

PR301

GENETICS DETERMINES WHICH SUPPLEMENTS ARE SAFE (EX: FOLATE + B₁₂ BUT NOT FOLATE ALONE) & WHICH ARE UNSAFE (EX: ANTI-OXIDANTS; MINERALS). V Herbert, Mt Sinai -Bronx VA Med Ctrs, NY, NY, USA.

Neural tube defects (NTDs) in many fetuses are often due to a folate-related genetic predisposition, prevented by folate starting before pregnant. Black females lack this predisposition, but have one for early pernicious anemia (PA) while fertile, rather than, like non-Blacks, in elder years. Folate conceals this PA, allowing progression of B₁₂ deficiency neural damage to irreversibility; this is prevented by putting B₁₂ in the oral folate supplement or fortificant. This also prevents the otherwise inevitable genetically predisposed gradual development of PA with increasing age in all ethnic groups (Herbert, Commentary, *AJCN*, 1997;65:572-3). Antioxidant supplements are synthetic factory-processed, shelf-stable forms, therefore biochemically unbalanced by definition, and uniformly unsafe (Herbert, *JADA* 1997, in press; *AJCN* 1997; 65 [April]). Missing are not only the less shelf-stable important forms naturally present in plant foods, but also the plethora of other plant (phyto-) chemicals (buzzword: "nutraceuticals") which together provide biochemical balance. The supplement form of vitamin C drives harmful free radical generation from iron; 100 mg supplemental C daily kills human macrophages prematurely; 200 mg daily is even more harmful; iron helps the ~6% iron-deficient North Americans and harms the ~12% with a gene for iron overload and is lethal to the ~0.5% with 2 iron overload genes (Herbert et al., *J Nutr* 1996;126[Suppl 4]:1213S-20S; also pp 1746; 1902. Only the *trans*- form of β -carotene is in supplements; it promotes much more cancer and heart disease than a placebo in smokers. Vitamin E supplements (solely α -tocopherol) are prohemorrhagic, inhibiting heart attacks and promoting excessive bleeding, including fatal hemorrhagic strokes. α -tocopherol "enhances immunity," producing either desirable immunity to foreign attack, or harmful autoimmunity, depending on genetic predisposition (Herbert & Kasdan, *AJCN* 1994;60:639-40; Liu et al., *NEJM* 1996;335:1651-9). Excess supplement minerals harm (Barrett & Herbert, *The Vitamin Pushers*, 1994, Prometheus Press, Amherst, NY).