

The future of healthy ageing

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and innovative solutions
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by Charlotte Bastiaanse

Consumers are aware that life expectancy is increasing, and the goal is generally to maintain optimal physical and mental health for as long as possible. More people are taking a proactive approach to protecting those values, and preventing—or at least reducing—age-related dysfunctions such as joint discomfort, memory loss, fatigue and other more hedonistic aspects like wrinkle reduction and physical fitness. Consumers are leading this change through improved lifestyle habits as well as greater attention to nutritional needs.

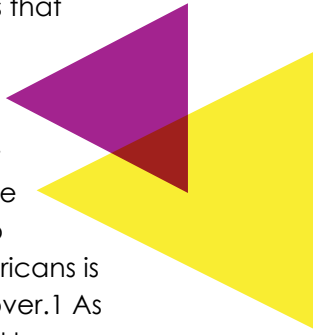
Across all sectors of the population, driven in part by dissatisfaction with the healthcare system, consumers are experiencing a renewed sense of self-responsibility and taking back control of their wellbeing decisions. With healthy ageing promoted to even the youngest of generations, brands and manufacturers are redefining the 'ageing' target market.

Today's ageing consumer

Longer life expectancy creates opportunities for individuals to pursue new

activities and make valuable contributions to family and society. However, it also means that age-related health conditions are more common, requiring new approaches. Today's ageing consumers are looking for natural, science-backed solutions that can improve their quality of life without negatively affecting their lifestyle, says Moran Werner Saido, product manager at IFF Health.

Although Millennials often garner the most attention, Hannah Ackerman (registered dietician and corporate communications manager at Comet Bio) reminds us that the Baby Boomer generation represents a sizeable portion of the global population. Looking at the United States, she notes that as Baby Boomers enter their next life phase, demographics are going to change—by 2030, one-in-five Americans is projected to be 65 years old and over.¹ As generational distribution shifts, it will become increasingly important for food and beverage manufacturers to anticipate the unique





health demands of consumers at different life stages. “Baby Boomers are already taking a more proactive approach in maintaining their health than previous generations, says Ackerman, and we see them actively seeking preventative options to help delay age-related declines in body form and function.

Mariko Hill, product development executive at Gencor, echoes this approach, sharing that healthy ageing is of increasing concern to younger generations who want to age well and be ahead of the curve in comparison to their parents and grandparents. Consumers are more understanding of the inevitable age-related decline in health—including the natural decline in testosterone levels, calcium and palmitoylethanolamide (PEA) after the age of 30, influencing strength, bone health and pain respectively.

Prominent areas of concern

As the hormones that support the function of the human body and mind decline as we age, retaining cognitive function remains a key priority for seniors striving to hold onto their independence. “Our body has the ability to compensate for lower hormone levels in the beginning that maintain the essential function of our body and mind,” explains Professor Jian Guan, but this ability reduces as we age. Greater awareness and personal responsibility has led to increased demand for brain performance solutions for senior and younger populations.

According to independent research

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conducted on over 1,000 individuals over the age of 50, seniors most value staying active, mobile and independent as they age, says Max Gowland, Ph.D., founder of the tailored healthy ageing brand, Prime Fifty. Seniors realise that it is possible to extend health and ‘health span’ through exercise and good nutrition, but they also understand that meeting recommended daily allowances (RDA) is nearly impossible in today’s food climate, he observes. National Food Intake

studies confirm that the over 50s population lacks many key micronutrients in terms of just hitting the RDA which in reality is a minimum.

In the skincare space, the ‘blue beauty’ movement—centered on sustainable practices—has inflated as consumers draw attention to the impact of harmful chemicals and packaging on marine ecosystems, says Laurentia Guesman, product manager for carotenoid formulations at Lycored. “With topical skincare products such as sunscreen strongly implicated in damage to coral reefs, the ingestible skincare sector can tap into the growing demand for blue beauty, and environmental awareness more generally,” she adds.

