PITCH DECK PRESENTATION

ON

A NOVEL RECOMBINANT TICK VACCINE (JUTVAC-NG) FOR AN INTERGRATED CONTROL OF TICKS IN WEST AFRICA

PROFESSOR GONI ABRAHAM DOGO

(Inventor)

BRIEF

One of the major stumbling blocks in the development of anti-tick vaccines, as with other anti-parasite vaccines, is the identification of effective antigens (Willadsen 2008).

In this project, a systematic and pragmatic approach to express the BM86 **protein for the development of a novel recombinant tick vaccine for an integrated control of ticks and infectious pathogens they transmit from livestock to humans in Nigeria is being proposed.**

This was inspired when, cattle vaccinated with crude extracts of the infesting ticks resulted in a reduction in the tick burden.

In addition, the team has modelled the efficacy of the TICKGARD VACCINE in the Nigerian ticks and have gone further to practically characterized the BM86 genes in Nigeria (Dogo *et al.*, 2010).

BRIEF PROJECT BACKGROUND CONTD.

- Efforts in tick vaccine research and development have been made in the western world, but complimentary efforts have been lacking in Africa.
- Dispite its high relevance to the livestock industry until recently, significant immunogenic BM86 gene were isolated, sequenced and characterized from Nigerian pathogenic ticks.
- *Boophilus annulatus, Boophilus decoloratus* and *Hyalomma truncatum* in central part of Nigeria, Dogo *et al,* 2015.
- The BM86 gene sequences have been allotted accession numbers as **KF670599, KF670600 and KF670601** respectively and deposited in the GenBank of national centre for biotechnology information (NCBI) which will be retrieved and used as the starting material for this project.

PROJECT OBJECTIVES

- General objectives:

1. Improve animal health.
2. Increase livestock production thereby ensuring food security.
3. Promote innovative technologies in vaccine development.
4. Advance collaboration in research and development.
5. Boost economic prosperity of the nation

