



### From the Editor

Onwards and upwards. This newsletter gets more informative every month. It is also with great pleasure that I introduce our AAMPS monograph author of the month.

Dr. Emeje Martins from Nanomedicine, Nigeria. Dr. Martin's is one of the leading phytochemists in West Africa and his work at the National Institute of Pharmaceutical Research and Development in Abuja has been outstanding. His contribution to AAMPS is hence of great importance.

Our company of the month PhytoQuest was recently visited by Professor Katerere during his stay in UK this summer.. It is one of the many pioneering companies in Europe that see the value of African plants in the developing of new products in the field of nutrition and herbal medicine. Congratulations to Dr. Nash and his team on their pioneering efforts.

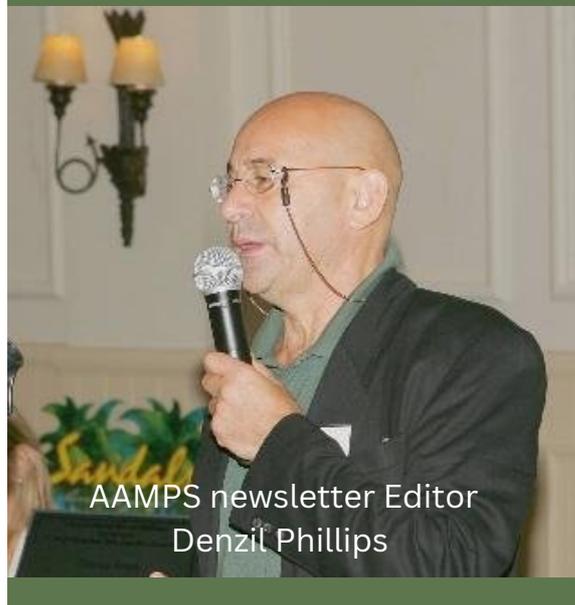
Last but by no means least our profile of the outstanding work of Professor Norman Nyazema who has been one of the leading figures in the field of ethnopharmacology in Africa for many years. He is certainly is a Legend in his field.

Keep Well,

*Denzil*

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AAMPS newsletter Editor  
Denzil Phillips

### Monograph of the Month

Garcia kola plant by Prof. Martins Emeje



Professor & Founder, Nanomedicine Centre, National Institute for Pharmaceutical Research and Development

National Institute for Pharmaceutical Research and Development (NIPRD)  
University of Nigeria

Prof. Emeje Martins is a Professor of Nanomedicine based in Nigeria. In this interview, he talks about one of his three monographs of focus, Garcia kola, that he was first introduced to as a child by his father, then used as a student in University before he joined a research team that focused on GC. This is his story.

Q: What Monograph are you working on?

A: I'm working on about three monographs, with focus on Garcinia kola at this time

Q: Who did you work with and what was the best thing about working with that person?

A: I work with a team of highly self-motivated mentors and mentees. Some of my mentors include Profs. Gamaniel, Amos and Kunle, while mentees include Drs. Ezenyi, Aboh, and Okoh

Q: What challenges do you face with the collaboration?

A: Practically no personal challenges. However, sending samples to the USA where one of my collaborators is based has always been a challenge.

Q: Can you share some fun facts about the species that you chose.

A: The fun about GC is that, my dad who incidentally passed on three months ago usually teased me for making medicines out of GC. This is because, GC is a social substance in Nigeria; used to entertain visitors in the palace, so dad would tell me -

he could teach me what GC can do, and this include, treating cough, being aphrodisiac, and even eaten to prevent dozing off while on the steering; up till now, I chew GC anytime I hit the road on a long journey. Whether it is truly aphrodisiac, I do not have the practical experience!



Typical Garcia kola tree



Garcia kola nuts

**Q: Why do you have such interest in this Species?**

**A:** First, it was a non-scientific interest which developed about 35 years ago when I first chewed GC for cough, and the cough disappeared in two days. Subsequently, I did while in pharmacy school to keep awake at night. In year two in pharmacy school, GC was taught by late Prof. Owonubi, elucidating the numerous medicinal properties of the plant. Eventually, and after taking up research as a career, I came in closer contact with scientists such as Prof. Maurice Iwu who have worked on GC.

Generally, my passion on medicinal plants has been in the area of standardization, dosage form design, preparation, and development of stability monitoring parameters. Recently, my team developed GC lozenges. We believe a lot is yet to be studied on this “wonder” African plant; we will do anything to promote it.



