Traditional medicine is a form of alternative medicine which has been developed on the theories and experiences of varied cultures over centuries. Some of the prevalent practices of this field are acupuncture, Ayurveda, traditional Chinese medicine, etc. Studies of traditional medicine are done through the sciences of herbalism, ethnomedicine, ethnobotany and medical anthropology. This book is a compilation of chapters that discuss the most vital concepts and emerging trends in the study of traditional and natural medicine. Different approaches, evaluations, methodologies and advanced studies have been included in this book. Scientists and researchers will find it a valuable source of information and knowledge.

A concise overview of some of the findings and topics related to the pharmacology and clinical applications of traditional herbal therapeutics. It addresses the current and potential roles for herbal medicine in the context of our evolving healthcare systems. Introducing many pharmacological advances made, the work also describes the modern theories and scientific methodologies applied to today's studies on herbal medicines and new drug development.

Responding to the increased popularity of herbal medicines and other forms of complementary or alternative medicine in countries around the world, this reference reviews and evaluates various safety, toxicity, and quality-control issues related to the use of traditional and herbal products for health maintenance and disease prevention and treatment. With over 3,550 current references, the book highlights the role of herbal medicine in national health care while providing case studies of widely used herbal remedies and their effects on human health and wellness and the need for the design and performance of methodologically sound clinical trials for the plethora of herbal medicines.

Modern medicine has reached a point where the patient is not treated as a biopsychosocial-spiritual being but rather is seen as a virtual identity consisting of laboratory findings and images. More focus is placed on relieving the symptoms instead of curing the disease. Mostly, patients are turned into lifetime medication-dependent individuals. New medicines are needed to overcome the side effects, complications, resistance, and intolerance caused by pharmacological and interventional therapies. In hopes of drug-free and painless alternative treatments with fewer complications, there has been a trend to revisit traditional methods that have been dismissed by modern medicine. Traditional medicine has to be reevaluated with modern scientific methods to complement and integrate with evidence-based modern medicine. Medicinal plants are used to treat diseases and provide health benefits, and their applications are increasing around the world. A huge array of phytochemicals have been identified from medicinal plants, belonging to carotenoids, flavonoids, lignans, and phenolic acids, and so on, with a wide range of biological activities. In order to explore our knowledge of phytochemicals with the assistance of modern molecular tools and high-throughput technologies, this book collects recent innovative original research and review articles on subtopics of mechanistic insights into bioactivities, treatment of diseases, profiling, extraction and identification, and biotechnology.

This book introduces the methodology for collection and identification of herbal materials, extraction and isolation of compounds from herbs, in vitro bioassay, in vivo animal test, toxicology, and clinical trials of herbal research. To fully understand and make the best use of herbal medicines requires the close combination of chemistry, biochemistry, biology, pharmacology, and clinical science. Although there are many books about traditional medicines research, they mostly focus on either chemical or pharmacological study results of certain plants. This book, however, covers the systematic study and analysis of herbal medicines in general – including chemical isolation and identification, bioassay and mechanism study, pharmacological experiment, and quality control of the raw plant material and end products.

While biotechnological advances, genomics and high throughput screenings or combinatorial and asymmetric syntheses are opening new opportunities in drug discovery, the industry is facing serious innovation deficit. The total number of new molecules registered per year has dropped in contrast to expected increase. Post marketing failures of blockbuster drugs have become major concerns of industries. On the other side, globally there is a major shift to sue of traditional medicine involving complementary and alternative therapies. Ethnopharmacology and traditional medicines have contributed in past significantly in the process of natural product drug discovery. There are two clear tracks where ethnopharmacology has potential to contribute in future drug research. First, as a discovery engine to provide new targets, leads, and second, use of quality assured and standardized herbal medicines. In this scenario, it is important to understand the mechanisms of drug discovery and pharmaceutical development with a focus on herbal drugs and neutraceutical. This book provides historical perspective, future prospects and significance of ethnopharmacology in drug research. It also provides important steps in botanical drug discovery and development including bioprospecting, quality control, standardization, pharmaceutics, stability, pharmacokinetics, and bioavailability with examples from ethnopharmacology and herbal medicine. One of the important feature of this book is to give an excellent insight to Good Laboratory and Good Clinical Practices along with very useful summary steps involved in filing IND or NDA of botanical products. The book also gives Regulators' perspective of validating claims and how ethnopharmacological or traditional medicines need different approach.

