Gene Therapy Quiz Answer Key PDF

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Which regulatory body oversees gene therapy in the United States?

A. WHO
B. EMA
C. FDA ✓
D. CDC

What are some challenges faced by gene therapy? (Select all that apply)

A. Immune response ✓
B. Delivery issues ✓
C. High success rate
D. Ethical concerns ✓

What is the term for a gene that is transferred from one organism to another?

A. Transgene ✓
B. Genome
C. Chromosome
D. Alleles

Which of the following are ethical considerations in gene therapy? (Select all that apply)

A. Cost of treatment
B. Long-term effects ✓
C. Accessibility to all patients ✓
D. Germline modifications ✓

What are the main challenges in delivering genes to target cells in gene therapy?

The main challenges in delivering genes to target cells in gene therapy are efficient delivery mechanisms, immune system evasion, and precise targeting to avoid off-target effects.

Discuss the ethical implications of using CRISPR technology in gene therapy.

The use of CRISPR technology in gene therapy raises ethical issues such as the risk of off-target effects, the potential for creating genetic inequalities, and the debate over the appropriateness of germline editing.

How does the use of viral vectors in gene therapy work, and what are the associated risks?

Viral vectors work by infectiously delivering genetic material into target cells, allowing for the expression of therapeutic genes. However, associated risks include immune responses that can lead to inflammation, the possibility of inserting the therapeutic gene into unintended locations in the genome (insertional mutagenesis), and the chance of the viral vector replicating uncontrollably.

Which diseases have been successfully treated using gene therapy? (Select all that apply)

A. Certain types of blindness ✓

B. Severe Combined Immunodeficiency (SCID) ✓

C. Influenza

D. HIV (in investigational treatments) ✓

Which of the following is a genetic disorder that gene therapy aims to treat?

A. Diabetes

B. Cystic Fibrosis ✓

C. Hypertension

D. Asthma

What year was the first successful gene therapy performed?

A. 1980

B. 1990 ✓

C. 2000

D. 2010

What is the primary goal of gene therapy?

A. To enhance athletic performance
B. To alter genetic material to treat or prevent disease ✓
C. To create genetically modified organisms for agriculture
D. To clone animals

What is a major ethical concern associated with germline gene therapy?

A. Cost of treatment
B. Long-term environmental impact
C. Changes can be inherited by future generations ✓
D. Difficulty in administering treatment

Which type of gene therapy targets non-reproductive cells?

A. Germline Gene Therapy
B. Somatic Gene Therapy ✓
C. Viral Gene Therapy
D. CRISPR Gene Therapy

Which vector is commonly used in gene therapy for delivering genes?

A. Bacteria
B. Fungi
C. Viral Vectors ✓
D. Plant Cells

What are potential side effects of gene therapy? (Select all that apply)

A. Immune reactions ✓
B. Insertional mutagenesis ✓
C. Weight gain
D. Off-target effects in gene editing ✓

Which of the following are methods of gene delivery in gene therapy? (Select all that apply)

A. Viral Vectors ✓

B. Liposomes ✓

C. Direct injection of naked DNA ✓

D. Antibiotics

Describe a case study where gene therapy was successfully used to treat a genetic disorder.

In 2019, Zolgensma was approved for treating spinal muscular atrophy (SMA), a genetic disorder caused by a deficiency of the SMN1 gene. This gene therapy has shown remarkable success in improving motor function and prolongation of life in affected infants.

Explain the difference between somatic and germline gene therapy.

The main difference between somatic and germline gene therapy is that somatic gene therapy alters genes in non-reproductive cells, affecting only the individual, whereas germline gene therapy modifies genes in reproductive cells, allowing changes to be passed on to offspring.

Gene therapy can be used to treat which of the following conditions? (Select all that apply)

A. Hemophilia ✓

B. Muscular Dystrophy ✓

C. Common Cold

D. Certain types of blindness ✓

In your opinion, what is the future potential of gene therapy in medicine, and what advancements are needed to realize this potential?

The future potential of gene therapy in medicine is significant, particularly for treating genetic disorders and cancers. To realize this potential, advancements are needed in targeted delivery systems, improved safety profiles, and streamlined regulatory processes.