Accreditation of our laboratory by ANAB  
(C) Martins Emeje

**Q: What uses does it have and have you used it yourself?**

**A:** Garcinia kola is considered a wonder plant as every part of it is of medicinal importance. The plant is used in folklore remedies for the treatment of ailments such as liver disorder (cirrhosis and hepatitis), diarrhea, laryngitis, bronchitis and gonorrhoea. It has antipyretic, antibacterial properties. It is used in the treatment of cough and asthma. It has purgative, anti-parasitic, antiviral, anti-inflammatory properties. It is used as remedy for guinea-worm infection and the treatment of gastroenteritis, rheumatism, menstrual cramps, bronchitis, throat infection, headache, colic, chest cold. It has anti-diabetic, anti-oxidant, and anti-trichomonal properties too. It has also been reported to possess immunomodulatory activity, antimalarial activity as well as molluscicidal, anti-allergic and analgesic properties. GC treats stomach ache, gastritis, venereal diseases, nervous system disorder and laryngitis.

**Q: What kind of research have you done into it?**

**A:** My research has been in the area of standardization, dosage form design, preparation, and development of stability monitoring parameters. Recently, my team developed GC lozenges. However, with my team, we have carried out several preclinical studies on GC to confirm or otherwise its folkloric use. We have developed novel delivery systems for GC, including as lozenges.

Developing monitoring parameters for Herbal products  
(C) Dr Martins Emeje and team



## Newsletter

Q: What are your thoughts on AfHP?

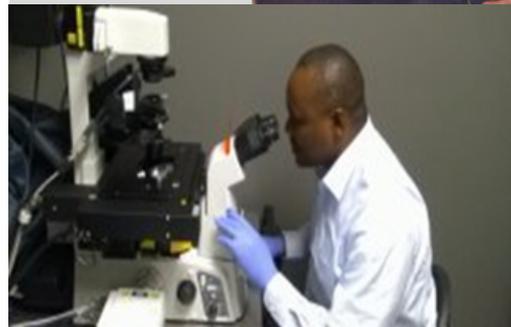
A: It is one of the best things to happen to Africa; nobody can like you more than you do yourself, therefore, rising up to the challenge of not only documenting but standardizing plants of African origin or plants growing on Africa soil is a job that must necessarily be done if Africa must develop and become medicine secure. All the major continents of the world have their own pharmacopoeia except Africa.

This project will remove the “error” of African scientists, researchers and regulators relying on standards set for non-indigenous plants to profile African plants.

Q: In five years’ time, what advances do you think this species would have made commercially and in research?

A: In research, I expect GC species that is fully characterized, i.e. standardization with reliable monitoring parameters that can be referenced and used for quality assurance. Commercially, I foresee more commercially available standardized GC raw materials and GC-containing products.

Prof. Emeje chatting with Nigeria’s president on a GC – containing herbal product



Prof. Emeje looking through GC-nanoparticles

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### Business Focus - PhytoQuest



commercially unavailable plant compounds available in pure form for screening.

**How did you come up with the name of your company?**

The name PhytoQuest Limited seemed a logical name describing what we do using the Greek word Phyto for plant. Although we have been through other names before including MolecularNature Limited and MNLPharma.

**Which indigenous African plants/ingredients do your products incorporate?**

We are just at the start of producing consumer products and have two product ideas. One involves a very special African honey containing one iminosugar that primes the immune system to respond more strongly to a wide range of problems: parasites, viruses, bacteria and cancer cells.

**What was the inspiration behind the birth of your business and where is it based?** The aim of the company is to find better and safer medicines based on identified active natural molecules but we also increasingly work on health supplement products using compounds we have discovered. We specialize in sugar-like molecules (iminosugars) because sugars are vital in how the body functions but are usually seen as difficult to work with and very few medicines target them. Plants produce a large number of sugar analogues for the purpose of protecting the sugars they produce by photosynthesis and these molecules can have health benefits to us.

The company is based in Aberystwyth, a small coastal university town on the west coast of Wales. The company was formed because we had a big investment from a UK pharmaceutical company who decided we were better at plant natural compound isolation and identification than they were. The idea was to form a library of new or-



Iminohoney: Copyright Phyto-Quest

The other is based on a molecule occurring in Baphia species (an African tree genus) that can control blood sugar levels; however, the molecule is in a complex mixture in Baphia species and requires purification before it can be used safely. We plan to produce and quality control both products in Africa. Other research we have done recently with workers from Nigeria include molecules to treat sickle cell anemia (Alchornea cordifolia), anti-covid molecules from Garcinia species and some recent work on Amaranthus leaves.



Gymnema extract capsules  
Copyright PhytoQuest

**Which problems are you solving and what makes your solutions stand out?**

Our main focus is on anti-cancer activity because although there are some cancers which can be treated quite successfully, there are many types where there has been little or no improvement in life expectancy or quality of life despite new methods such as CAR T cell therapies and anti-bodies for activating T cells (e.g. anti-PD-1).