Sun-Ho Frank Kim, Ph.D., highlights the growing opportunity to provide non-pharma solutions that address prostate health for men and menopause for women. Current raw materials and ingredient sources are extremely limited, and industry stakeholders and consumers alike are eager to expand their choices, says Kim.



Additionally, and emphasised now more than ever under lockdown circumstances, eye health and weight management will emerge as even stronger concerns. With screen time soaring and reduced physical activity, Mariana Ortega, marketing associate at Pharmactive Biotech Products, perceives a growing opportunity to target these areas through natural products.

Of course, we cannot ignore how the ongoing COVID-19 pandemic will impact product development in the immune health category—especially as R&D experts seek to tailor solutions targeted at the vulnerable population. There is an established link between microbiome health and overall immunity, and Ackerman shares that older consumers are increasingly looking for ways to maintain their digestive health, such as by incorporating prebiotic and probiotic dietary fibre into their diet that supports the growth of good bacteria.



Providing visibility into manufacturing

Across multiple sectors and industries, consumers of all ages are becoming more aware that the product choices they make influence the environment and/or their body in one way or another. However, Andrea Zangara, head of scientific communication and marketing at Euromed, notes that younger consumers tend to investigate in more detail.

Although consumers take an interest in both sustainability and top-line marketing, the most important thing for a brand to respect is product quality as they may risk losing repeat purchasers, says Hill.

Teresa Negra, product development manager (nutraceutical division) at Lubrizol Life Science Health observes that consumers also want to understand aspects related to a

product's production techniques, the origin and provenance of its ingredients, as well as the ethical and environmental benefits. As a result, she notes clean label, botanical, and eco-certified products are increasing their market share.

In efforts to meet this expectation, food and beverage producers have invested in funding research and development projects to exercise sustainable practices. Upcycled ingredients—leveraging materials that would otherwise go to waste—are resonating well with supply chain customers and end consumers, says Ackerman. She shares: "Comet Bio recently performed a consumer research study that found that 42% of consumers believe that reducing food waste is a reason to purchase healthy and sustainable products. That same study found that consumers believe taste (56%) and products that are good for their wellbeing (60%) are also very important factors."

Emerging ingredients

A number of well-documented and researched ingredients offering healthy ageing benefits are coming to market, providing manufacturers with the opportunity to diversify product ranges, exciting supply chain stakeholders and end consumer.

As Guan notes that recent cyclic Glycine-Proline (cGP) research and clinical trial results support New Zealand blackcurrant's potential to prevent age-related decline in cognitive function and maintain normal blood pressure. The biological function of cGP is mediated through regulating IGF-1 function and shares the mechanism of IGF-1 which has been well researched in literature generated over the past 50 years, explains Guan, and the effects of cGP in improving vascular circulation through normalising the function of IGF-1 has been well documented in the last 20 years.

Kim highlights flower pollen extract, which exhibits properties that target prostate health

in men, and menopause health for elderly women thanks to various sterol compounds obtained from lipophilic fraction, as well as various amino acids and derivatives obtained from hydrophilic fraction. Flower pollen extract has applications in pharmaceuticals, nutritional supplements, functional foods and skin care products, with health claims including men's prostate health, urinary health, liver support and women's health.

One of the newer ingredients on the market is aged black garlic, which has traditionally been used in Japanese cuisine but has now made its way to the nutraceutical world, thanks to its high antioxidant and cardioprotective activity. "Additionally, its organoleptic properties have also helped make it one of the newest extracts in the healthy ageing category," Ortega says.

Damage associated with oxidative stress remains a key area of concern among ageing consumers, and there is established interest in antioxidant ingredients that prevent the cumulative tissue degradation process that occurs with age, says Negra. She adds that a plethora of research backs astaxanthin as one of the most powerful antioxidants on the market, and there are also studies on its neuroprotective action thanks to its ability to cross the blood-brain barrier and exert its antioxidant and inflammatory properties

within the brain. Its beneficial effect on the circulatory system also help to maintain central nervous system function.