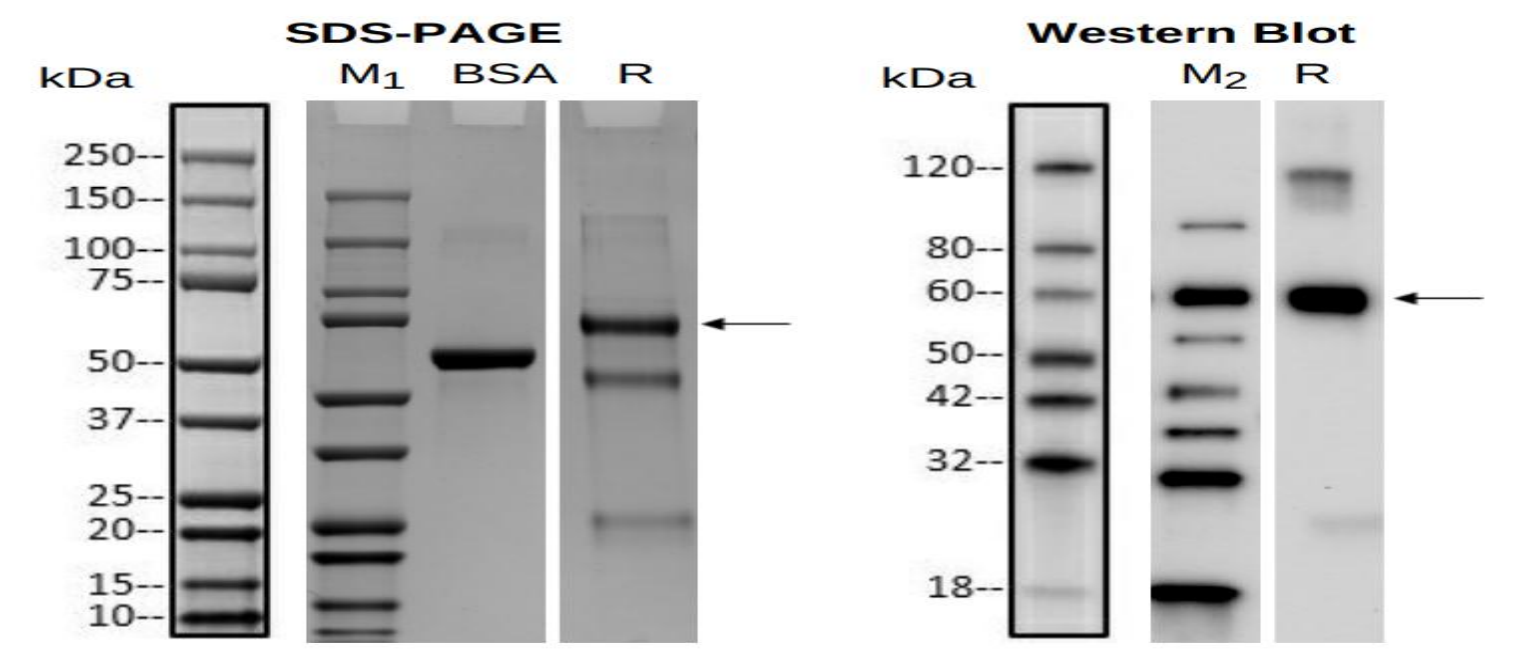
- # Protein Sequence

PROTEIN LENGTH = 654

MW = 72990.5 PREDICTED PI = 6.82

MLLVNQSHQGFNKEHTSKMVSAIVLYVLLAAAAHSAFAESSICSDFGNEFCRNAECEVVPGAEDDFVC
KCPRDNMYFNAAEKQCEYKDTCKTRECSYGRCVESNPSKGSCVCEASDDLTLQCKIKKDFATDCRNR
GGTAKLRTDGFIGATCDCGEWGAMNKTTRNCVPTTCLRPDLTCKDLCEKNLLQRDSRCCQGWNTANC
SAAPPADSYCSPGSPKGPDGQCKNACRTKEAGFVCKHGCRSTDKAYECTCPSGFTVAEDGITCKSISYT
VSCTVEQKQTCRPTEDCRVQKGTVLCECPWNQHLVGDTCISDCVDKKCHEEFMDCGVYMNRQSCYC
PWKSRKPGPNVNINECLLNEYYYTVSFTPNISFDSDHCKRYEDRVLEAIRTSIGKEVFKVEILNCTQDIK
ARLIAEKPLSKYVLRKLQACEHPIGEWCMMYPKLLIKKNSATEIEEENLCDSLLKNQEAAYKGQNKCV
KVDNLFWFQCADGYTTTYEMTRGRLRRSVCKAGVSCNENEQLECANKGQICVYENGKANCQCPPDT
KPGEIGCIERTTCNPKEIQECQDKKLECVYKNHKAECKCPDDHECSRQPAKDSCSEEDNGKCQSSGQR
CVMENGKAVCKEKSEATTAATTTTKA KDKDPDPGKSSLEHHHHHH**

- **SDS-PAGE & western blot analysis:**



•Lane M1: protein marker, Bio-rad, Cat. No. 1610374S, refer to annotated key on the left for size

•Lane M2: protein marker, GenScript, Cat. No. M00673, refer to annotated key on the left for size

•BSA: 2.00 μg

•R: reducing condition

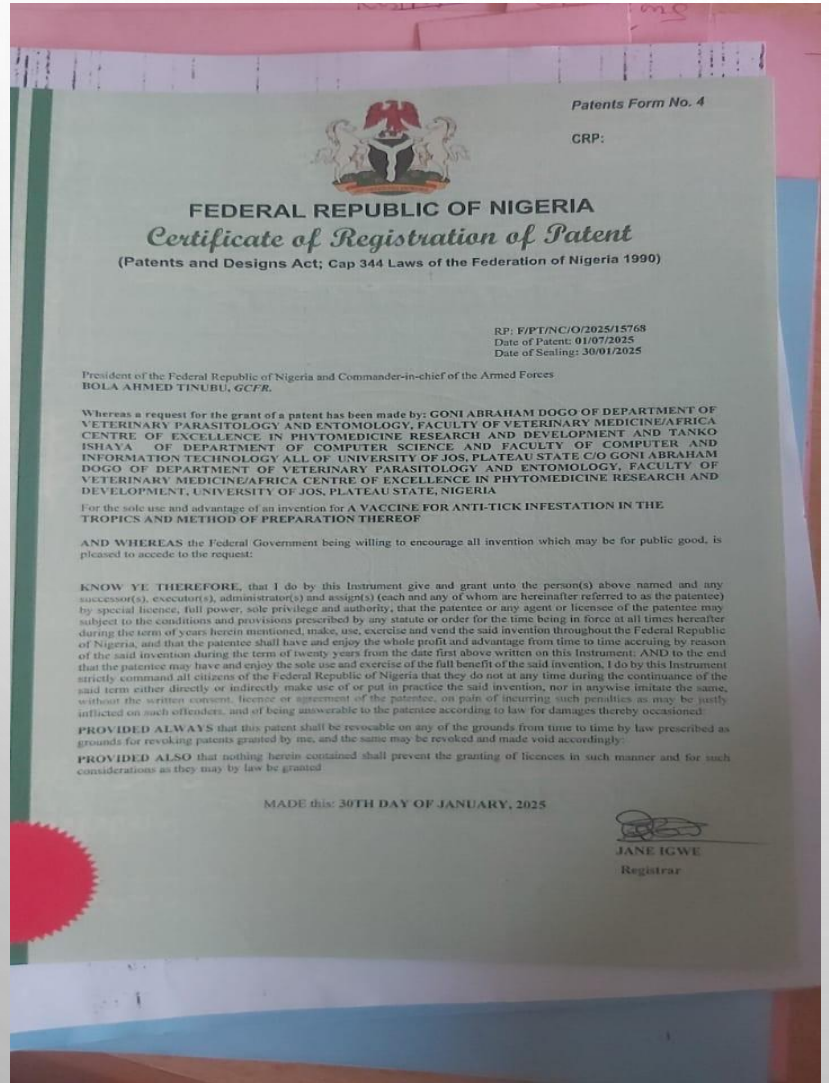
•Primary antibody: mouse-anti-his mab (GenScript, cat. No. A00186)

