

Interview with Barrie Tan, PhD, Co-Founder and President, American River Nutrition

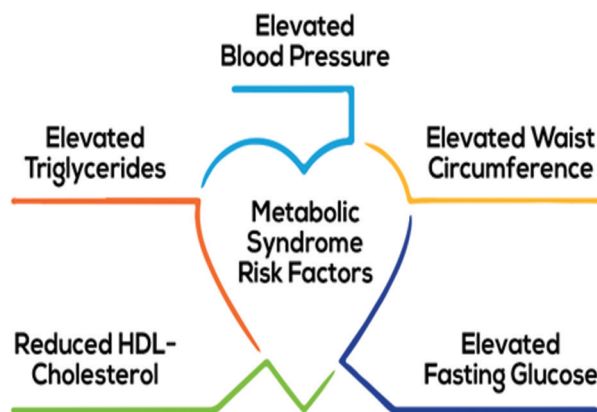
Interview by Sheldon Baker

Dr. Barrie Tan is a scientist with a PhD. in Chemistry/Biochemistry and was formerly an assistant professor at the University of Massachusetts in Amherst (chemistry, food science and nutrition). Today, Dr. Tan is the president of American River Nutrition (ARN), a natural health R&D company he started with his wife, Elizabeth, in 1998. Dr. Tan's mission is simple – help improve the everyday health of people's lives through the rigorous research of ARN's branded ingredients, namely, the best-in-class tocopherol-free tocotrienol and the most potent form of vitamin E in existence today, a first-in-class healthy aging compound, geranylgeraniol, a building block for the synthesis of key nutrients, and the next generation ubiquinol that supports heart function and cellular energy through CoQ10's well-understood mechanisms.

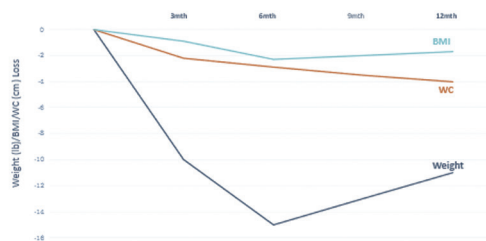
Sheldon Baker is an InnoVision contributing editor. His freelance editorial content can also be found in several lifestyle publications, and as CEO of Baker Dillon Group LLC, he has created numerous brand marketing communications and public relations campaigns for health and wellness organizations. Contact him at Sheldon@NutraInk.com.

Integrative Medicine: A Clinician's Journal (IMCJ): American River Nutrition celebrated its 25th anniversary in 2023. From my research I found the company's motivation has been focused on the scientific advancement of supplements. Do you think you've succeeded?

Barrie Tan, PhD: I would say emphatically that we have made significant contributions to broadly address chronic health conditions. We have three outstanding products, DeltaGold® Annatto Tocotrienol which is our champion, GG-Gold® an anachronism for geranylgeraniol (GG), an endogenous nutrient found in our body. Recently, we produced ProQnol™, a next generation ubiquinol which I will focus on in this interview. I like to show this diagram when I say chronic conditions as there are many descriptions. When our metabolism is out-of-kilter, known as metabolic syndrome (MetS), we develop problems like CVD, hypertension, dyslipidemia, T2DM and fatty liver disease, to name some common ones. These chronic conditions are marked by 5 known factors like elevated sugar and fat in our blood.



In particular, we study the role of tocotrienol in MetS relentlessly! In doing so, we evaluate the impact of annatto tocotrienol in chronic conditions in human trials. In a 12-month study we focused on the chronic condition of fatty liver disease. We conducted three studies over a five-year period where we gave people 300mg 2x/d with a meal. There was separate 3-, 6-, and 12-month trials. Here are the results. One, the consumer understands that it works for them, because we found their BMI level dropped and they lost 10-15 pounds in the 3-, 6-, and 12-month periods. This weight loss is sustainable. We also found their CRP and liver enzymes which is caused by stress dropped.