**What successes have you had so far?**

We have identified some iminosugars that can activate the immune system and appear to override the inhibition of tumour cell responses. Mouse studies show good results and a natural honey containing one of these molecules from an African plant shows great promise in combination with surgery and chemo- /radio-therapy. The potential anti-diabetic molecule from Baphia is also looking good in studies for controlling diabetes. A standardised cucumber product given the trademark name Q-actin is also doing well for treating inflammatory disorders such as osteo-arthritis; it contains one iminosugar (idoBRI) that reduces inflammation by a novel mechanism and doesn't seem to have the long term problems of steroids.



PhytoQuest Founder Robert Nash  
and his team

**How many people does your business currently employ?**

PhytoQuest is a small company of 5 people but with a strong R&D output. We are very lucky to have some state-of-the-art instruments including a 500 MHz NMR for compound identification and quality control of extracts.

What are the opportunities that you see in the industry?

Natural products offer great potential to help prevent diseases and can work alongside pharmaceuticals to improve outcomes and reduce health care costs. What in your opinion, what should the industry improve on?

The science proving the benefits of natural remedies needs to be clear and good quality control applied. There are many misleading claims where the science is not good and this is confusing for the public and can lead to false hopes, wasting of money and sometimes a worse health problem due to a toxicity or other adverse reaction. The same can be true of course for approved medicines as well!

What advice can you give to a young person who wishes to start her own business?

I often describe our business as being like on a rollercoaster as it has ups and downs but it has the great advantage of us being in charge of what we do.

Where do you see your business in 5 years' time?

In 5 years we plan to have some molecules being developed as new medicines as well as two supplement products being produced in Africa.

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### *Iminosugars and their Applications*

Author - Reshoketswe Ribis, Department of Pharmaceutical Science, Tshwane Univeristy of Technology

Iminosugars are a group of natural molecules that resemble small sugars. First discovered in 1966 in a bacteria species and then isolated from mulberries in 1976 and subsequently from many other plants, some of these molecules have been in clinical trials for cancer, infections, and lysosomal storage disorders. Currently there are three iminosugar-based drugs available on the market; Miglitol is used to treat type 2 diabetes, Miglustat, to treat lysosomal storage disorders (e.g., Gaucher disease), and Migalastat used to treat Fabry disease.

Iminosugars mimic sugars and seem to readily enter cells but also seem to interact with cell surface receptors. Iminosugars can disrupt the proliferation of viruses and cancer cells and other defected cells by preventing them producing the glycoproteins involved in the diseases they cause. Due to their broad range of activities and presence in many healthy foods and herbal medicines, they have been applied in various medical conditions and this paper will present a summary of the applications of iminosugars.

#### Health claims

Persons who have used health supplements containing iminosugars have claimed that these molecules enhance health in various ways. Iminosugars are said to promote healthy aging, act as immune system boosters, provide energy and manage hot flushes. Iminosugars are also believed to have positive effects in cancer therapy, diabetic wound management, actinic keratosis, herpes simplex and post-surgery recovery.

#### Pre-clinical evidence

Iminosugars have been the subject of many in vitro trials and animal trials. Data from in vitro trials reported that some iminosugars can reduce inflammation and oxidative stress as with commonly mentioned antioxidants such as flavonoids that have poor bioavailability. These activities and good bioavailability could be responsible for their positive effects in aging, fighting infections like COVID-19, and in managing hot flushes. It has also been found that iminosugars increase macrophage and lymphocyte activity.

Macrophages and lymphocytes are white blood cells which are important in supporting our immune systems. Certain iminosugars were also found to reduce the production of tumour necrosis factor (TNF)-alpha and produced anti-viral effects in Dengue virus infections (DENV). TNF-alpha is proinflammatory and is known to be involved in the pathogenesis of some inflammatory and autoimmune diseases.

In animal studies, iminosugars were found to increase the production of immune cells and enhances their activity. Iminosugars reduced TNF-alpha production and enhanced T helper 1 cells, Interleukin-12, interleukin-2 and interferon gamma. This results in improved immune response to infection and enhanced antitumour activity.

### Clinical evidence

Iminosugars and their derivatives have been studied in clinical trials involving cancer, viral infections and lysosomal storage diseases. Reduction of cytotoxic effects in chemotherapy was noted as well as increased interferon gamma activity.

Interferon gamma promotes macrophage activation, mediates antiviral, and antibacterial immunity, enhance antigen presentation, and overall improves the Type-1 'healing' immune response. Iminosugars have also been used out of formal clinical trials.