This marvelous new book encourages natural prevention, treatment and healing. It is brilliant and comprehensive journal. The core focus of this most important volume is to liberate humankind from the pain and suffering of ill health. It is carefully written to guide men and women from all facets of society who are presently engaged in complementary medicine; freeing them from the limitations of synthetic and toxic applications of mainstream medical practice trends. Dr. Ubani's extensive knowledge and authentic expertise of natural medicine, homeopathy, African photo-medicine, nutrition and dietary therapy, is compounded in this spectacular revelation. These will educate the practitioners and laymen alike about the momentous necessity and importance of preventive therapy in our lives.
Herbal medicine is a multidisciplinary compilation of topics in herbal medicine that are designed to enlighten all who have a stake in healthcare. In light of the current trends and popularity of herbal medicine, cultural/societal differences and perception, and the relationship with modern healthcare this book presents selected topics to ensure that necessary information on herbal medicine in healthcare is provided. Apart from clarifying certain important complexities and misconceptions on herbal medicine, a general overview of herbal medicine, uses of herbs in the management of diseases, plant secondary metabolites, analytical techniques, applications in stem cell research, use as leads for conventional drug compound development, and research and development of herbal medicines for healthcare are among the major discussions in this book.

A Western-Based Approach to Analyzing TCMs In recent years, many pharmaceutical companies and clinical research organizations have been focusing on the development of traditional Chinese (herbal) medicines (TCMs) as alternatives to treating critical or life-threatening diseases and as pathways to personalized medicine. Quantitative Methods for Traditional Chinese Medicine Development is the first book entirely devoted to the design and analysis of TCM development from a Western perspective, i.e., evidence-based clinical research and development. The book provides not only a comprehensive summary of innovative quantitative methods for developing TCMs but also a useful desk reference for principal investigators involved in personalized medicine. Written by one of the world’s most prominent biostatistics researchers, the book connects the pharmaceutical industry, regulatory agencies, and academia. It presents a state-of-the-art examination of the subject for: Scientists and researchers who are engaged in pharmaceutical/clinical research and development of TCMs Those in regulatory agencies who make decisions in the review and approval process of TCM regulatory submissions Biostatisticians who provide statistical support to assess clinical safety and effectiveness of TCMs and related issues regarding quality control and assurance as well as to test for consistency in the manufacturing processes for TCMs This book covers all of the statistical issues encountered at various stages of pharmaceutical/clinical development of a TCM. It explains regulatory requirements; product specifications and standards; and various statistical techniques for evaluation of TCMs, validation of diagnostic procedures, and testing consistency. It also contains an entire chapter of case studies and addresses critical issues in TCM development and FAQs from a regulatory perspective. The era of globalization allows for more connectivity between nations and cultures. This increase in international association gives citizens more availability to take advantage of opportunities in other nations, such as medical assistance and accompanying services. Current Issues and Emerging Trends in Medical Tourism focuses on the emerging phenomena of international travel by patients in search of improved healthcare services and treatment, wellness programs, and complementary recreational activities. Including extensive coverage and case studies focusing on patient mobility and new opportunities for health services across borders, this authoritative reference source is essential to the needs of healthcare providers, nonprofit organizations, students, and medical professionals seeking relevant research on the relationship between global travel and access to healthcare. This publication features innovative, research-based chapters spanning the spectrum of medical travel issues including, but not limited to, customer perceptions, ethical considerations, reproductive medicine, social media use, family caregivers, organ transplants, human trafficking, and surrogacy concerns.

Chinese Herbal Medicine -- part of a larger healing system called Traditional Chinese Medicine (TCM), which also includes acupuncture, massage dietary advice and exercise. TCM is a popular method of treatment -- is actually called Chinese Drug Therapy in China because it uses a wide variety of substances and therapeutic modalities. Plant, animal and mineral substances are all included in the Materia Medica of Chinese Drug Therapy. The earliest uses date back at least 4000 years to the Shang dynasty. Characters representing medicinal substances have been found carved into oracle bone fragments. These were used diagnostically by the Wu Shaman of this time. The earliest materia Medica, the Sheng Nung Peng Tsao, recorded over 10,000 medicinal substances. While there seems to be an almost unlimited amount of medicinal substances, the most commonly used number around 200. Increased attention has begun being given to the field due to several factors: The apparent success stories in many cases; The failure of Western medicine in many disorders; and Realisation on the part of Western researchers that successful drugs can be designed on the basis of Chinese herbal drugs. This new book presents the latest research in the field.