Pervez MA, Khan DA, et al. Effects of Delta-tocotrienol Supplementation on Liver Enzymes, Inflammation, Oxidative stress and Hepatic Steatosis in Patients with Nonalcoholic Fatty Liver Disease.

Pervez MA, Khan DA, et al. Delta-tocotrienol Supplementation Improves Biochemical Markers of Hepatocellular Injury and Steatosis in Patients with Nonalcoholic Fatty Liver Disease.

Pervez, Muhammad Amjad, et al. Delta-Tocotrienol Supplementation Improves Biochemical Markers of Hepatocellular Injury and Steatosis in Patients with Nonalcoholic Fatty Liver Disease: A Randomized, Placebo-Controlled Trial.

I also want health professionals to be aware of these fatty liver improvements. We studied steatosis, which means fatty liver. We studied fibrosis, which means scarring of fatty tissue. We saw that the scarring tissue is reduced in studies. We went directly after the fatty liver condition because it affects about 90 million in the US alone. Who would have guessed 40 years ago after the understanding of liver cirrhosis by high alcohol consumption, we would have the same problem by high fat and sugar consumptions. The disease is named non-alcoholic fatty liver disease (NAFLD). At the end of the day, we will never have enough good livers for liver transplants. Our only hope is to find healthy protocols to protect our precious liver that performs >700 functions.

IMCJ: Continuing the thought of my earlier question, how has your company continued to be at the forefront of supplement innovation and development?

Dr. Tan: Our DeltaGold® Tocotrienol is tocopherol-free. Nobody has this tocopherol-free ingredient. I refer to this tocotrienol as *best-in-class*. Why tocopherol-free? We know tocopherol interferes with the function of tocotrienol. If we want to innovate, then this is the route we need to take. We and others proved the veracity tocopherol antagonism. That's one example of research innovation.

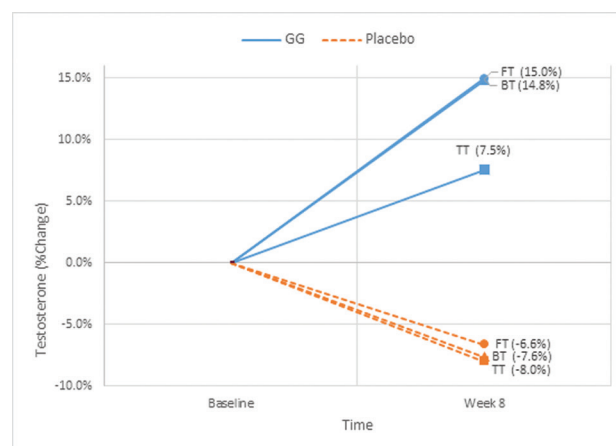
The second innovation is GG-Gold®, our *first-in-class* geranylgeraniol (GG), a little-known endogenous compound. It is almost a forgotten compound. GG is made in the body and is an essential body building block supporting numerous health functions. This is a newly launched ingredient and American River Nutrition is the only company manufacturing in the United States.

The third innovation, ProQnol™, our *next-in-class* CoQ10 ubiquinol, we developed during the Covid-19 lockdown. I was not able to travel, honor speaking engagements or meet new people. I was contained in my office and lab and what came to my attention was the possibility of transforming CoQ10 ubiquinone into the activated CoQ10 ubiquinol. Work in the laboratory with fellow scientists, over the next 12-18 months found us pairing ubiquinol with our GG-Gold® ingredient to make a new formulation, ProQnol™. This unique CoQ10-GG formula was launched in 2022.

IMCJ: Talk a little more about GG-Gold® known as geranylgeraniol.

