

USING NEGLECTED LOCAL RAW MATERIALS IN DEVELOPING HIGH LEVEL INTERNATIONAL HEALTH MANPOWER.

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PROTOCOL: INTRODUCTION

To God be all the honour and glory for the permission granted me to deliver this inaugural lecture today. What is an inaugural lecture? Whatever it is, one is being delivered today by the grace of God.

Thanks be to our Almighty God, our creator, for bringing all of you here today and to the University management who He used to create an enabling environment for you to witness and listen to me, otherwise empty seats will be my audience thereby making nonsense of the whole arrangement. I wish to state that primarily, by the grace of God, I profess Powder and Tablet Technology, one of the expert areas of Pharmaceutical Technology and Industrial Pharmacy. Again, by the grace of God, I obtained my M. Pharm. and Ph D degrees in this area in the mid eighties under me able research leadership and supervision of Professor Oleka Kelechi Udeala, a one time elected and able Vice chancellor of this University after serving as elected Dean of the Faculty of Pharmaceutical Sciences and Head of Department of Pharm.Tech. and Industrial Pharmacy at different times for many years. May God reward him immensely in Jesus name. Professor H.C Mital, an Indian, was the Head of Pharm Tech. Department who God used to admit me then for the Masters Degree program. The Department, I was meant to understand, came up with the strategy and innovation to stop influx of pharmacists into more financially lucrative jobs in the pharmaceutical industries. The strategy was adopted in order to attract young and willing scholars needed to initiate and boost Academic Staff Development in the Department and the Faculty. How could poor me have been able to direct and supervise over a score PhDs and M.Pharm graduates in addition to another four Ph.DS expected to graduate this year 2008. (See Appendix 1) May God continually reward Godfearing thinkers like Professors O .K Udeala and H.C Mital and all true teachers of mine from

the day my mother gave birth to me. I am happy that my PG students are enticed and wooed and appointed Lecturers, Heads of Departments , Directors , Professors and some as Ministers of God here and there, after falsely accusing me of ' mass producing' them in our Department. I can only pray that God Almighty should forgive and that those forgiven should accept and make necessary restitutions.

Going by the current Encyclopedia of Pharmaceutical Technology, edited and published in the United States of America, [James Swarbrick and James Boyle, 2003] every aspect of PHARMACY can be treated under pharmaceutical Technology, and I add, Industrial Pharmacy. Immediately 'I was sent forth' as an accredited researcher and philosopher by the grace of God in August 1986 [when I obtained my PhD degree], I applied to the School of Postgraduate Studies here through normal channels to secure approval to supervise higher degrees. Then I was still a lecturer grade I. The permission was granted in writing and I was able, by the grace of God, to give audience to the first three former undergraduate students of ours who were attracted by whatever they saw in me then and perhaps now. By 1988 to 1991, these three young men had completed their M. Pharm research work, under my leadership and supervision, and had also written their course work examinations set by all the lecturers who taught each Course. Each of the students defended his Dissertation before a panel of internal and external examiners. We recommended all of them as Lecturers 11 in the University of Nigeria. The University after receiving their written applications for teaching positions, interviewed, approved and employed all of them -- two in Pharmaceutics Department (one Igbo and one Idoma) strategically trained to raise high quality staff for our sister Department, Pharmaceutics. Professor O.K Udeala must be commended for this success story.

The other candidate, an Igbo, who applied and was also trained is still in Pharmaceutical Technology and Industrial Pharmacy till date. One of the research work with my Idoma supervisee, published in a famous French STP Pharma Journal (written from the Dissertation on an anti-malarial formulation by Microencapsulation technique), was quoted in the authoritative Reference PHARMACEUTICAL

CODEX ,United Kingdom in 1994 as a reference work for further reading. I am excited and very happy today that these three young men are all lecturers in the UNIVERSITY OF NIGERIA AT THE PROFESSORIAL CADRE LIKE MYSELF INSPITE OF UNNECESSARY distractions and OBSTACLES to stop us. All three candidates had their PhDs under us. Two of them are UNN full professors now while one, an Igbo, is an Associate professor waiting for final assessment result for full professorship. To God be the Glory.

