ABSTRACT

Parkin protein variants having activating mutations and/or fused to a mitochondrial targeting sequence are provided. The engineered Parkin may be a fusion protein including a mitochondrial targeting sequence (MTS); a transmembrane domain; and a Parkin protein or functional variant or fragment thereof, such as a Parkin having an N-terminal deletion. The MTS may be the MTS of PINK1 or a functional variant thereof, optionally with a substitution at Phe-104. Alternatively or in addition to the fusion, the engineered Parkin may have one or more activating mutations, such as single amino-acid substitutions. The engineered Parkin may be delivered in a vector, such as an adeno-associated virus (AAV) vector, and may be used to treat a disease or disorder, such as Parkinson's disease or any of various neurodegenerative diseases.

[Figure 16]