Dr. Tan: GG is used in our body to make two major endogenous nutrients, menaquinone-4 (MK4) and ubiquinone-10 (CoQ10). The question to ask is why does our body make GG, and why is it not talked about. GG-to-CoQ10 and GG-to-MK4 are biochemical realities. GG helps synthesize skeletal muscle protein and increases muscle function and strength. GG regenerates atrophied muscle, for example in recovery and/or in the elderly. It's

the old saying, if you don't use it, you lose it. GG helps to reduce such loss. Further, GG increases mitochondrial respiration. American River Nutrition conducted a study in 2022 focusing on atrophied muscle. There have also been studies in Australia and Japan on muscle regeneration and mitochondrial respiration. So, GG is all about the biosynthesis of MK4 and CoQ10, separately, testosterone and muscle. We recently completed a trial on healthy subjects and found out that GG is safe at the 300mg/d dose for men and women. This is the first GG trial of its kind. In a subset of men with low testosterone (<700ng/L), GG increased total testosterone levels by 7.5%. Importantly, the available testosterone (free and bioavailable) were increased by 15%.



Abbreviations: FT, Free testosterone; BT, Bioavailable testosterone; TT, Total testosterone

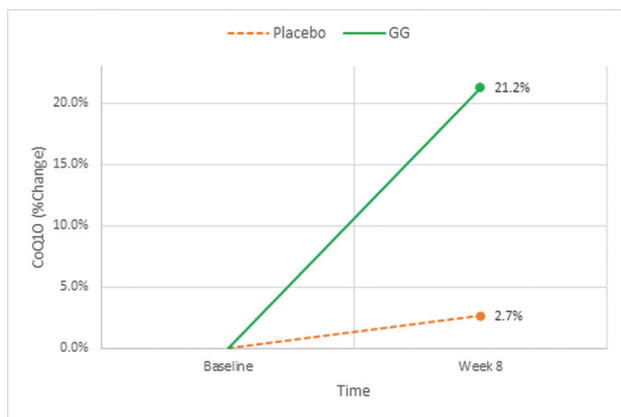
Why is GG not talked about if it's so important? This ingredient is simply unavailable in the marketplace. It was used in tiny amounts for scientific research only. So now is the time for GG to shine in nutrition. <https://www.mdpi.com/1661-3821/3/4/43>

IMCJ: Please clarify that the combination of ProQnol™ and GG-Gold® is what you call the next generation ubiquinol?

Dr. Tan: Ubiquinol is crystalline, not easily soluble and difficult to absorb. Firstly, GG dissolves ubiquinol partially. Secondly, we emulsify ubiquinol in a plant extract to enhance absorption. Lastly, we pair ubiquinol with GG as this companion makes biochemical and nutritional sense. This is a biohacker's paradise. These innovations have been awarded multi-patent protection by the United States Patent and Trademark Office.

IMCJ: You also recommend that ingredient combination for use with statins. Why is that?

Dr. Tan: This is an important question. Statins simultaneously destroy both CoQ10 and GG, both precious within our body. We recently conducted a trial and gave people 300mg/d of GG for 2 months. We saw that GG enabled the body to synthesize CoQ10 by about 20%. Never before has a compound been known to increase blood CoQ10 except with CoQ10! I call CoQ10 + GG a “statin companion” product. Some may say, if I supplement with CoQ10 I can get a 100% or even 200% increase in CoQ10 blood levels. So, a 20% increase is nothing to write home about. However, this is not insignificant. When you supplement with CoQ10, it may increase to 200% in the blood. When you supplement with GG, it is distributed throughout the body. GG goes into the blood stream and into every organ, and then to our cells and finally inside of cells. There inside the cells, GG is used to make CoQ10. The newly synthesized CoQ10 travels out of every cell and organ and back into the blood circulation to appear as 20% above baseline! This is true bioavailability of the endogenously synthesized CoQ10. So CoQ10 increasing by 20% via supplemental GG has a vastly different meaning to CoQ10 increasing by 200% via supplemental CoQ10.



IMCJ: Are you able to mention a few products that include ProQinol™ in their formulation?