While olive leaves

“Flower pollen extract has applications in pharmaceuticals, nutritional supplements, functional foods and skin care products.”

have been used as a traditional remedy for inflammation, heart health and blood sugar support for thousands of years, Saido states olive oil polyphenols such as oleuropein and hydroxytyrosol are valued for their antioxidant and anti-inflammatory effects. Furthermore, the European Food Safety Authority (EFSA) has approved the claim that 'olive oil polyphenols contribute to the protection of blood lipids from oxidative stress,' and studies on oleuropein have revealed antithrombotic, antiatherogenic and vasodilatory properties.

Saido also highlights bladder problems, such as urinary incontinence, as among the most common chronic conditions in ageing populations. "There are very few natural solutions for bladder wellness on the market, but one that does exist can be found in the humble pumpkin." Pumpkin seeds (*cucurbita pepo* L.) were traditionally used by the Native Americans to facilitate the passage of urine and they have been an integral part of European Herbal Medicine since 1539, she adds. The activity has been confirmed in clinical studies.

Gowland outlines that although well-known and long established, probiotics, omega-3, resveratrol, vitamin D, collagen and CoQ10 remain current and popular ingredients for healthy ageing product development. Notably, Gowland highlights BioPerine—a patented black pepper extract manufactured by Sabinsa—which has been proven to enhance micronutrient absorption in the gut, and therefore utilised in Prime Fifty



formulations for this reason.

Considering botanical ingredients, Zangara cautions: "There could be ample difference between extracts from the same plant, but developed by different producers. The standardisation of the right active components, as well as many other factors involved in the process from the seeds to the finished extract (including soil condition, time of harvest, parts used, solvents used), can impact clinical outcomes, safety, efficacy. For example, a pomegranate extract high in ellagic acid and low in punicalagins, may provide less cardiovascular benefits than one high in punicalagins and low in ellagic acid (the pure fruit concentrate)."

New delivery formats

Not only are manufacturers seeking new and innovative ingredients for healthy ageing, but consumers—especially seniors—are seeking new ways to meet their nutritional needs through alternative delivery formats. There is a resounding theme of pill fatigue across market sectors—and tablet/capsule formats become particularly challenging when a person starts to experience discomfort swallowing.

Dysphagia, poor oral health, and malabsorption are all

factors that become more prevalent in elderly individuals, says Hill. Convenient formats such as effervescent, gels and gummies are providing alternative solutions for this particular demographic. Hill adds that with the advances of science and innovative delivery technologies, companies are now able to deliver formats that help disperse ingredients in cold-water and/or become homogenised in formulations.

Ackerman also emphasises the need for formats that help the ageing population to increase their liquid intake. "Finding convenient ways to stay hydrated is increasingly vital as we age as the body's ability to register thirst declines after approximately age 65," she says.

"Sprays are interesting, but they tend to lack ability to deliver enough of an active ingredient," says Gowland. "Liquid shots, such as gels, are an excellent delivery format but they tend to be more expensive per dose so brands need to be mindful of the impact to cost too."

Finally, there's wide room to innovate formats in the ingestible skincare sector, says Guesman. "Capsules, tablets and soft gel formats have long been the main delivery systems in the supplement space. However, ready-to-drink beverages, powder mixes, and concentrated tonics or elixirs are emerging as exciting alternatives."

Regulation and health claims

Longer life expectancy leads to a higher prevalence of chronic diseases, many of which can be prevented, delayed, or mitigated by society leading healthy lifestyle habits, including good nutrition and nutritional balance. Nutraceuticals as well as personalised nutrition can certainly help to support a healthy ageing, says Negra, but regulation undoubtedly represents a notable challenge—not only for the approval of new ingredients but also for global commercialisation. Nutraceuticals have a different definition between different

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countries, and approval requests should be placed following each country or region's requirements.