International Encyclopedia of Public Health, Second Edition is an authoritative and comprehensive guide to the major issues, challenges, methods, and approaches of global public health. Taking a multidisciplinary approach, this new edition combines complementary scientific fields of inquiry, linking biomedical research with the social and life sciences to address the three major themes of public health research, disease, health processes, and disciplines. This book helps readers solve real-world problems in global and local health through a multidisciplinary and comprehensive approach. Covering all dimensions of the field, from the details of specific diseases, to the organization of social insurance agencies, the articles included cover the fundamental research areas of health promotion, economics, and epidemiology, as well as specific diseases, such as cancer, cardiovascular diseases, diabetes, and reproductive health. Additional articles on the history of public health, global issues, research priorities, and health and human rights make this work an indispensable resource for students, health researchers, and practitioners alike. Provides the most comprehensive, high-level, internationally focused reference work available on public health. Presents an invaluable resource for both researchers familiar with the field and non-experts requiring easy-to-find, relevant, global information and a greater understanding of the wider issues Contains interdisciplinary coverage across all aspects of public health Incorporates biomedical and health social science issues and perspectives Includes an international focus with contributions from global domain experts, providing a complete picture of public health issues Serum Pharmacology of Traditional Chinese Medicine: Technologies, Strategies and Applications provides a valuable and indispensable guide on the latest methods, research advances, and applications in this area. Chapters offer
cutting-edge information on pharmacokinetics and pharmacodynamics, analytical chemistry, traditional medicine, natural products, bioinformatics, new technologies, therapeutic applications, and more. For researchers and students in academia and industry, this book provides a hands-on description of experimental techniques, along with beneficial guidelines to help advance research in the fields of Traditional Chinese Medicine and drug development. Provides a valuable guide for practitioners of serum pharmacokinetics of Traditional Chinese Medicine, along with insights to its current use and future applications.

Edited and written by leading scientists at the forefront of this research, Presents well-written chapters that include an introduction, description of the method, and identification of chemical constituents, with applications and references to the latest research and literature.

Cancer is one of the leading death causes of human population increasingly seen in recent times. Plants have been used for medicinal purposes since immemorial times. Though, several synthetic medicines are useful in treating cancer, they are inefficient and unsafe. However, plants have proved to be useful in cancer cure. Moreover, natural compounds from plants and their derivatives are safe and effective in treatment and management of several cancer types. The anticancer plants such as Catharanthus roseus, Podophyllum peltatum, Taxus brevifolia, Camptotheca acuminata, Andrographis paniculata, Crateva nurvala, Croton tonkinensis, Oplopanax horridus etc., are important source of chemotherapeutic compounds. These plants have proven their significance in the treatment of cancer and various other infectious diseases. Nowadays, several well-known anticancer compounds such as taxol, podophyllotoxins, camptothecin, vinblastine, vincristine, homoharringtonine etc. have been isolated and purified from these medicinal plants. Many of them are used effectively to combat cancer and other related diseases. The herbal medicine and their products are the most suitable and safe to be used as an alternative medicine. Based on their traditional uses and experimental evidences, the anticancer products or compounds are isolated or extracted from the medicinally important plants. Many of these anticancer plants have become endangered due to ruthless harvesting in nature. Hence, there is a need to conserve these species and to propagate them in large scale using plant tissue culture. Alternatively, plant cell tissue and organ culture biotechnology can be adopted to produce these anticancer compounds without cultivation. The proper knowledge and exploration of these isolated molecules or products could provide an alternative source to reduce cancer risk, anti-tumorigenic properties, and suppression of carcinogen activities. Anticancer plants: Volume 1, Properties and Application is a very timely effort in this direction. Discussing the various types of anticancer plants as a source of curative agent, their pharmacological and nutraceutical properties, cryo-preservation and recent trends to understand the basic cause and consequences involved in the diseases diagnosis. We acknowledge the publisher, Springer for their continuous inspiration and valuable suggestions to improve the content of this book. We further extend our heartfelt gratitude to all our book contributors for their support, and assistance to complete this assignment. I am sure that these books will benefit the scientific communities including academics, pharmaceuticals, nutraceuticals and medical practitioners.

