

## BioFoundation-G™

By Joseph Pizzorno, ND

### BROAD NUTRITIONAL FOUNDATION WITH ADVANCED GLUTATHIONE SUPPORT

I created BioFoundation-G with several important goals in mind; to provide an optimal nutritional foundation of highly bioavailable nutrients at clinically relevant doses, to improve the detoxification of environmental pollutants by supporting glutathione synthesis, to enhance cellular energy metabolism and protect mitochondrial function, and to include key antioxidants and other biological modifiers which protect against today's chronic diseases. The nutrient and botanicals I chose were guided by the latest research.

A large body of research points to shared underlying physiological dysfunctions underlying most modern diseases. For example, mitochondrial dysfunction is known to play a role in diabetes, cardiovascular disease, and many neurodegenerative diseases.<sup>1,2</sup> Persistent environmental pollutants are both ubiquitous and toxic to many cellular functions, and are now well established contributors to diabetes and insulin resistance, as well as obesity and hypertension.<sup>3,4,5</sup> Recognition of these underlying causes of disease, combined with a better understanding of cellular physiology and intracellular signaling, suggests that many of us need more robust nutritional support, and that we need to expand the nutrients considered "basic" in a multivitamin. BioFoundation-G contains the broad spectrum of nutrients in one bottle that many physicians are currently recommending multiple supplements to achieve.

### WHY IS GLUTATHIONE SO IMPORTANT?

Glutathione is the most abundant intracellular antioxidant and plays a crucial role in shielding cellular macromolecules from endogenous and exogenous reactive oxygen/nitrogen species. Of at least equal importance, conjugation with glutathione is also one of the leading detoxification pathways for many environmental toxins, which can cause direct cellular damage when glutathione regeneration is overwhelmed.<sup>6</sup> For example, organochlorine pesticides and PCBs are both known to deplete glutathione levels and increase oxidative damage, an effect countered by supplementation with N-acetylcysteine.<sup>7,8</sup> Very recent research points to these and other persistent organic pollutants (POPs) as major drivers of

diabetes and cardiovascular disease, with one large study documenting a 38-fold risk for those with the highest levels.<sup>3</sup> Additionally, serum GGT (which metabolizes reduced glutathione, allowing for intracellular synthesis) has emerged as a potential biomarker for exposure not only to POPs, but also to other toxins such as lead, cadmium and other exogenous causes of oxidative stress.<sup>9,10</sup> Thus, supporting glutathione synthesis helps to conjugate harmful toxins, as well as protect cells from their damage, which seems to be underlying many chronic diseases. BioFoundation-G contains 150 mg N-acetylcysteine and 250 mg alpha-lipoic acid per serving, both of which have been shown to increase glutathione levels, and to protect cells from numerous types of metal and organic toxins.<sup>11,12,13</sup>

### BIOACTIVE VITAMINS AT CLINICAL DOSES

BioFoundation-G also contains clinically relevant levels of vitamins not found in other multivitamins. For example, each serving provides 2000 IU of vitamin D3, 45 mcg vitamin K2 and 200 mg niacinamide. Given widespread vitamin D deficiency, a multivitamin with a higher dose helps to improve the multi-system consequences of sub-optimal levels. Vitamin K has also emerged as an important factor not just to bone health, but to cardiovascular health as well. The form of vitamin K2 used in BioFoundation-G is menaquinone-7, known to have a longer half-life than other forms and result in more stable serum levels and critical to support deposition of calcium into bone rather than arteries.<sup>14</sup>

### CELLULAR ENERGY/MITOCHONDRIAL SUPPORT

Mitochondrial damage or inefficiency seems to underlie so many of today's pathologies, typically due to poor diet and exogenous toxins, leading many clinicians to recommend supplemental nutrients such as CoQ10. BioFoundation-G contains 50 mg CoQ10 per serving, as well as 250 mg lipoic acid, both nutrients shown to enhance and protect mitochondrial function, providing many cardiovascular and metabolic benefits.<sup>15,16</sup>

## ANTIOXIDANT SUPPORT & HEPATOPROTECTION

BioFoundation-G provides diverse antioxidant support, as well as protection from hepatotoxins. For example, each serving contains 150 mg milk thistle, shown to provide protection from many environmental toxins, as well as 40 mg bilberry extract, 50 mg bioflavonoids, along with hesperidin, lycopene and lutein.<sup>17</sup> Rather than high levels of single antioxidants which causes imbalances, this formulation is designed to achieve superior results by ensuring adequate levels of synergistic nutrients.

## BIOLOGICAL MODIFIERS

Finally, several plant-based nutrients have emerged as important regulators of cellular signaling pathways, and modify multiple biological processes thought to be involved in longevity-related functions. For example, resveratrol has remarkably similar effects to caloric restriction in terms of life span extension, and has been shown to improve insulin sensitivity, mitochondrial function and reduce inflammation.<sup>18,19,20</sup> BioFoundation-G contains 50 mg resveratrol per serving, as well as 50 mg green tea extract.

## QUALITY

Bioclinic Naturals has the highest and most rigorous standards for quality, potency, purity and integrity of its products. To ensure that you can be totally confident prescribing BioFoundation-G to your patients, 400 individual quality control tests were performed on the raw materials and final product.

## CONCLUSION

In summary, BioFoundation-G contains clinically relevant doses of highly bioactive and bioavailable nutrients, which in addition to providing an optimal nutritional foundation, supplies nutrients which improve various cellular processes, including mitochondrial function. It also contains biological modifiers known to have diverse benefits, such as resveratrol, and rate-limiting nutrients for glutathione synthesis to counter the effects of our toxic environment. Smart, Effective, Potent, Pure.

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