The results of this bring about a large body of anecdotal evidence which suggest that iminosugars can be beneficial in the management of various diseases. Iminosugars are said to be beneficial in treating human and animal tumours. They have been found to control infections, aid healing and prime the immune system while also seeming to regulate the cytokine responses. They have also been used in wound management and are said to aid in healing of non-healing wounds, induce healing response of damaged spots, and stop progression of sores.

Iminosugars are also said to improve appetite and digestive system functioning when eaten. Iminosugars are truly interesting and show great potential as a class of medicines and components measured in standardised supplements and selected foods.

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### *In Conversation with a Legend*



Professor Norman Nyazema

#### Life and times of Prof Norman Nyazema

There are not many who have trained as health care professionals in South Africa, Botswana or Zimbabwe who would not know Norman Nyazema. He is an affable, easy-going and passionate professor of pharmacology who has been working in the field since the early 80s. Landing the UK in the 1970's from then-Rhodesia as a young man, in this series of Meet the Legends, Prof Nyazema talks about his professional life, what influenced and shaped his career and how he continues to contribute to ethnopharmacology in Africa. He is unique as one of the few academics who has also ventured far and wild into business because of both a sense of adventurism and activism.

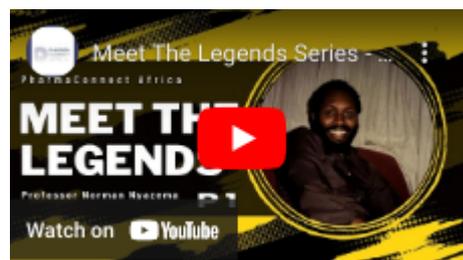


Professor Nyazema as a young activist



The Ethnopharmacologist

Click the image on the right to watch this interview



### Connect Conversations

#### *Herb Drug Interactions – What does the latest research show?*

The use of botanically derived substances is increasing globally. While many of these products are used as medicines for treatment of diverse pathological conditions; others are used as dietary supplements, nutritional supplements, natural health products or novel foods. According to a UNAIDS estimate, over 80% of Africans and one-third of the adults in developed countries use botanical products to treat or manage common ailments such as cold, inflammatory disorders, heart disease, diabetes, and central nervous system diseases. Often such products are used concomitantly with over-the-counter medicines available without prescriptions and with prescribed medicines thereby creating a potential for herb drug interactions. Interactions between botanical products and conventional drugs are frequently described in the medical literature based on studies using in vitro techniques. Herb-induced inhibition or induction of these pathways can alter the metabolism of drugs leading to adverse effects or lack of efficacy.

Speakers in this session will present their research findings demonstrating potential HDI risk associated with some of the well-known and widely used botanicals. In addition, they will discuss 21st century in silico and in vitro approaches for assessing HDI potential as well as best practices for conducting follow-up clinical studies.

#### Speakers

- Introduction - Dr Amy Roe, The Procter & Gamble Company
- In vivo cannabinoid-drug interactions-Prof Jash Unadkat, Department of Pharmaceutics, School of Pharmacy, University of Washington – (20 min)
- Mechanistic insight into the green tea - raloxifene interactions - Prof John Clarke, Department of Pharmaceutical Sciences, College of Pharmacy and Pharmaceutical Sciences Washington State University and Victoria Oyanna, Doctoral Student
- Gut on a chip: application to goldenseal-drug interactions Prof Kenneth Thummel, Department of Pharmaceutics, University of Washington and Chris Arian, Doctoral Candidate
- Herb Drug Interactions in selected African plants – Dr Kumbukani Nyirenda, Kamuzu University of Health Sciences
- Case studies from Nigeria - Prof Martins Emeje, National Institute for Pharmaceutical Research & Development (NIPRD), Nigeria
- Closing - Prof David Katerere, Tshwane University of Technology / PharmaConnect Africa.

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Enquiries/RSVP  
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### Upcoming Events

#### *Plant Migrations from Africa to the Americas During Slavery Times*

While there is a great deal of in depth research going on to improve our knowledge about the history, geography and economics of slavery during the 18th and 19th Century much less is being done to look at the transfer of plants from Africa to the New World that arose as a result of this mass migration across the Atlantic. These plants brought by slaves or slave owners have had a major impact on the life of people living in the Caribbean and southern states of America.

This talk organized by the African Wellness Initiative by AAMPS editor Denzil Phillips and Dr. Antony I Richards a leading Caribbean Biochemist will be held on November 15th

The African Wellness Initiative in association with the Spa and Wellness Association is inviting you to a scheduled Zoom meeting.

Time: Nov 15, 2022 10:00 AM Eastern Time (US and Canada)

Join Zoom Meeting by clicking the link below:

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Passcode: 078232

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