With my vision to contribute towards better Health for my fellow country men, I decided to stay back all these years to help train practically by example and empower our poor and restless youths and impoverished people from various tribes in Nigeria. Most of my researches therefore had to do with local raw material sourcing from our environments-plants, discarded materials and neglected cash crops found to have great potentials for use in the **pharmaceutical** and allied industries as I learnt from my own supervisor and others.

Generally, researches under my leadership fall under the following categories:

- i pharmaceutical raw material sourcing and processing for National and International attention, especially Plant hydrogels which enjoy wide investigations in Nanotechnology applications in Modern drug delivery design of almost all pharmaceutical dosage forms or preparations.
- ii formulation of the processed raw materials into various pharmaceutical dosage forms such as powders, granules, nanocapsule. capsules, tablets, oral liquids, external liquids, injections, ointments, creams, etc(See Table 1).
- iii quality control/assurance of the prepared drug delivery systems and comparison with National and International standard pharmaceutical formulations.

iv Design and fabrication of basic pharmaceutical quality control and test equipment as substitutes and supplements to imported ones,

v aspects of Clinical Pharmacy-biopharmaceutics, pharmacokinetics and pharmacotherapy monitoring of prevalent diseases in Health Institutions vi aspects of Social and Administrative Pharmacy

There are other useful things God led and used me to do in this University, other Universities, Research Institutions and Human Communities. Some of these will be seen under Appendix 1 and will be highlighted later.

FORMULATION ADDITIVES OR EXCIP1ENTS

The raw materials incorporated as additives during drug formulation can be summarised as follows:

Dosage form	Raw materials (examples)	Functions
A. Powders, capsules & Tablets:		
i) Fillers	Lactose, starches, microcrystalline cellulose	Increase size or bulk of the dosage form.
ii) Binders	Starch paste, gums, microcrystalline cellulose, gelatin, methylcellulose	Impart cohesiveness to the formulation
iii) Disintegrants	Starches, microcrystalline cellulose, gums etc.	Cause disintegration of dosage form to release the drug to the body
iv) Lubricants	Magnesium stearate, hydrogenated vegetable oils etc	Reduce friction .
v) Glidants	Talc, starches etc.	Improve flow rate of powders/granules
vi) Flavours	Volatile oils etc.	Impart sweet smell to formulation
vii) sweetners	Sucrose, mannitol etc.	Improve taste of product
viii) colourants	Caramel, tartrazine etc.	Improve aesthetics of formulation

B. Syrups and suspensions

Vehicle	Purified water	For dissolution or dispersion of the active ingredients and other additives
Viscosity/suspending agent	Sucrose, starch, mucilage, gums, methylcellulose, gelatin	Increases stability of product
Polyols	Glycerol, propylene glycol, sorbitol	Increases product stability and prevents crystallisation of sugar
Sweeteners	Sucrose, mannitol	Improves taste of product
Flavours	Volatile oils, e.g. xylopiia & monodora ¹⁰ fruit juices e.g. mango, pine-apple, banana	Improves taste and smell of product
Preservatives	Hydroxybenzoate esters, extracts of some Nigerian plants e.g. Alstonia boonei, and eupatorium odoratum,	Protects formulation from microbial degradation
Colourants	Caramel, tartrazine, some plant materials	Improves aesthetics of the product.

C. IV fluids e.g. Dextrose/water:

Vehicle	Sterile water for injection	Solubilises the added substance and hydrate patient.
Active ingredient	Dextrose	Source of energy to sick person

D. Small volume injections:

Vehicle	Sterile water for injection, propylene glycol, some fixed oils.	Dissolve or disperse drug and other raw materials
Bactericide	Cresol, chlorbutol, phenol.	Protects product from microbial degradation
Antioxidants	Ascorbic acid (vitamin C), sodium metabisalphite	Protects product from oxidative break-down.
Chelating agents	Disodium edetate, citric acid, tartaric acid	Removal or deactivation of unwanted ions.

E. Creams, ointments, suppositories etc.

Ointment bases/components	Hard, soft and liquid paraffins, cetyl alcohol; vegetable oils e.g. Arachis, castor, coconut	Vehicle for dispersing the drug.
Glycols	Glycerol, polyethylene glycols	Emollients, humectants and stability enhancer.
Emulsifying /stabilising agents	Macrogols, gums, etc.	Stabilises product
Preservatives	Hydroxybenzoate esters; etc.	Protects product from microbial degradation.