Generally, ingredients have an extensive research base, but many of the approved claims are limited to micronutrients in specific quantities, says Ortega, making this a challenging entry point for manufacturers seeking to make an on-pack or online claim. For that reason, manufacturers often formulate products featured with ingredients that have permitted health claims.

According to Kim, looking at the process of producing and selling healthy functional food can be largely divided into three stages: raw material, production, and sales. Most regulations are not far outside the scope of these three stages. "If you look at the characteristics of regulations on functional food by country—the production stage, that is—the regulation on the finished product is high, and the regulation on raw materials and the regulation on display and advertisement are different depending on the classification of the finished product," he says. Kim also

perceives that, although it may differ from country to country, regulatory intervention has a proportionate relation to

consumer interest. If we see a spike in consumer interest in raw materials, regulation of raw materials may well tighten up.

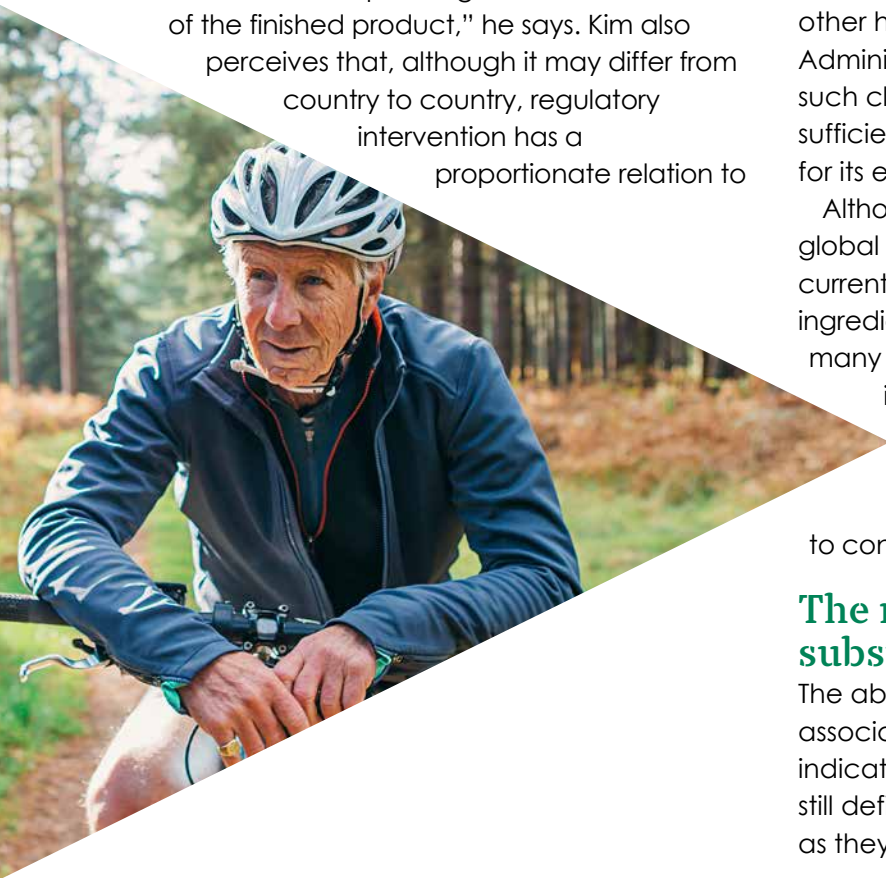
"In Europe, a main concern is the technical wording of health claims which fails to translate into meaningful and understandable consumer language," says Gowland. He highlights probiotics, which still lack European Food Safety Authority (EFSA) approval despite the vast amount of research that big blue-chip suppliers have poured into this area—blocking the potential benefit that these products could bring to millions of consumers who battle digestive health issues.