This two-volume publication sets out information on traditional, complementary and alternative medicines, revealing people's belief in and dependence on different traditional health systems around the world. The map volume provides a visual representation of topics including the popularity of herbal/traditional medicine, Ayurveda, Siddha, Unani, traditional Chinese medicine, homeopathy, acupuncture, chiropractic, osteopathy, bone-setting, spiritual therapies, and others; national legislation and traditional medicine policy; public financing; legal recognition of traditional medicine practitioners; education and professional regulation. The text volume covers developments in this diverse and expanding field of medicine in 23 countries across the world, as well as overviews of the status in each of the six WHO regions.

People have relied on medicinal products derived from natural sources for millennia, and animals have long been an important part of that repertoire; nearly all cultures, from ancient times to the present, have used animals as a source of medicine. Ingredients derived from wild animals are not only widely used in traditional remedies, but are also increasingly valued as raw materials in the preparation of modern medicines. Regrettably, the unsustainable use of plants and animals in traditional medicine is recognized as a threat to wildlife conservation, as a result of which discussions concerning the links between traditional medicine and biodiversity are becoming increasingly imperative, particularly in view of the fact that folk medicine is the primary source of health care for 80% of the world's population. This book discusses the role of animals in traditional folk medicine and its meaning for wildlife conservation. We hope to further stimulate further discussions about the use of biodiversity and its implications for wildlife conservation strategies.

The third edition of the unparalleled reference on natural ingredients and their commercial use This new Third Edition of Leung's Encyclopedia of CommonNatural Ingredients: Used in Food, Drugs, and Cosmetics arrives the wake of the huge wave of interest in dietary supplements and herbal medicine resulting from both trends in health and the Dietary Supplement and Health Education Act of 1994 (DSHEA). This fully updated and revised text includes the most recent research findings on a wide variety of ingredients, giving readers a singesource for understanding and working with natural ingredients. The Encyclopedia continues the successful format for enries listed in earlier editions (consisting of source, description, chemical composition, pharmacology, uses, commercial preparations, regulatory status, and references). The text also features an easily accessible alphabetical presentation of the entries according to common names, with the index cross-referencing entries according to scientific names. This Third Edition also features: More than 50 percent more information than the Second Edition, reflecting the greatly increased research activity in recent years A new section on traditional Indian medicine, with information on nine commonly used herbs More than 6,500 references Two new appendices explaining and illustrating the botanical terminology frequently encountered in the text A revised and expanded index Leung's Encyclopedia of Common Natural Ingredients: Used in Food, Drugs, and Cosmetics, Third Edition will continue to provide a comprehensive compilation of the existing literature and prominent findings on natural ingredients to readers with an interest in medicine, nutrition, and cosmetics.

Evidence-Based Validation of Herbal Medicines, second edition brings together current thinking and practice in the areas
of characterization and validation of natural products. This book reviews all aspects of evaluation and development of medicines from plant sources, including their cultivation, collection, phytochemical and phyto-pharmacological evaluation, and therapeutic potential. Emphasis is placed on describing the full range of evidence-based analytical and bio-analytical techniques used to characterize natural products, including -omic technologies, phyto-chemical analysis, hyphenated techniques, and many more. This thoroughly updated new edition covers several aspects of evaluation and development of newer drugs from medicinal plants and evaluation of their therapeutic potential together with their evidence-based validation. It addresses the possible difficulties in the field of natural product research at large. It highlights various aspects of quality control parameters, safety evaluation and therapeutic efficacy. It focuses on better understanding hyphenated state-of-the-art technologies including NMR, IR, HPTLC, HPLC, UPLC, LC-MS and others. It contains the latest research from eminent scientists and researchers around the globe on several aspects of translational research on the evaluation of herbal medicine, and it serves as a useful bioprospecting tool for traditional-medicine-inspired drug discovery and development. Includes state-of-the-art methods for detecting, isolating, and performing structure elucidation by degradation and spectroscopic techniques Highlights the trends in validation and value addition of herbal medicine with different scientific approaches used in therapeutics Contains several all-new chapters on topics such as traditional-medicine-inspired drug development to treat emerging viral diseases, medicinal plants in antimicrobial resistance, TLC bio profiling, botanicals as medicinal foods, bioprospecting and bioassay-guided isolation of medicinal plants, immunomodulators from medicinal plants, and more