Pharmaceutical Local Raw Material Sourcing

'Necessity is the mother of invention' is a popular adage worldwide. Necessity makes or drives willing and God fearing persons to think and pray to God for solutions to problems. The military era in Nigeria can be said to have bastardized the University system and very negatively affected the output of Research Laboratories and Institutes for National Development. Nigeria was blacklisted somewhere on the line and meaningful researches were grossly and adversely affected. It was no longer possible to secure free research samples from scientifically and technologically developed countries, hence our vision and determination to begin to explore our flora , fauna and mineral deposits for teaching and research instead of rightly murmuring and complaining 24h against the draconian militarization, witch- hunting, sabotage, suspicions and wicked assassinations here and there. It was not palatable at all but we decided to move into what I call Agricultural and Environmental Pharmacy Research. This involved exploring and screening plants and inanimate materials around in order to generate local pharmaceutical raw materials as possible substitutes for imported ones as long as they meet standards specified by NAFDAC or the WHO. Should we be importing sand grains and barks of trees that are abundant everywhere in Nigeria for use in teaching and research here? Are we still importing water for injections, processed common drug tablets such as paracetamol tablets and Vitamin C tablets? We can overcome the temptations of embezelment of public and private funds meant for specific projects by being truly God fearing. The following were scientifically studied in our laboratories, in the Department of Pharmaceutical Technology and Industrial Pharmacy and at times using other laboratories in our faculty, the university and outside (wherever we located any useful equipment and persons willing to help us). There was little or no sponsorship from anywhere including the University, except ones poor salary and family sweats. I will only give the summary of what was done with or without brief comments. I thank God for the postgraduate students who worked with me and some trustworthy undergraduate students who did not forge data. Laboratory technologists and assistants in our Pharm. Tech laboratories helped during the researches. My wife, Nomnso, became really my able

Pharmaceutical and Social Research partner everywhere, and including our bedroom and hotel rooms. Nne, my only wife and most beautiful friend and prayer partner, when we are physically together or by GSM phone, God will continue to keep and bless you and all of us in Jesus name. You are wonderful. I remember that in my absence, you ably manned and explained many aspects of our UNN Quality Control and Raw materials exhibition stand at the International Conference Centre, Abuja in 2004 because the NUC then, was alleged to have charged exorbitant registration fees that made some Universities to cancel sponsorship of Research Academics, Technologists and Laboratory Assistants earlier approved to go for the First NUC Science and Technology Exhibition at Abuja. It was frustrating for one to spend ones family resources carrying out expensive laboratory researches in order to overcome the Publish or Perish Syndrome.

Melon Seed Oil

^ The first local raw material I decided to investigate was melon seed oil. The extraction, purification and pharmaceutical use of the oil was studied. The idea came because Arachis oil B.P and other approved ones used in many pharmaceutical preparations contain this oil which is obtained from groundnut seed and is abundant in the Northern parts of Nigeria. Melon seed is abundant in Nigeria just like other seeds. The topic was assigned and we purchased the melon seeds, got the oil, processed it to what we tested and stored. The oil was used to prepare pharmaceutical lotions e.g. Salicylic acid lotion and emulsions(anti-fungal preparations) that compared favorably with those prepared with imported Arachis oil of the British Pharmacopeia. The work titled "Physico-chemical properties and Pharmaceutical Applications of Melon Seed Oil" led to the award of M.Pharm degree in 1988 to the first PG student I ever supervised in the University of Nigeria as an approved sole supervisor. Two publications from this research work appeared in I wo peer reviewed National Scientific workshop proceedings in 1990 and 1991 in University of Benin and A.B.U Zaria respectively. The objective of the research was to motivate farmers to cultivate this local plant seed whose use can extend from the food industry to the Pharmaceutical and Health sector, thereby conserving foreign exchange and creating jobs for our youths and our people. These would help fight poverty and unemployment. Our colleagues in Agricultural Research are further challenged to

get us more of this plant seed and other plant raw materials to be mentioned during this Lecture. These can be done through genetic engineering in green houses using modern biotechnological methods.

