is becoming increasingly critical in achieving these objectives. In this editorial, we explore the importance of aligning research in medical biochemistry with the SDGs and highlight how this alignment can accelerate advancements in health care, equity, and sustainable development.

Global Relevance and Urgency

The SDGs, especially SDG 3: Good Health and Well-being, underscore the importance of ensuring healthy lives for all, at all ages. In a rapidly evolving world marked by climate change, population growth, and global pandemics, the pursuit of solutions that not only improve health outcomes but also promote environmental sustainability has never been more urgent. Medical biochemistry, with its capacity to uncover molecular mechanisms of diseases, improves diagnostics, develops novel therapies, and plays a pivotal role in achieving these goals.

By integrating the SDGs into the research agenda, scientists can focus on sustainable health innovations that address both local and global health challenges. For example, the rising burden of noncommunicable diseases (NCDs) like diabetes and cardiovascular diseases in India is compounded by environmental factors such as pollution and water quality—challenges directly linked to other SDGs, such as Clean Water and Sanitation (SDG 6) and Climate Action (SDG 13).

Promoting Interdisciplinary Collaboration

SDGs inherently encourage collaboration across disciplines. Medical biochemistry is no exception, and the intersection of biochemistry with environmental health, nutrition, and public health, opens opportunities for interdisciplinary research that drives sustainable development. For example, biochemical research on antioxidant responses in the body can inform broader studies on pollution-related diseases, linking health outcomes with environmental factors.

Such collaboration is crucial in addressing complex health issues like antimicrobial resistance (AMR), which requires not just biochemical insights into resistance mechanisms, but also public health interventions, policy regulations, and environmental safeguards.

Addressing Health Disparities in India

India, with its diverse population and widespread health inequalities, offers a unique context for SDG-driven research. Health disparities remain significant, especially in rural and underprivileged communities. Medical biochemistry research aligned with SDG 3 can contribute to affordable diagnostics, targeted treatments, and preventive strategies that address these disparities. By focusing on genetic predispositions, biomarkers of disease, and cost-effective interventions, biochemists can help bridge the gap between cutting-edge science and healthcare access for marginalized populations.

Moreover, the integration of SDG 2: Zero Hunger in medical biochemistry research, through studies on malnutrition-related disorders and nutrient deficiencies, can address the nutritional challenges that disproportionately affect low-income populations.

Aligning National Policies with Research

India's ambitious healthcare programs, such as Ayushman Bharat, aim to provide universal health care and address the health care needs of its vast population. Aligning medical biochemistry research with the SDGs ensures that innovations in diagnostics, treatment, and prevention are in sync with the policy priorities of the country. For instance, research on biochemical markers for early disease detection can directly inform the expansion of preventive health care under the national health policy.

Furthermore, collaboration with international bodies and alignment with SDG targets will enable Indian researchers to contribute to global health solutions, enhancing India's leadership in areas like vaccine development, infectious disease management, and public health innovations.

Ethical Responsibility of the Scientific Community

The ethical dimension of research cannot be overlooked. As global citizens, scientists hold a responsibility to ensure that their research contributes positively to society. Aligning medical biochemistry research with the SDGs represents a conscious effort to address global challenges, ensuring that scientific advancements do not occur in isolation but have real-world applications that improve health outcomes and foster sustainable development.

Research that is disconnected from these broader goals risks overlooking the systemic issues that drive disease and health inequity. The ethical imperative is clear: as medical biochemists, we must use our knowledge and resources to contribute to the achievement of the SDGs, ensuring that we leave no one behind.

Potential for Funding and Support

Research that aligns with the SDGs also has the potential to attract greater funding and institutional support. Global organizations, including the World Health Organization (WHO), Bill & Melinda Gates Foundation, and United Nations Development Programme (UNDP), prioritize initiatives that contribute directly to sustainable development. Indian researchers who integrate SDG principles into their work may find new opportunities for collaborations and funding from these international organizations.

Conclusion

Aligning medical biochemistry research with the Sustainable Development Goals is not just an option—it is an essential strategy for ensuring that scientific advancements translate into equitable healthcare solutions. The SDGs provide a roadmap for achieving a healthier, more sustainable future, and the field of medical biochemistry holds the key to unlocking many of the innovations necessary to achieve these targets. As we move forward, it is crucial that our research efforts focus on promoting global health equity, addressing environmental challenges, and supporting the development of sustainable healthcare systems. By doing so, medical biochemistry can make significant contributions to the betterment of society and the achievement of sustainable development in India and beyond.

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