Adding to European framework, Hill says claims for botanicals and other select ingredients are not permissible if not listed under the list of health claims permitted by the European Commission. Therefore, manufacturers use such ingredients in conjunction with various vitamins and minerals that have a general function health claim, such as vitamin C for joint health, in order to achieve a package claim. On the other hand in the U.S., the Food and Drug Administration (FDA) allows brands to make such claims if the ingredient used has sufficient clinical evidence proving efficacy for its end benefit.

Although we are gradually moving toward global harmonisation, Zangara emphasises the current challenge to be able to produce ingredients that can be introduced to as many markets as possible. "Other concerns include whether an ingredient may be considered novel and if achieving Generally Recognized as Safe (GRAS) status is necessary or beneficial to confirm ingredient safety."

The need for clinical, substantiated research

The abundance of 'epi studies' and association studies are considered only indicative—with randomised controlled trials still defined as the gold standard of science as they limit the factors that may influence



study results. "Meta-analyses are even better in combination with systematic reviews, but these too can be flawed unless carried out with real statistical expertise," says Gowland.

Conducting a clinical trial should be an integral component of a product development plan as it can provide valuable product specific data from which health claims or other business decisions can be made—in addition to supporting marketing—Zangara says. There are obvious differences and limitations when comparing human studies with food ingredients, to clinical trials for pharmaceutical drugs. Food clinical studies for instance tend to focus more on healthy subjects than patients, he explains. "The tested compound should be well identified, the dosage investigated should correspond with suggested dosages, and the trial population should relate to the intended target." The guidelines of the EFSA provide a solid framework, but Zangara notes the

reasons stated for rejecting a study by EFSA include a poor study design, incorrect target population or product, and non-pertinent marker or

data analysis.

In addition to consumers, prescribers are increasingly demanding information about ingredients.

Functionality, health benefits, enhanced bioactivity and bioavailability must be supported by a scientific approach, says Negra. "This not only refers to new ingredients and delivery formats, but also to those ingredients that have been known for centuries and are used as traditional

remedies, such as Traditional Chinese and Ayurvedic medicine," she says. As an example, Negra adds that products such as turmeric have experienced improvements in their solubility and bioavailability through microencapsulation systems, as demonstrated by comparative scientific studies that demonstrate their better absorption at the intestinal level compared to the raw ingredient. Trial design should consider multiple specific variables for each type of study. With specific reference to the ingredients for healthy ageing and depending on the product and the disease to prevent, it could be essential studies to evaluate them in the short term, but also as a chronic intake. In any case, the design of clinical studies must be tailored for each health benefit and target population.

On the horizon

So, what's next for the healthy ageing category? Kim highlights that even major developed countries are experiencing rising medical costs associated with a rapidly growing ageing society. He forecasts that the future of innovative solutions for seniors will be non-pharma intervention, with necessary perception changes taking place at consumer and policy offer level.

Guesman highlights the exciting potential for further synergy between different ingredients. As an example, she offers the collagen and carotenoids combination: "Consumers understand collagen's benefits and have long integrated it into their beauty routines—now they're looking for new ingredients that can support it. Carotenoids, which help influence overall skin appearance and even balance skin's natural collagen levels, are the perfect partner."

While there are without doubts many exotic and novel botanicals that could be investigated for healthy ageing benefits, innovation can also take inspiration from local fruits and vegetables, representative of