The Sri Lankan medicinal system predominantly utilizes herbs and spices for the treatment of various ailments. This is mostly because Sri Lanka is a tropical country, a biodiversity hot-spot blessed with a plethora of flora and fauna. Traditional Herbal Remedies of Sri Lanka looks at the traditional medicinal practices of the country that utilize plant material from a cultural, philosophical and scientific perspective. When it comes to the scientific aspects, several Sri Lankan herbs have been in the spotlight for possessing bioactive constituents with promising therapeutic effects. It is hoped that these will be considered as strong candidates to combat currently prevailing global disease conditions. Key Features: Reveals the science behind the traditional wisdom passed down in Sri Lanka’s long history of using herbal medicines Emphasizes the increasing global interest in botanical drugs Reviews the hot topic of Sri Lankan herbs, which possess bioactive constituents and have promising therapeutic effects Aids the international natural product communities to better understand the herbal resources in Sri Lanka

Bioactive natural products are proving to be a rich source of novel therapeutics to both protect against and combat diseases, as well as serve as lead compounds in crop protection. Following the successful format of the first edition, this volume brings together collective research from many new contributors and emphasizes the rationale behind the Trends in Traditional Medicine ResearchProceedings of the International Conference on the Use of Traditional Medicine & Other Natural Products in Health Care, 8th-11th June 1993, Penang, MalaysiaChinese Herbal Drug Research TrendsNov Publishers Interactions Between Chinese Herbal Medicinal Products and Orthodox Drugs provides basic biomedical principles on adverse and beneficial interactions between Chinese herbal medicine (CHM) products (herbs and ready-made medications) and orthodox drugs. The book includes concise accounts of the trends of development and progress in Chinese medicine, pharmacological principles of CHM materials and mechanisms of interactions. Clinically relevant interactions are summarized in tables for easy reference with a catalogue of commonly used CHM products. A unique chapter with an action plan is assigned to promote research and documentation of herb-drug interactions. This textbook is desperately needed by undergraduates, postgraduates, medical practitioners, health professionals, medications regulatory bodies, and R&D professionals in pharmaceutical industries who are involved in CHM products.

Herbal Medicine in Andrology: An Evidence-Based Update provides a comprehensive overview of ethnomedical approaches in andrology, including ethnopharmacology of plant extracts and relevant bioactive compounds. It highlights information on the availability of medicinal plants and the legal and procedural processes involved in developing a marketable product. This reference helps clinicians and scientists develop an understanding on how herbal medicine can be used to treat andrological patients in practice. Only a limited number of journal articles are available on this topic, making this reference a valuable source of information for a large audience, including urologists, andrologists, gynecologists, reproductive endocrinologists and basic scientists. Provides essential evidence-based information about herbal medicine Offers an ethnopharmacological background on bioactive compounds in certain plant extracts Educates the basic scientist and clinician on the use of herbal medicines in andrology Provides an update to recent advances on herbal medicine in andrology from world experts

Did you know there's a powerful herbal medicine chest in your kitchen? Imagine being prepared for that next cold, scrape, headache, digestive issue, stressful day, or sleepless night with simple ingredients from your cupboard. Instead of pills, reach for:Cinnamon Tea to soothe your throat . . . Garlic Hummus to support your immune system . . . Ginger Lemon Tea for cold and flu symptoms . . . Cayenne Salve to relieve sore muscles . . . Cardamom Chocolate Mousse Cake for heart health . . . A glass of Spiced Cold Brew Coffee as a powerful antioxidant . . . Alchemy of Herbs will show you how to transform common ingredients into foods and remedies that heal. What were once everyday flavorings will become your personal kitchen apothecary. While using herbs can often seem complicated or costly, this book offers a way to learn that's as simple and inexpensive as cooking dinner. With the guidance of herbalist Rosalee de la Forêt, you'll understand how everyday flavorings will become your personal kitchen apothecary. While using herbs can often seem complicated or costly, this book offers a way to learn that's as simple and inexpensive as cooking dinner. With the guidance of herbalist Rosalee de la Forêt, you'll understand how
The book provides an overview of current trends in biotechnology and medicinal plant sciences. The work includes detailed chapters on various advance biotechnological tools involved in production of phytoactive compounds of medicinal significance. Some recent and novel research studies on therapeutic applications of different medicinal plants from various geographical regions of the world have also been included. These studies report the antimicrobial activity of various natural plant products against various pathogenic microbial strains. Informative chapters on recent emerging applications of plant products such as source for nutraceuticals and vaccines have been integrated to cover latest advances in the field. This book also explores the conservation aspect of medicinal plants. Thus, chapters having comprehensively compiled in vitro conservation protocols for various commercially important rare, threatened and endangered medicinal plants were provided in the present book.

