The recent success of gene therapy across multiple clinical trials has inspired a great deal of hope regarding the treatment of previously intractable genetic diseases.However, this hope must be tempered by the reality of the mitochondrial organelle, which possesses specific biological properties that complicate genetic manipulation.We will also present some ways in which these challenges can be overcome by genetic manipulation strategies tailored specifically for mitochondrial diseases.This optimism has been extended to the prospect of gene therapy for mitochondrial disorders, which are not only particularly severe but also difficult to treat.In this perspective, we will discuss some of these .complicating factors, including the unique pathways used to express and import mitochondrial proteins