Plant Hydrogels - Gums and Mucilage

Having researched on mucuna flagillepes (aruro, ukpo) gum from 1981 to 1986 under my research teacher and supervisor, Prof O.K Udeala, I could 'speak' to most plants and ask them if they have or can produce useful mono or polyelectrolyte hydrogels within minutes and then go ahead to think of and design how to get them into purified powders and note the yield. The plants whose seeds, fruit, root, stem, bark, leaves or flowers have been screened by my team of students are many. Some plant sources could not measure up to our desire and they were abandoned. However, our basic/ preliminary researches opened the door for further research in allied fields of study. Our efforts motivated our colleagues in Biochemistry, Microbiology, Pharmacology, Chemistry and Food Science and Technology, Medicine and Veterinary Medicine here in UNN and other Universities/Research Institutes to investigate from their own basic research angles what we originated. Some acknowledged us, others did not. No references were made at all about us or* UNN. in their publications here and there. Researches were opened up in the following edible plants hitherto u-rd only by rural dwellers in some parts of Nigeria. Some Research Publications on these are collated under references at the end of the Inaugural Lecture booklet.

- > **Cissus gum (Okoho):** Three of my PG research students, one now a director in a federal establishment and the other a professor, former Ag. HOD of Pharmaceutical Technology and Ag. Dean of this Faculty were awarded M.Pharm degrees of this University in 1990, 1991 and 1994 respectively as a result of our work and my efforts to introduce the root and stem gum to the Pharmaceutical Industry either as tablet binders, suspending agents or emulsifiers. Preliminary research finding
- > with one of my undergraduate project students on Cissus root gum was published in the (USA DniL¹, Dev. and Industrial Pharmacy Journal in **1989**.

Detarium Microcapium gum (Ofo, Oho): My team of researchers benefitted immensely academically, from this seed gum used by few rural dwellers in Nigeria as a thickener in soup. Multiple throng researches

using this gum began. The preliminary investigation with one of my undergraduate students (whose publication appeared in a national workshop proceeding in 1991) has of today, based on various in- depth research in our department, led to the award of degrees to three of my PG students (two M.Pharm, Pharmaceutical suspension and drug delivery and the other in tablet formulation technology both in 1994. The other secured a Ph.D degree in Bioadhesion studies involving this neglected plant seed in 2005. Films from this gum when properly plasticized, can find use in capsule shell manufacturing as well as other applications in pharmacy. Let me mention here that this gum gave a Masters degree to one of my female PG students in 1994. Hence, our laboratory has since been gender sensitive in our efforts here to raise National and International manpower.

Abelmoschus esculenta gum (Okra): In

Nigeria, a university in the South West awarded a Ph.D degree to one of our friends and colleagues who used the fruit gum in liquid drug delivery research. In our laboratory, parallel

researches using this gum was going on and earned one of my first two female P(i students in this University a Masters degree in 1994. They were neither from my LGA nor my GEOGRAPHICAL State. By the Grace of God, these ladies were never discriminated against by us since my type of research team leaders hate evil, no matter how colored and presented to persons or panels. Okra gum also earned one of our PG students a Ph.D degree as I directed in Powder and Tablet Technology in spite of unnecessary distractions during that period 'for so called peace to reign'. Never should it happen in our universities again to use military fiat and backing to recommend and appoint postgraduate students as Heads of Department to carry their question papers and result files.

Other plant hydrogels I did preliminary investigation on include Brachystegia gum

(achi), Treculia Africana gum, Kolanut leaf gum, e.t.c. There are on-going

researches in some of these and other gums.

