

The importance of Redox Modulations in Disease

Cellular redox shifts towards a more oxidized environment result in lipid peroxidation, protein and DNA oxidation, and mitochondrial dysfunction that are linked to a variety of diseases associated neurodegeneration and aging. The company has developed a new class of synthetic compounds called MFRMs that uniquely reduce oxidative stress that can result in debilitating tissue damage. Their chemical structures are shown below. MFRMs not only scavenge free radicals but also independently sequester and redistribute transition metals such as iron, copper and zinc that participate in the generation of toxic hydroxyl radicals. Initially called multifunctional antioxidants (MFAOs), their name was subsequently changed to multifunctional redox modulators (MFRMs) because subsequent studies revealed that MFRMs demonstrate distinct multiple properties that directly and indirectly modulate the cellular redox environment. MFRMs not only scavenge free radicals but also independently sequester and redistribute transition metals such as iron, copper and zinc that participate in the generation of toxic hydroxyl radicals. MFRMs can also neutralize neurotoxic zinc complexes of amyloid beta plaque and protect mitochondrial function against manganese poisoning. These compounds are orally active and attain therapeutic levels in the sensory cell tissues of the eye, ears, and central nervous system (CNS).