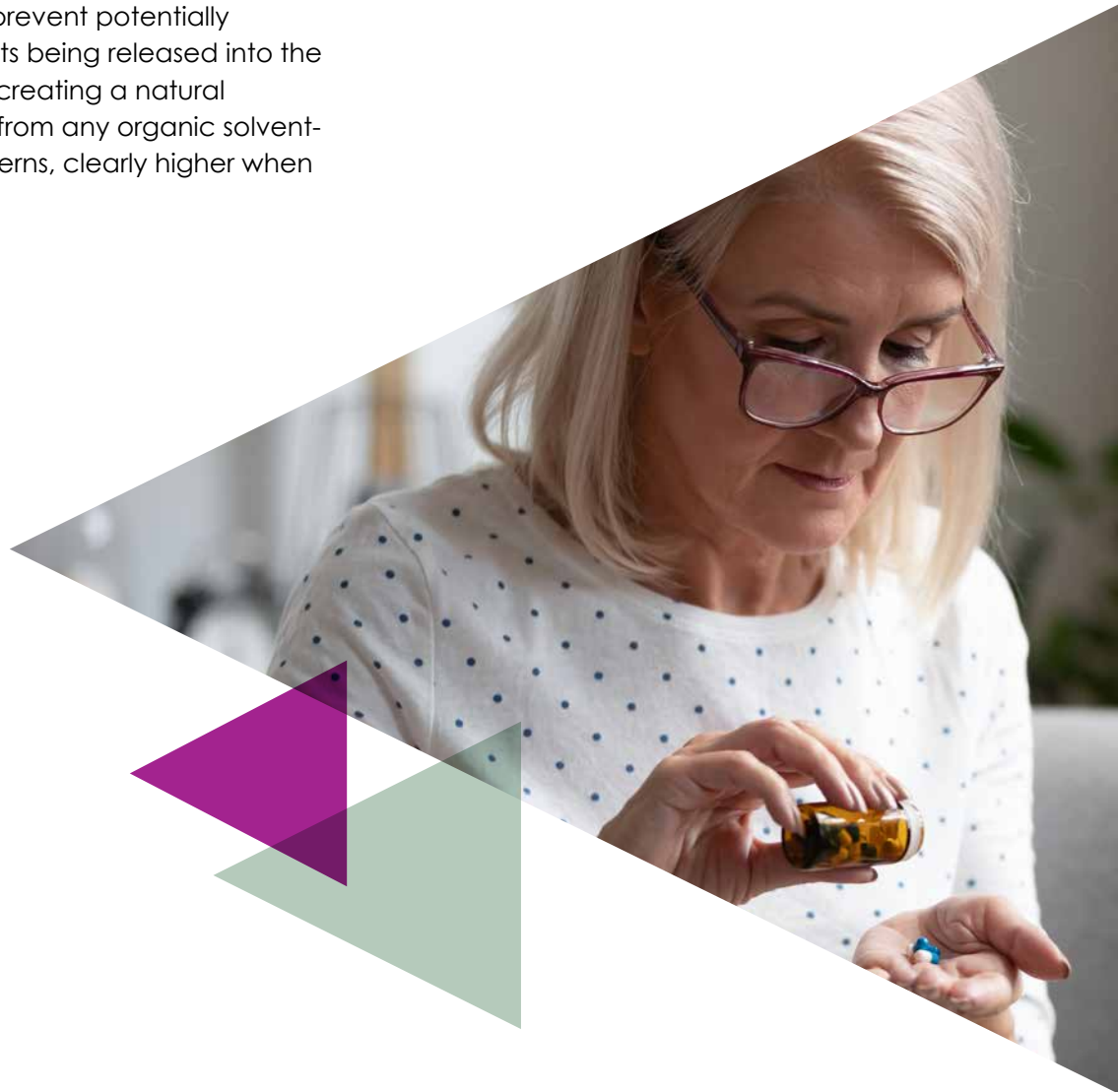




healthy dietary traditions, says Zangara. In the case of Euromed, located in Spain, the company found inspiration for safe and effective ingredients obtained from sources that are staple in the Mediterranean diet and scientifically recognised for healthy ageing values. Innovation includes also the way ingredients are obtained, he says, and 'green' extraction techniques such as with purified water can prevent potentially contaminant solvents being released into the environment, while creating a natural product that is free from any organic solvent-related safety concerns, clearly higher when

targeting the ageing population.

