UNIVERSITÀ DEGLI STUDI DI MILANO

CONCORSO PUBBLICO, PER ESAMI, PER IL RECLUTAMENTO DI N. 1 UNITÀ DI PERSONALE AFFERENTE ALL'AREA DEI FUNZIONARI - SETTORE SCIENTIFICO-TECNOLOGICO, CON RAPPORTO DI LAVORO SUBORDINATO A TEMPO INDETERMINATO PRESSO L'UNIVERSITÀ DEGLI STUDI DI MILANO - DIPARTIMENTO DI BIOTECNOLOGIE MEDICHE E MEDICINA TRASLAZIONALE - CODICE 22496

La Commissione giudicatrice del concorso, nominata con Determina Direttoriale n. 16578 dell'11/10/2024 e composta da:

Prof.ssa Nicoletta Landsberger	Presidente
Prof.ssa Elena Battaglioli	Componente
Dott.ssa Nicoletta Loberto	Componente
Dott.ssa Marcella Montagna	Segretaria

comunica i quesiti relativi alla prova orale:

GRUPPO DI QUESITI N. 1

1. La candidata/il candidato esponga brevemente come si possono produrre cellule iPSC umane.
2. La candidata/il candidato esponga come riterrebbe opportuno organizzare una "facility" di colture cellulari dipartimentali in cui devono essere previste attività di routine come la coltivazione di cellule in linea, ma anche coltivazioni di cellule primarie di pazienti e di IPS umane.

Brano in inglese: In recent years, the emergence of highly versatile genome-editing technologies has provided investigators with the ability to rapidly and economically introduce sequence-specific modifications into the genomes of a broad spectrum of cell types and organisms.
The core technologies now most commonly used to facilitate genome editing are clustered regularly interspaced short palindromic repeats (CRISPR)-CRISPR-associated protein 9 (Cas9), transcription activator-like effector nucleases (TALENs), zinc-finger nucleases (ZFNs), and homing endonucleases or meganucleases. In particular, the ease with which CRISPR-Cas9 and TALENs can be configured to recognize new genomic sequences has driven a revolution in genome editing that has accelerated scientific breakthroughs and discoveries in disciplines as diverse as synthetic biology, human gene therapy, disease modeling, drug discovery, neuroscience, and the agricultural sciences.

GRUPPO DI QUESITI N. 2

1. La candidata/il candidato esponga brevemente come si possa produrre una linea cellulare geneticamente modificata tramite la tecnologia Crispr/Cas.
2. La candidata/il candidato esponga come riterrebbe opportuno organizzare uno spazio dipartimentale di colture cellulari al fine di limitare fenomeni di contaminazione, indicando le procedure utili ad evitare e, se necessario, sanare eventi di contaminazioni cellulari.

Brano in inglese: With rapid progress in molecular biology research methods, including genome-sequencing technology, epigenetic analysis, and genome-editing technology, as well as novel stem cell research technologies such as organoid technology, disease research using iPSCs is changing dramatically.
For these reasons, iPSC technology, when combined with other research techniques, enables the analysis of the pathogenesis of various diseases.
Most diseases involve a genetic or environmental predisposition, including age. Genetic and environmental predispositions are not mutually exclusive, and their involvement in the pathogenesis of each disease will naturally vary.
Since most age-dependent or environment-dependent epigenetic changes in original somatic cells could be erased during the iPSC generation process, research using iPSC technologies was initially focused on generating and analyzing pathological models of monogenic familial diseases with obvious genetic mutations.

GRUPPO DI QUESITI N. 3

1. La candidata/il candidato esponga brevemente come si possano ottenere cellule che downregolano in maniera transiente o regolata l'espressione di un gene

2. La candidata/il candidato esponga come riterrebbe opportuno organizzare una "facility" dipartimentale di crioconservazione di cellule e quali indicazioni darebbe agli utilizzatori per la gestione di questa facility.

Brano in inglese: A significant development in scientific methods over time has led to the generation of three-dimensional (3D) organoid culture and 3D printed scaffolds that can recapitulate human biology and diseases more precisely.
In 1946, Smith and Cochrae first used the term 'organoid,' which means 'resembling an organ,' to describe a case of cystic teratoma.
However, now the term 'organoid' has a more restricted definition- i.e., organoids are self-assembled in vitro 3D structures, primarily generated from primary tissues or stem cells such as adult stem cells, induced pluripotent stem cells, and embryonic stem cells. In all situations, the generation of organoids depends on the self-assembly and differentiation of cells and the signaling indications from the extracellular matrix and the conditioned media. Once the 3D structures assemble, they can mimic the complex aspects of their organ counterparts, can be expanded long term, cryopreserved, and genetically modified.

Milano, 7 novembre 2024

La Commissione

Prof.ssa Nicoletta Landsberger Presidente

Prof.ssa Elena Battaglioli Componente

Dott.ssa Nicoletta Loberto Componente

Dott.ssa Marcella Montagna Segretaria