Malaria is an increasing worldwide threat, with more than three hundred million infections and one million deaths every year. The world's poorest are the worst affected, and many treat themselves with traditional herbal medicines. These are often more affordable and affordable, and sometimes are perceived as more effective than conventional antimala.

The book's inherent value, currently, is in its uniqueness. There are few books on Integrative Oncology (IO). There are few books on the entirety of traditional Chinese medicine in the treatment of cancer. There are even fewer, if any, books that deal with the topics of Integrative Oncology and the use of traditional Chinese medicine as a whole in the treatment of people with cancer. While very broad and deep topics, this makes for a varied audience of interest that includes not just the TCM practitioner or student, but Western health practitioners and patients as well as laypeople interested in the topic of oncology. For those interested in the topic of IO, it gives one of the few non-biased, honest and critical views of the state of IO in contrast to what is promoted by various institutions and societies. For the Western health practitioner and/or patient, many of whom are completely unfamiliar with TCM and how it works or can be used, it provides information on the breadth of TCM and how it can be applied in various ways to help improve outcomes. For the TCM practitioner or student, it provides much needed information on how to go about caring for a patient with cancer to include clinical pearls and important Western medical information and terminology.

Providing the latest coverage on emerging and re-emerging diseases from around the world, such as tuberculosis and malaria, this updated guide contains boxes and tables that highlight key information on current therapies. This edition includes online access for more information.

This report is structured in five parts: national framework for traditional and complementary medicine (T&CM); product regulation; practices and practitioners; the challenges faced by countries; and, finally, the country profiles. Apart from the section on practices and practitioners, the report is consistent with the format of the report of the first global survey in order to provide a useful comparison. The section on practices and practitioners, which covers providers, education and health insurance, is a new section incorporated to reflect the emerging trends in T&CM and to gather new information regarding these topics at a national level. All new information received has been incorporated into individual country profiles and data graphs. The report captures the three phases of progress made by Member States; that is, before and after the first WHO Traditional Medicine Strategy (1999-2005), from the first global survey to the second global survey (2005-2012) and from the second survey to the most recent timeline (2012-2018).

While there is talk of the Fourth Industrial Revolution, old and new challenges bedevil the world – climate change, nutrition, and health poverty being at the top of the list. In seeking solutions to these and other problems which afflict the modern era, it is worthwhile to look into our collective past, to the traditions and knowledges of our ancestors. Such knowledge continues to exist in many parts of the world, though now marginalized by homogenous, Eurocentric ontology and epistemology. This book presents a compilation of reviews, case studies, and primary research attempting to locate the utility of traditional and Indigenous Knowledges in an increasingly complex world. It assembles chapter authors from across the world to tackle topics ranging from traditional knowledge-based innovations and commercialization, traditional medicine systems as practiced around the world, ethnoveterinary practices, and food innovation to traditional governance and leadership systems, among others. This book is an important resource for policymakers, scholars and researchers of cultural studies, leadership, governance, ethnobotany, anthropology, plant genetic resources and technology innovation; and readers interested in the history of knowledge and culture, as well as cultural activists and political scientists. Features: Unique combination of social science and anthropological aspects with natural science perspectives Includes summaries aimed at policymakers to immediately see what would be relevant to their work Combines case studies illuminating important lessons learned with reviews and primary data Multidisciplinary in the scope of the topics tackled and assemblage of contributors Global footprint with contributions from Africa, Europe, North America, Asia, and the West Indies David R. Katerere, Department of Pharmaceutical Sciences, Tshwane University of Technology, South Africa Wendy Applequist, William L. Brown Center, Missouri Botanical Garden, St Louis, Missouri Oluwaseyi M. Aboyade, Department of Pharmaceutical Sciences, Tshwane University of Technology, South Africa and Nutritica SA, The Innovation Hub, Pretoria, South Africa Chamunorwa Togo, The Innovation Hub, Pretoria, South Africa

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