# INSTITUTE OF CHILD HEALTH

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**Director: PROF. OLUKEMI K. AMODU**




September 18, 2025

The Chief Executive
National Agency for Science and Engineering Infrastructure (NASENI)
Idu Industry Layout,
PMB 391 Garki, Abuja

Dear Sir,

**LETTER OF INTENT THE "CHITINOSAN: SHELLS TO WEALTH" PROJECT**

I am writing to formally express my intent to apply for the NASENI Research and Innovation Grant with the proposal titled: The "CHITINOSAN: Shells to Wealth" Project.

The proposed research seeks to leverage indigenous biological resources for industrial advancement. Chitosan, a biodegradable, biocompatible, and non-toxic polymer, has growing applications across medicine, agriculture, food technology, and environmental management. Yet, Nigeria currently depends heavily on imports, a challenge that increases production costs, limits accessibility, and constrains innovation. This project seeks to address these challenges by using the West African river prawn (*Macrobrachium vollenhovenii*) and the American cockroach (*Periplaneta americana*) as sustainable raw materials for chitosan production while reducing processing time, enhancing yield, and purity improvement relative to conventional methods.

A core component of this research is the design and fabrication of scalable semi-automated extraction equipment, developed with locally sourced materials and computer-aided design tools. The system will integrate microcontrollers, PLCs, and sensors to achieve up to 80% automation, thereby minimizing human effort, improving process control, and enabling industrial scalability.

By integrating **resource valorization with process innovation and equipment automation**, this project will deliver high-quality, industrial-grade chitosan while strengthening Nigeria's capacity for biotechnology, advancing **waste-to-wealth conversion,** and driving the **national bioeconomy agenda.**
I am confident that this proposal aligns closely with NASENI's mandate to promote indigenous innovation, industrial self-sufficiency, and the transformation of Nigeria's natural resources into drivers of socio-economic growth. With your support, this project will not only reduce dependency on imports but also position Nigeria as a key player in the global chitosan market projected to reach $15.1 billion by 2030.

Sincerely,

Olukemi K Amodu PhD
Professor of Genetics/Biotechnology and Public Health