- > **PROSOPIS:** I must mention our effort to introduce *Prosopis africana* gum (okpei) into commercial production of various tablets such as paracetamol, magtrisilicate, Iblic acid, Vitamin C, etc, in a well articulated pilot scale up studies using a pharmaceutical industry at Enugu. Earlier, Prof. O.K. Udeala had originated researches in prosopis gum that earned one of his students a Ph.D degree of this university and who is now also a professor of Pharmaceutics of this university. We had no problem screening and investigating this gum thoroughly through pilot scale up studies in one of the foremost local pharmaceutical manufacturing firms, east of the Niger at Enugu. I am still waiting for real pats on my back for the study that took a lot of my time and energy and eventually earned one of my students a Ph.D degree of the University of Nigeria.
- > **Grewia gum:** We isolated this polysaccharide galactomannan gum from *Grewia mollis* that grows in various parts of Benue, Plateau and some other states in the Northern parts of Nigeria. Rheological studies on this gum as well as the characterisation of the gum powder were studied extensively with a view to introducing it as a substitute to imported Acacia, gelatin, carboxymethylcellulose and other pharmaceutical grade gums. The immediate past Head of Department of **Pharmaceutics** and Pharmaceutical Technology at the University of Jos, an alumnus here, bagged a Ph.D degree of this University in 2001 as a result of his thesis presentation and defence in *grewia* gum. He is not from my state. The water vapor permeability across the cast film of this drug and selected drug formulations using it were studied in details and published. Prof. O.K Udeala was an approved co-supervisor to the Ph.D research work.
- > **Soluble Cellulose, SCDLVG:** Germany produced soluble cellulose in the mid 50's while U.S.A was reported to have produced this in the 70's during the 20th century. In our effort to look inwards in our laboratory, series of researches were started on various grades of cellulose. However, it was in the late 90's that, working with one of my Ph.D supervisees, we were able to produce soluble cellulose. Processing from Indian bamboo that grows widely in Southern Nigeria, characterization and application of this low viscosity grade carboxymethylcellulose led to the award of

Ph.D degree to one of my PG students by the University of Nigeria in 1997. The student is now a professor of Pharmaceutical Technology and Industrial Pharmacy here in U.N.N. The devil rose against the award of this degree. As a supervisor to this work and many others, I suffered a lot of persecution from the hands of my people in the ivory tower here and their political mentors outside. Lies and blackmails were fabricated against me for trying to teach our poor students and trainee research staff how to get something useful out of nothing as a Christian researcher, following prayers and inspirations from the Holy Spirit. I could remember being invited to speak in a seminar abroad and barrels of questions over our SCD-LVG research at an international laboratory in Argentina, specifically at the Institute for Theoretical and Applied Physical Chemistry, INIFTA, National University of La Plata near Bueno Aires. International researchers from Germany, the U.K, Canada, U.S.A etc came to listen to me to prove to them that what we did was right and also to learn from us. I could remember Prof. Zugamair of Clausthal University, Germany asked me serious questions for going into polymer and cellulose research which according to him is not my area of specialization. There was laughter in the capacity filled research seminar hall when I told him that as a professional and well trained pharmacist with a 1986 Ph.D degree in Pharmaceutical Technology and Industrial Pharmacy, that I studied chemistry first before learning the art and science of pharmaceutical and medicinal chemistry, pharmacology and phytochemistry as well as pharmacology and pharmaceutics at the undergraduate level in the University of Nigeria, my alma mater. That qualified me to read and pass basic pharmacy which is an applied chemistry/science. I also informed my listeners then in 1998 that since Nigeria was blacklisted by the International community due to militarization for over 32 years then we had no alternatives in our laboratories than to research on basic materials, process and characterise them before using them to Formulate research medicinal products pending further preclinical and clinical studies before use in man. God was and still is on our side in our initiatives and innovations in the midst of compradors seemingly working for impersonators, neo colonialists' pen and allied robbers. Some people from

all works of life began to see reason with us and desired to learn from us after the international seminar sponsored by the Third World Academy of Sciences, Italy. The PhD degree blocked by local compradors here, illiterate politicians and get-rich-quick busy-bodies and research contractors was unblocked by the finger of God. Soluble cellulose is today copiously used widely in the oil drilling and exploration industry, pharmaceutical industry, in the preparation of many medicines tablets, granules, powders, emulsions, creams, gels, nanotechnology e.t.c. Appropriate grades of soluble cellulose are also used widely in the food industry, soap making industry, ink and print media industries, e.t.c. Proper sponsorship of this research may save Nigeria billions of Naira per annum if local production is initiated since there are sources of cellulose everywhere in our bushes in Nigeria and West Africa. I thank God that after my trip to Argentina and defense of our work here and there following accusations from detractors, my research student who was afraid and became confused and embittered due to the blockade smiled at last when the degree was awarded with effective date still 1997 when hirelings did all manner of things to cancel the work in the post graduate School, UNN . I thank God for seeing me through the hardships, blackmails and embarrassments. The persecutions have made one wiser in one's dealings with all manner of human beings. Scientific publications from this 'controversial' SCD-LVG powder appeared in the prestigious proceedings of the 18ⁿ International Pharmaceutical Technology conference held in Utrecht, the Netherlands in 1999 amongst others. Nigeria is still heavily importing various grades of cellulose till date in many industries outlined earlier.