VACCINE FORMULATION AT NVRI-VOM.

- **Procurement, assembling of materials and development of SOP Cont'd.**
  - ✓ **Material for vaccine formulation at NVRI-Vom (objective 5) has been fully paid for, supplied and sop fully developed**
  - ✓ **Material for vaccine quality control and quality assurance (objective 6) has been fully paid for, supplied and SOP fully developed**
  - ✓ **Material to conduct in-vitro assessment of the novel vaccine in mice (objective 7) has been fully paid for, 80% supplied and SOP fully developed.**
- **Ticks' collection and rearing**
  - ✓ **Ticks' collection and rearing has been fully completed.**

- **THE ANTI-TICK VACCINES**

PATENT REGISTRATION CERTIFICATE



Patents Form No. 4

CRP:

FEDERAL REPUBLIC OF NIGERIA

Certificate of Registration of Patent

(Patents and Designs Act; Cap 344 Laws of the Federation of Nigeria 1990)

RP: F/PT/NC/O/2025/15768
Date of Patent: 01/07/2025
Date of Sealing: 30/01/2025

President of the Federal Republic of Nigeria and Commander-in-chief of the Armed Forces
BOLA AHMED TINUBU, *GCFR.*

Whereas a request for the grant of a patent has been made by: GONI ABRAHAM DOGO OF DEPARTMENT OF VETERINARY PARASITOLOGY AND ENTOMOLOGY, FACULTY OF VETERINARY MEDICINE/AFRICA CENTRE OF EXCELLENCE IN PHYTOMEDICINE RESEARCH AND DEVELOPMENT AND TANKO ISHAYA OF DEPARTMENT OF COMPUTER SCIENCE AND FACULTY OF COMPUTER AND INFORMATION TECHNOLOGY ALL OF UNIVERSITY OF JOS, PLATEAU STATE C/O GONI ABRAHAM DOGO OF DEPARTMENT OF VETERINARY PARASITOLOGY AND ENTOMOLOGY, FACULTY OF VETERINARY MEDICINE/AFRICA CENTRE OF EXCELLENCE IN PHYTOMEDICINE RESEARCH AND DEVELOPMENT, UNIVERSITY OF JOS, PLATEAU STATE, NIGERIA

For the sole use and advantage of an invention for **A VACCINE FOR ANTI-TICK INFESTATION IN THE TROPICS AND METHOD OF PREPARATION THEREOF**

AND WHEREAS the Federal Government being willing to encourage all invention which may be for public good, is pleased to accede to the request:

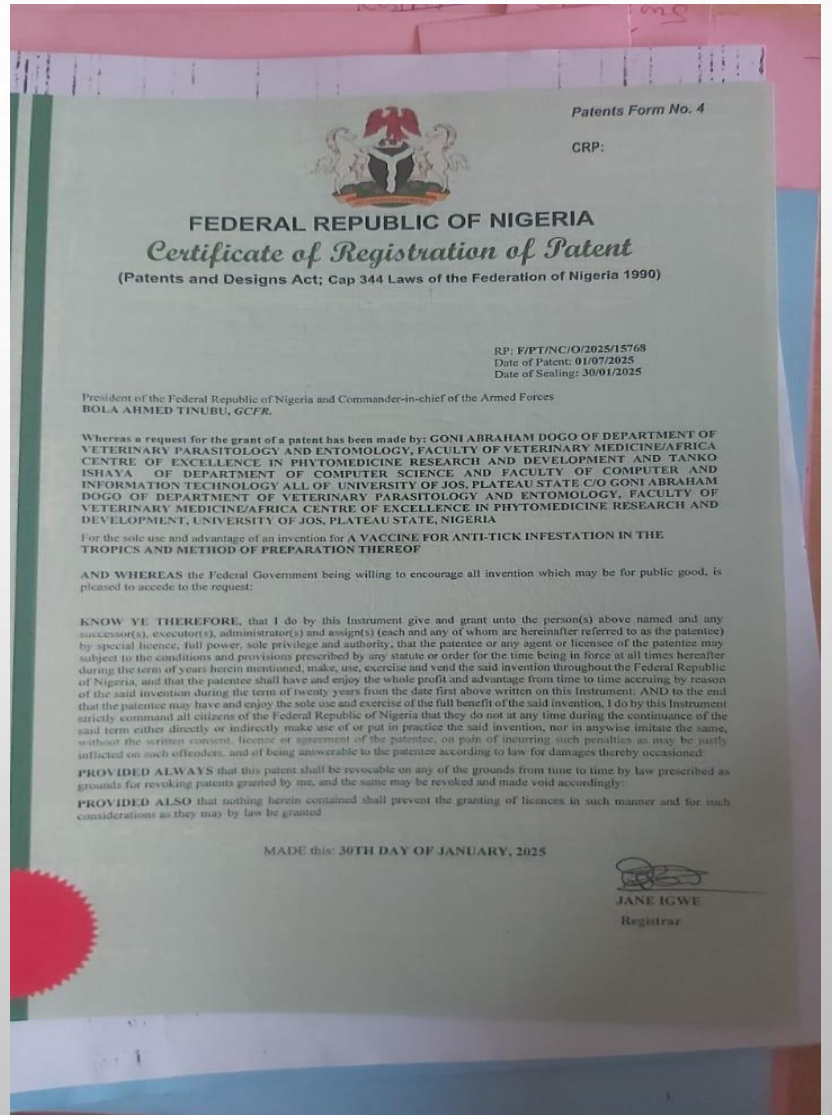
KNOW YE THEREFORE, that I do by this Instrument give and grant unto the person(s) above named and any successor(s), executor(s), administrator(s) and assign(s) (each and any of whom are hereinafter referred to as the patentee) by special licence, full power, sole privilege and authority, that the patentee or any agent or licensee of the patentee may subject to the conditions and provisions prescribed by any statute or order for the time being in force at all times hereafter during the term of years herein mentioned, make, use, exercise and vend the said invention throughout the Federal Republic of Nigeria, and that the patentee shall have and enjoy the whole profit and advantage from time to time accruing by reason of the said invention during the term of twenty years from the date first above written on this Instrument: AND to the end that the patentee may have and enjoy the sole use and exercise of the full benefit of the said invention, I do by this Instrument strictly command all citizens of the Federal Republic of Nigeria that they do not at any time during the continuance of the said term either directly or indirectly make use of or put in practice the said invention, nor in anywise imitate the same, without the written consent, licence or agreement of the patentee, on pain of incurring such penalties as may be justly inflicted on such offenders, and of being answerable to the patentee according to law for damages thereby occasioned:

PROVIDED ALWAYS that this patent shall be revocable on any of the grounds from time to time by law prescribed as grounds for revoking patents granted by me, and the same may be revoked and made void accordingly:

PROVIDED ALSO that nothing herein contained shall prevent the granting of licences in such manner and for such considerations as they may by law be granted

MADE this: **30TH DAY OF JANUARY, 2025**

JANE IGWE
Registrar



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MADE this: **30TH DAY OF JANUARY, 2025**

JANE IGWE
Registrar

STI-AWARD 2024

The project got the 1st position science and innovation Award (Tertiary Category) 2024, accompanied with One Million Naira cash award.


UJ/ACEPRD/LE/

MOLECULAR BIOLOGY AND PROTEOMICS TRAINING WORKSHOP FOR POSTGRADUATE STUDENTS AND STAFF AT UNIJOS

A NOVEL DNA POLYVALENT ANTI-TICK VACCINE

(JUTVAC-NG®) / (DOGVAC-N®)

This invention discloses two novel DNA anti-tick vaccines, JUTVAC-NG™ for Cattle, Sheep and Goats and DOGVAC-N™ for Dogs. These vaccines are formulated using a proprietary blend of antigens (BM86 orthologs) derived from three pathogenic tick gut proteins in Nigeria, ensuring a targeted and robust immune response in the respective animal hosts in Africa.

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ACKNOWLEDGEMENTS