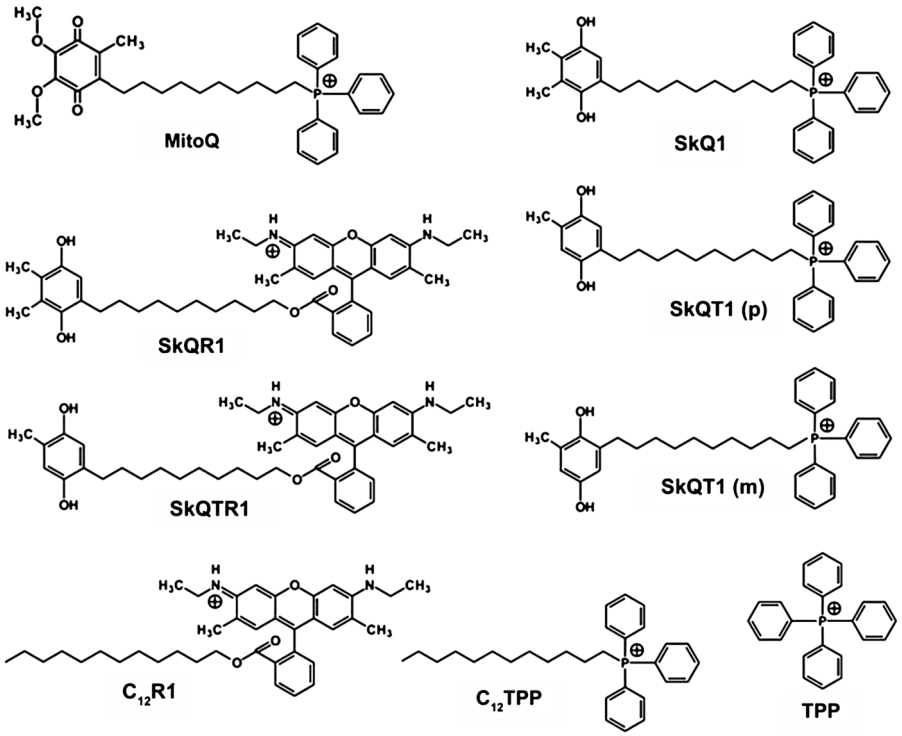

Figure 9.1 Some of the cationic mitochondria-targeted antioxidants and their analogs lacking a quinol residue.

9.4.1 Mitochondria-Targeted Antioxidants in Invertebrate Models

Identifying compounds that slow mammalian aging is clearly more relevant for human drug development compared to invertebrate animal models studies. However, the prohibitive cost of aging studies on mammals, as well as the substantial amount of time necessary for such studies, make invertebrate model organisms an attractive choice for anti-aging drug candidates screening (see ref. 96 for an extensive review of the progress being made in identifying compounds that extend the lifespan of invertebrates). The next step is to elucidate the genetic pathways that are targeted by the compounds found. Finally, it is possible to check the role of these pathways in mammalian aging.

The two most popular invertebrate models for such screenings are the nematode *C. elegans* and the fruit fly *D. melanogaster*. MitoQ was shown to extend lifespan and to protect cardiolipin from oxidation in *C. elegans* overexpressing human amyloid β (Alzheimer's disease model). It is worth noting that MitoQ failed to protect the mitochondrial DNA from oxidative damage, indicating that the protective effects are limited by the mitochondrial membrane.[97]