Emphasis on preventative health and age-inclusive solutions will drive new opportunities for the food industry to help consumers adopt dietary habits that will later prove key in preventing dietary-related diseases in later life.



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Biographies

HANNAH ACKERMANN, CORPORATE COMMUNICATIONS MANAGER, COMET BIO

A registered dietitian, Ackerman uses her expertise in food and nutrition to help Comet Bio educate consumers and tell its ingredient story. Before joining Comet Bio, Ackerman worked in nutrition communications at leading global market research and public relations firms. She holds bachelor's degrees in nutritional science and journalism from Indiana University, Bloomington and an MBA in marketing from Dominican University, Chicago.

MAX GOWLAND, PH.D., FOUNDER AND MANAGING DIRECTOR, PRIME FIFTY

Dr Gowland founded the company dedicated to helping the over 50s stay active via targeted nutritional supplements, specifically formulated for the ageing metabolism. He holds a doctorate in amino acid biochemistry from Nottingham University. Starting his career at Procter & Gamble, he then went on to become global R&D director for Reckitt Benckiser before joining Jeyes Group as their chief innovation officer. Dr Gowland was managing director of a sports nutrition company, after which he then decided to start his own business, Prime Fifty Ltd, dedicated to the health and wellbeing of the over 50s.

JIAN GUAN, M.D., PH.D., ASSOCIATE PROFESSOR, UNIVERSITY OF AUCKLAND

Dr Guan completed a bachelor of medicine at Wuhan University, China, in 1982, and then a doctorate in paediatrics at Auckland University, New Zealand in 1996. Her studies discovered the function and mechanism of insulin-like growth factor-1 (IGF-1) in preventing stroke injuries and promoting stroke recovery. In the last 25 years, her research has continued the same line of

research in Auckland University as a Research Fellow, Senior Research Fellow and Associate Professor affiliated with the Liggins Institute and with the Pharmacology and Clinical Pharmacology, the Faculty of Medical and Health Sciences. Amongst all published journal articles, she has primary authorships (first or correspondent and senior authorships) in more than 70% of them. She is the inventor of 14 granted international patents.

LAURENTIA GUESMAN, PRODUCT MANAGER, CAROTENOID FORMULATIONS, LYCORED

Guesman is a health and wellness enthusiast with industry experience specialising in natural, plant-based beauty from within, as well as topical products. Her background includes work in product development, R&D, sensory analysis and manufacturing scale up and logistics.

TERESA NEGRA, NEW BUSINESS DEVELOPMENT MANAGER, NUTRACEUTICAL DIVISION, LUBRIZOL LIFE SCIENCE HEALTH

Negra has over 25 years' experience in food ingredients, starting her career as a technical advisor on food quality and ingredient applications. She holds a bachelor's in veterinary science, specialised in food science and food technology (from UAB), doctorate studies in nutrition, food technology and food hygiene (from UAB) and, most recently, a master's in marketing and communication (from UOC).

MARIKO HILL, PRODUCT DEVELOPMENT EXECUTIVE, GENCOR

With knowledge in the field of nutrition and further experience as a research fellow from the University of Oxford, Hill is responsible for innovation, new product development, and business development at Gencor.

Biographies

SUN-HO FRANK KIM, PH. D., OWNER AND PRESIDENT, SEAH BIO SOLUTION

Dr Kim has a doctorate and honours degree in biomaterial science and technology from Yonsei University and is currently the owner and president of SEAH bio solution based in Seoul, Korea. He has over 29 years of experience in R&D, technology-oriented marketing, sourcing in pharma, nutraceuticals and food technology. He has collaborated on a Novel Drug Development project for diabetes mellitus for the Asahi-Kasei Corporation, Japan, before assuming positions introducing new nutraceutical ingredients to European and Japanese markets.

