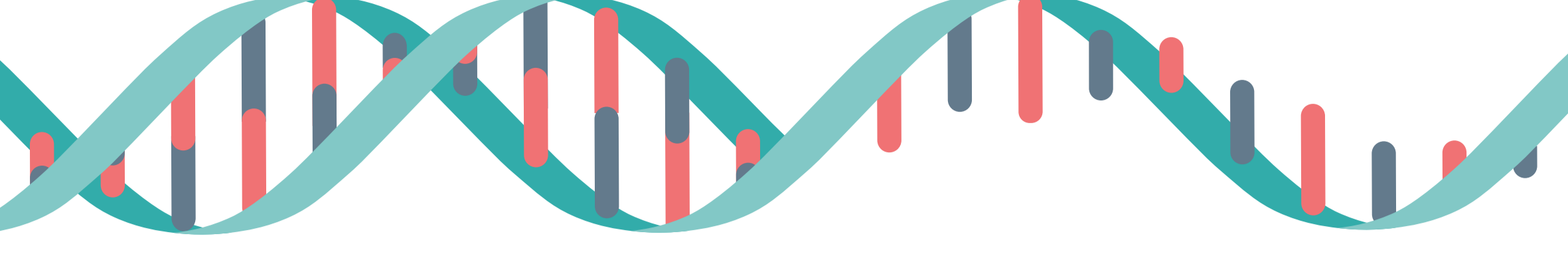


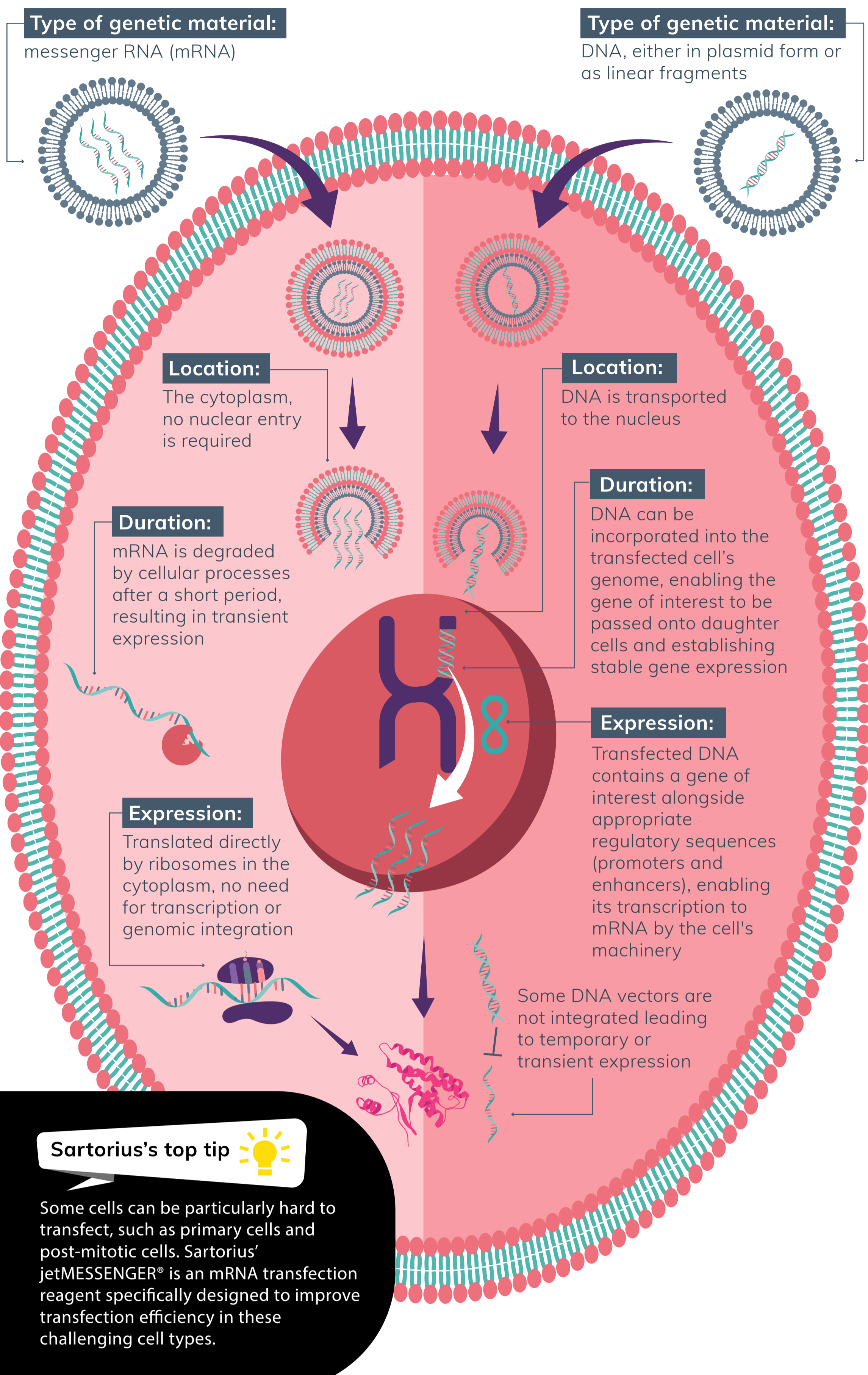
DNA vs mRNA transfection



DNA and mRNA transfection are both used to introduce genetic material into cells, but they differ in the genetic material used and cellular processes initiated. This infographic reviews the working principle of each, highlighting their pros and cons, while providing top tips for your transfection studies.

mRNA transfection


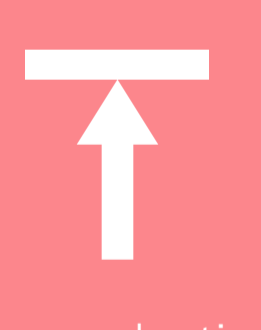




DNA transfection



Nucleic acids: compared



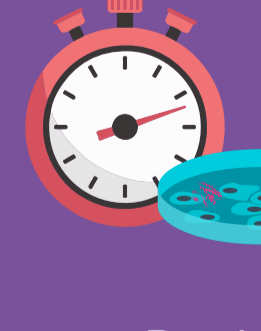
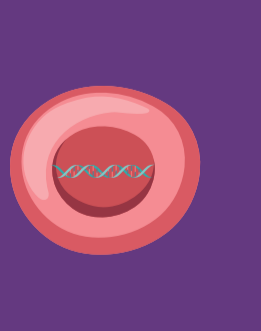
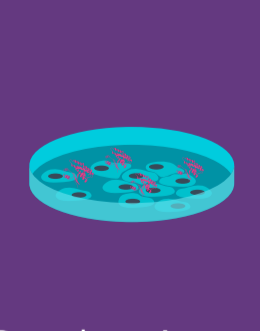
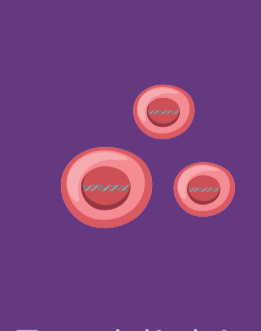


RNA	VS	DNA
Advantages		
 Transient transfection of machinery for gene editing limits duration of editing capabilities, minimizing the chance of off-target effects	 Simpler path to expression dramatically increases transfection efficiency, particularly in hard-to-transfect cells like primary cells	 Inexpensive to produce
 Increased safety in clinical settings as no genomic integration	 Enables stable expression, increasing cost-effectiveness	 Established: researchers are well-versed in using DNA, and cloning tools are commonplace
 Stable and easy to handle		

Disadvantages		
 Longer, more expensive process to produce	 Protein production per cell is limited to number of mRNAs successfully transfected, leading to a smaller yield than DNA	 Less efficient as it must enter the nucleus to be expressed
 Less established: reagents and cloning tools are less commonplace	 Comparatively less stable than DNA, making it harder to handle	 Genomic integration can pose problems for some applications, particularly clinical

Sartorius's top tip 

Transfecting both DNA and siRNA in your lab? Select a transfection reagent that has been optimized for both nucleic acids, such as jetPRIME®.

Applications					
 Gene editing technologies where temporary expression is desired	 Vaccine development	 Rapid protein expression	 Long-term studies of gene function	 Production of recombinant proteins	 Establishing genetically modified cell lines

Sartorius's top tip 

Conducting DNA transfection for a number of different applications, from stable or transient expression to the delivery of CRISPR gene editing machinery? Select a transfection reagent compatible with each of these applications, which has been designed to maximize cellular uptake and endosomal escape for higher transfection efficiency, such as jetOPTIMUS® from Sartorius.