Macrocrystalline Cellulose, MCC: Various grades of this insoluble powder are used in the tableting industries as a bulking agent, disintegrant or what we call a clircvt compression vehicle. Some drugs like diazepam are presented as 2mg tablets, chlorpheniramine as 4mg tablets. These are two small that some with bad eyesight may not see the quantities. Bulking agents like microcrystalline cellulose are therefore added to increase the size. MCC in such formulations has the dual role to explode the

tablet or capsule when swallowed and it comes in contact with moisture in the stomach. For drug powders that do not form strong tablets, MCC also imparts strength when mixed accordingly to act with such 'weak' powders on compression with suitable tablet presses. In the middle belt region of Nigeria, we have a lot of *Andropogon gayanus* (ata) and *Sorghum bicolor* ([millet plant]). I directed one of our students from the middle belt to move into research action on these plants. He completed the Ph.D. research program in 1999 and today he is a Director in a Federal establishment. He ably presented part of this research work in the famous 21st International Pharmaceutical Technology conference that held in Dublin, Ireland in 2000 and the publication appeared in the proceedings. Again, Prof O.K Udeala co-supervised the work. Microcrystalline cellulose special grades are also used in chromatography. Till date, all the grades for various industries are still imported when the major raw materials are here.

Carica papaya and Ananas comosus: Do not mind the confusing botanical names. *Carica papaya* in Igbo is Okwuru bekee or Okwuru mbeke or pawpaw while *Ananas comosus* is akwuchukwu or pineapple. These two fruits which are rich in vitamin C grow as economic plants and used mainly as food and drink in Nigeria. Research on potential applications of the processed edible parts of these fruits after due characterisations by one of my Ph.D students led to the award of the Ph.D degree in 2005 when he presented the research seminar and successfully defended the thesis before a panel of internal and external examiners.

The processed ripe fruits were used singly or in suitable combinations as a multi-purpose vehicle to formulate and prepare selected drug powders into elixirs, syrups and pharmaceutical

suspensions. The graduand is today a lecturer and an internationally sought consultant. There are other plant materials that we have

done preliminary screening on their possible uses in the Pharmaceutical industry including those that have active ingredients used in herbal medicine.

> **Xylopia aethiopica and Monodora myristica**

Essential Oils: Xylopia aethiopica (uda) and Monodora myristica (ewhu, ewhure) are food flavors that we have found to be very useful as potential local substitutes for foreign flavors in pharmaceutical products. Our female Masters research student placed on this work creditably formulated and tested Paracetamol, Chloroquine phosphate syrup, e.t.c with these local and edible plant flavours and U.N.N awarded her M. Pharm degree in 1993.

> **Drug Formulation Researches:** When we process raw materials into purified powders or liquids, we always end up using them to prepare medicines at the research level. The products are characterized, and based on pre-formulation studies we predict their usability or not in pilot scale up studies and commercial use. While searching for better products, my team has formulated pyridoxine hydrochloride (Vitamin B₆) which led to the award of M.Pharm degree to one of our students in 1989; produced an anti-malarial product by the technique of microencapsulation in order to mask the bitter taste. Again this led to the award of M.Pharm degree to one of my students in 1990. Many other therapeutic agents formulated and their quality control ascertained included **Chlorpheniramine** maleale tablets, Theophylline hydrate tablets used in asthma patients, Paracetamol, Metronidazole, Hydrochlorothiazide, Frusemide tablets, e.t.c.as can be seen under references at the end of this presentation.