MARIANA ORTEGA, MARKETING ASSOCIATE AT PHARMACTIVE BIOTECH PRODUCTS, S.L. TBC

Qualified as a human nutritionist from University of Pablo de Olavide (Spain) and University stay at Pavia (Italy), Ortega is an enthusiast of natural medicine and its power to transform health and wellbeing. After further qualifications from the University CEU San Pablo, Spain, she has become a marketing and business management expert within the life sciences and pharmaceutical industries.

MORAN WERNER SAIDO, PRODUCT MANAGER, IFF HEALTH

Saido is a biomedical specialist, and holds a BSc in biotechnology and an MBA.

ANDREA ZANGARA, HEAD OF SCIENTIFIC COMMUNICATION AND MARKETING, EUROMED

Zangara joined Euromed in 2017 and holds a master's in phytotherapy (University of Barcelona), as well as more than two decades' experience in pharmaceutical and nutraceutical sectors with positions in both academia and industry. Zangara is adjunct research fellow at Swinburne University, Australia, and collaborates with ESCOP and other international expert groups focusing on quality control in herbal medicines. He is author and co-author of several research papers, review articles, book chapters or books.





Q&A



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<http://www.euromed.es/euromed-video/>

1 What types of ingredients and /or ingredient systems does your company offer into the “healthy ageing” space?

Our black cohosh extract is indicated for relieving menopause symptoms, while Prosterol®, our saw palmetto extract, and our pygeum extract, support prostate health. For a preventative approach to cardiovascular, metabolic, digestive, and other age-related concerns, we offer our line of Mediterranean Fruit & Vegetables Concentrates: inspired by the healthy ageing benefits of the Mediterranean diet, pomegranates, olives, artichokes, and figs are gently processed with only osmotized water as solvent, to obtain Pomanox®, Mediteanox®, Cynamed™ and ABAlife®.



EUROMED
 Standardized Botanical Extracts



2 Can you offer some insight into the scientific research and substantiation around your ingredients for their specific effects on different aspects of ageing?

We have an aggressive research agenda on our proprietary extracts. Prosterol® was compared *in vitro* to enlarged prostate standard drug finasteride, and found to work in the same way and just as well (Res Rep Urol. 2016;8, 1-9). Clinical studies with Pomanox® found a consistent lowering of blood pressure and, in combination with Mediteanox®, after 8 weeks daily intake, middle aged participants showed significantly improved results of crucial early atherosclerosis warnings (Nutrients 2019, 11(3), 640). Besides hypertension, hyperglycemia is another ageing concern; clinical and preclinical studies showed our fig fruit extract ABAlife® to lower post-prandial blood glucose and insulin responses (Nutrients 2019, 11(8), 1757; Scientific Reports 2020; 10:10463). Microbiome health is crucial in ageing: Cynamed™ artichoke extract prebiotic activity was recently verified (Nutrients 2020, 12, 1552) through a simulator model of the human microbial ecosystem (SHIME®).

3 What support do you offer customers looking develop specific formulations and product applications?

Euromed expertise in product development allows for tailoring products and solutions. We're expanding the products obtained through a proprietary, eco-friendly, osmotized water-only extraction (Pure-Hydro Process™) and introduced Earth Harmony Organic Extracts™, for increased demand for ingredients greener and free from any organic solvent-related safety concerns. For formulations requiring superior flow characteristics, several extracts are also available with our granulation process Ultra Flow®.

4 How do you define your company's point of differentiation and advantages in the market?

Our corporation was established 50 years ago to service the European pharmaceutical industry and stringent quality standards were established. This unique expertise and premium quality are now also available to the nutraceutical market. Each production batch is subjected to a minimum of twenty laboratory tests as part of Euromed PhytoProof® process of quality control and seal.

About Vitafoods Insights

Vitafoods Insights is a community-powered knowledge platform designed to help the industry connect, develop and progress. Bringing together the best nutraceutical minds, we focus on the trends and market developments that matter. Championing knowledge with purpose, we publish content that drives better business solutions for industry professionals.

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