Dr. Tan: For the health professional market Designs for Health has a CoQ10 product which is 100mg ubiquinol with 60mg GG. Another of their products doubled the dose to 200mg with 120mg GG. For consumers, Wellness Extract’s Bio-Qunol, and XtendLife’s Xtend-Quinol, both have 100mg ubiquinol and 50mg GG. More options will be available in the future.

IMCJ: Are there other studies that you currently are undertaking?

Dr. Tan: We do have a few studies in the works. We have one study we hope will show an increase in MK4 in the blood. We are not quite there yet. We also have a double-blind placebo-controlled US study where people are on

statins and under a cardiologist’s care and who have dyslipidemia. They have myopathy or muscle problems. They are walking slowly on a treadmill challenged by the statin-induced myopathy. The muscle problem is known as Statin-Associated Muscle Symptoms (SAMS). We have two groups on GG, one on 150mg/d and the other on 300mg/d. This is a clear simple study. We supplement people with only GG to determine if it mitigates the myopathy problem caused by statin drugs.

I love to show a diagram in what I call the interstate function of Cholesterol and GG in all the 40 trillion cells (5000x the population of the world) in each human body. I illustrate this with I-95, the most trafficked highway in our country.



This is the highway where statins are used to reduce cholesterol, however statin is an indiscriminate cholesterol reducer. Right below cholesterol reduction is GG, that is responsible for CoQ10, MK4 and skeletal muscle protein (SMP) synthesis, even testosterone and brown adipose tissue (BAT). All these necessary nutrients, derived from GG, are simultaneously reduced by statins. GG has a small molecular weight of 290 and CoQ10 has a large molecular weight of 870. So, CoQ10 is considered the largest of the small molecules and is very difficult to absorb in our body. GG absorbs well because it is three times smaller than CoQ10. It absorbs much faster, allowing the human body to convert it to CoQ10 inside cells. Nobody has done this. We’re giving GG to the human body, and the human body makes CoQ10. I’m really excited about this research. It is as good as it gets.

IMCJ: You have stated that statins will supersede products like Tylenol® as the most used drug. Why is this perspective important?

Dr. Tan: About 52 million people use acetaminophen or paracetamol, commonly known as Tylenol®. Currently about 40 million Americans take statins. Statins have already been repurposed as a drug for T2DM. If new indications, such as for Covid-19, continue to advance statins as repurposed drugs, this could potentially reach 80 million statin takers by 2030. Therefore, 20 million Americans may experience SAMS as one-in-four statin takers are expected to have muscle problems. If and when this happens, GG may meet the unmet need of addressing the SAMS problem. I very recently published a paper on this medical hypothesis. <https://www.frontiersin.org/articles/10.3389/fphys.2023.1246589/full>

IMCJ: You continue to devote a lot of time to further development of these ingredients.

Dr. Tan: I still have a lot of clinical trials to do. Hopefully, these studies will provide more answers. As we get older, it's necessary to retain muscle mass. Sarcopenia is definitely an aging process. It affects our mobility. If we can resist the muscle mass loss by combining ubiquinol and GG, this research is worthwhile. It is a powerful combination to

encourage our body to use and make CoQ10 internally. This biochemistry is beautiful.

IMCJ: There are several aspects of wellbeing that American River Nutrition focuses on.

Dr. Tan: Adequate exercise and sleep are a must. Less fat and sugar are great. More omega-3 and complex carbs is good. Loving ourselves and others is being human.

IMCJ: If you could wave a magic wand, would you make any changes to the supplement industry?

Dr. Tan: I can think of several simple things. First, get the next generation of ubiquinol into the hands of everyone. Second, understand and appreciate the need for GG to make CoQ10, MK4 and muscle. Third, ubiquinol and GG make an obvious pair. We have done some heavy lifting in science and proofs in trials that these ingredients work. Of course, there is a market challenge in education. The magic wand is that the supplement industry will use these ingredients for the benefit of consumers.

I am working hard to fulfill my commitment to improve the everyday health of people. The focus of American River Nutrition is applying science, developing technology and manufacturing quality health ingredients.



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