> **Drug Product**

Quality Control: I was privileged to have confidentially served this country in the area of drug quality monitoring due to my faith in God as a

born again Christian and by my training as a Pharmacist registered and licensed in the Federal Republic of Nigeria. Like a palm wine tapper on top of a high palm tree in the mornings and evenings, I have seen a lot of evil practices of heartless men and women who iniquitously, illegally, politically and satanically import, manufacture, distribute or retail fake and substandard drug products to all levels of health care institutions just to make ill gotten money and intimidate people here and there. In 1989, the News Agency of Nigeria had to release for publication in the major dailies the title "UNN alerts the nation on fake drugs". While screening some products brought before me for judgement, found out that a product being marketed as Ampiclox had neither Ampicillin nor cloxacillin in it but an ordinary milky white powder. Unfortunately, cartons of this were delivered to a Teaching Hospital for use before detection and report to appropriate health authorities. That same period a white coated tablet in beautiful packs labeled as "buscopan" were found to contain starch with no drug at all in the tablet. This was also reported. Since then, a lot of threats on my life and blockades continued because I refused brown envelopes and carrots dangled to seduce me to join

murderers and their sponsors who love money more than **human** lives. Development of quality control test kits were initiated earlier by my supervisor and many techniques in addition to the ones in various pharmacopoeia were used to research and help the world. Such researches from here including techniques for predicting in vivo bioavailability were published in international and national journals of pharmacy and proceeding of international conferences in India, Italy, Netherlands, U.S.A, Nigeria etc. Perhaps my efforts in the area of drug

quality control and assurance caused the Hon. Minister for Health to approve my being a certified Federal drug analyst No 295 in 1990. The Hon. Minister then was a Yoruba, Late Prof. Olikoye Ransome Kuti, and he was not my townsman as was widely peddled by liars. An Igbo minister of health never signed my Federal Drug Analyst Certificate which, 1 repeat was issued to me in 1990 in Lagos, Nigeria. A colleague of mine forwarded our completed forms and a pharmacist youth corper 1 saw going to Lagos signed for and collected my Analyst certificate. I never bribed anybody or went through any God father. The father 1 went to is God through my Lord and Savior Jesus Christ. By the grace of God, 1 never signed that fake was standard in spite of allurements and threats to Life. Quality control investigations need 100% strictness and fear of God to execute righteous judgment no matter whose ox is gored. 1 hardly get drug analyses calls because people know that 1 cannot bend and join the bandwagon to show off wayward and ill gotten wealth, by the grace of God.

> Pharmaceutical Quality Control Test Equipment Design and Fabrication. Lack of almost all imported test equipment from the late eighties made one to begin to think of how to get on with teaching our undergraduate students the basics so that whenever they find better equipped and staffed laboratories, those students who are serious university materials will excel irrespective of the environment they find themselves. The objective was at least to simulate broken down equipment since replacement or acquiring new ones were impossible in a country where acquisition of wealth by all means and negligence of child/youth education is the order of the day by various Community, Local Government, State and Federal authorities. I am not a trained mechanical, electrical, chemical or computer engineer. However, as one

who uses machines and was taught materials of pharmaceutical plant construction in Pharmaceutical Technology (Pharmaceutical Engineering). I began to think, design, check workability and give out research topics to some of my postgraduate research students in test equipment design and fabrications..

In my small book titled "Key Points in Pharmaceutical Formulations and Industrial Pharmacy" (2001), I dedicated a chapter to 'Fabrication of Pharmaceutical Production and Quality Control Equipment in Developing Countries". For us in Pharmaceutical Engineering, we always insist that parts of our production and test equipment that readily come in contact with the formulation ingredients must always be non-reactive. This is why we use stainless steel 316 as the material of construction in the processing or testing zone of most pharmaceutical equipment. For most quality control equipment, they can be made of suitable PVC, Perspex or borosilicate glass. Oxidation-Reduction reactions during processing of vitamin C can cause browning of the drug if iron material comes in contact with the formulation. Three students I supervised, one female and two males, were each awarded an M.Pharm degree of the University of Nigeria, Nsukka in 1992, 1993 and 1995. The titles are Fabrication and Evaluation of Prototype Friabilator and Flow meter, Fabrication and Evaluation of a Prototype Dissolution Rate Apparatus and Design and Evaluation of a Prototype Disintegration

Dissolution Apparatus, respectively. Some of these were presented in the National Pharmaceutical Technology Conference at the University of Ibadan in 1994. The data on the drug release rate, disintegration times and friability respectively compared very favorably with the equipment imported from abroad. The locally fabricated ones with the aid of our local roadside technicians were very cheap when compared with the imported equipment.

