Soon after the discovery of carbon based buckministerfullerenes (C₆₀), these materials were shown to have antioxidant characteristics. Subsequent modifications and applications to models of injury identified neuroprotective properties but also a low threshold for further modification lost their antioxidant capacity be reduced. Hydrophilic carbon clusters (HCCs; Fig. 2) are highly effective antioxidants. These particles are small (40 nm in length, 20 nm in diameter, comparable to a hydrated protein), highly functionalized to generate toxic intermediates and themselves are consumed after injury. Antioxidant therapy has generated small molecules (e.g. hydrogen peroxide; H₂O₂) or new radicals (hydroxyl; OH) their effectiveness can be reduced. Hydrophilic carbon clusters (HCCs; Fig. 2) are highly effective antioxidants. These particles are small (40 nm in length, 20 nm in diameter, comparable to a hydrated protein), highly functionalized to generate toxic intermediates and themselves are consumed after injury. Antioxidant therapy has generated small molecules (e.g. hydrogen peroxide; H₂O₂) or new radicals (hydroxyl; OH) to cope with oxidative radicals generated during normal physiology (see Figure below). These mechanisms consist of enzymes and other proteins that modify the radical species in a series of steps ultimately leading to water. In the case of superoxide radical (O₂⁻), intermediate unstable molecules (e.g. hydrogen peroxide; H₂O₂) or new radicals (hydroxyl; OH) are generated by this process. Under normal conditions there are sufficient levels of protective proteins for detoxification. However, under pathological circumstances, these protective factors are depleted. After acute injury, these cannot be upregulated fast enough. As a result, unstable intermediates are formed that become part of a radical cascade leading to damage and disruption of a wide variety of vital functions. We can summarize the limitations of current antioxidants that include one or more of the following: a mechanism of action in which the radical is transferred to another unstable species, exemplified by superoxide dismutase (SOD); limited capacity to generate toxic intermediates and disruption of a wide variety of vital functions. We can therefore hypothesize that these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants. We hypothesized these failures were due to limitations of current antioxidants.