> Other Researches (Pharmacy Services): I am

happy to state that as a fellow of the West African Postgraduate College of Pharmacists (by election) since 2002, God used me to design and supervise the following researches that were successfully defended and led to the award of FPC Pharm of the college to some high level Pharmacists who registered in various faculties of the college, including clinical pharmacy. The

titles are as follows:

- Procurement and Management of Essential Drugs in Public Health Facilities of Enugu State, Nigeria
- Use Pattern of Antibiotics by in- patients in National Orthopedic Hospital, Enugu.
- A Comparative Study on the physicochemical and Microbiological Properties of Ceftriaxone marketed in Enugu State, Nigeria.
- Quality assessment of Piroxicam capsules marketed in Enugu State.

RESEARCH OUTPUT IN HIGHER INSTITUTIONS AND THE PMN SYNDROME.

With the world now reduced to a tiny village due to ICT innovations, researches in all fields need to be current, educative, informative and contribute to knowledge. Researches are to address specific needs of the society for them to be relevant. Promotions of Academic staff worldwide is heavily tied to active research and original research output in the form of high quality, high impact factor rated publications in peer reviewed National and International journals. At present in our country, everybody seem to agree that the environment is not yet conducive for very effective research work especially in laboratories where electric power supply is required for various teaching and

research operations hoping that the basic research materials and infrastructure apart from electricity are available. This raises the issue of insufficient funding in both Government owned and Public Educational Institutions leading to increasing Academic fraud such as plagiarism, preliminary research data piracy, forgery and fake research data generation by hypocrites parading as academic staff and researchers who only recycle existing data of other workers. No wonder the high spate of corruption, nepotism, sexual harassment either way to effect intra or inter university PUT MY NAME, (PMN) linkage and other vices reported in some higher Institutions of learning. This great disease discovered recently and called the PMN syndrome by me is threatening the fabrics of Teaching and Research in our Higher Educational Institutions. The disease is characterized by greed or avarice, confusion, tachycardia, elevated BP, stroke and eventually death. PMN syndrome is "Put My Name" syndrome in a research publication the promotion seeker neither contributed any knowledge nor anything except one form of bribery or the other. It is like HIV/AIDS syndrome that docs not know the rich or poor. It attacks selfish and power seeking people most. It displaces real researchers and uncompromising academics in an environment of high corruption where mentoring has lost its meaning and "man know man reigns instead of merit through healthy competition. PMN phenomenon can make an illiterate market woman or man have 20 research publications in a year by having his/her name put in a fake or real researches as a research team member by contributing money as low as #1000.00 or #20,000.00 or any form of gratification to immoral researchers. The irony is that a market man or woman who does not know the research topic or hardly can face an audience anywhere can bribe or buy his or her way to the position of a Seniorlecturer, Associate Professojship or Professorship and gets promoted before real toiling and hard working academic researchers. Because of this, it has been proposed in some quarters that candidates seeking promotion to any rank should be screened through transparent interviews in other to preserve -' Intellectualism and in-depth knowledge in one's

area of expertise required to teach and research in degree awarding institutions globally. Implementation of this everywhere using experts and academic consultants within and outside each institution will provide good quality assurance in decaying Teaching and Research Educational Institutions. Where this is not done and quickly too, the children and youths, the leaders of tomorrow in any country including ours will be completely destroyed.

Mr. Vice-Chancellor and Chairman of this occasion, Principal officers, respected Deans of Faculties and Professors, other members of the University of Nigeria Senate, Lions and Lionesses, Invited Guests, Distinguished Ladies and Gentlemen; with God all things righteous are possible especially if man plays his own roles by loving God and his neighbors without plotting their downfall and destruction. My Inaugural is to show that even more than Japan and Malaysia, we can rapidly sacrifice ourselves positively, make ourselves available, harness our abundant local resources, characterize them and use them internally and export to ECOWAS space and other countries. In the area of Health, indigenous high level National and International manpower development within has been demonstrated practically in this Inaugural Lecture today. There is hope and brighter future for our misguided youths as well as all Senior Citizens. There is great need for practical sacrificial love, forgiveness and meaningful Restitution so that God who sees and knows the thoughts of every one irrespective of tribe, color, religion, will give us the peace and satisfaction that passes all understanding.

Thanks for listening. May God take all of you home safely in Jesus name.

Professor Amarauche Chukwu.

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