

**QUESITO 1:** QUALI E QUANTE BANCHE PUBBLICHE SONO OGGI OPERATIVE SUL TERRITORIO ITALIANO.

**QUESITO 2:** QUALI MARCATORI SI UTILIZZANO PER LA TIPIZZAZIONE CITOFUORIMENTRICA DELLE CELLULE STAMINALI MESENCHIMALI.

**QUESITO 3:** QUALI SONO LE TECNICHE DI ESPIANTO CELLULARE CHE RITIENE PIU' CONFACENTI ALLA REALIZZAZIONE DI SCAFFOLD NATURALI DA CRIOPRESERVARE.

**INGLESE:** LETTURA E TRADUZIONE DELL'ABSTRACT ALLEGATO AL VERBALE

**INFORMATICA:** Esempi di informatizzazione dei sistemi di crioconservazione e loro utilità. Prova pratica abbinata.

ESIRATTO

**BUSTA 1**

# Stem Cell Biobanks for Research

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## Biobancos de Células Madre para Investigación

**ABSTRACT:** The collection and storage of human tissue samples has been present in medicine for centuries, however, biobanking has recently become a dedicated activity. The technological developments that have allowed the isolation, storage and long term viability of human cells *ex vivo*, and to obtain relevant scientific information, including genetic information, open tremendous possibilities for advancing biomedical research. At the same time, these possibilities have raised complex ethical issues regarding tissue donors, researchers using samples and society awareness of biobanking as a whole.

This article aims to review the operation of stem cell biobanks, related ethical issues and the legal framework in Spain. Special consideration will be given to the new but revolutionary appearance of induced pluripotent stem cells. Most of the topics discussed here will be in the framework of banking adult derived stem cells, which do not entail in themselves any significant ethical dilemma.

**KEYWORDS:** stem cell, biobank, pluripotency, human sample, sample access

**RESUMEN:** La recogida y almacenamiento de muestras de tejido humano ha estado presente en la medicina desde hace siglos, no obstante, la actividad de biobanco sólo recientemente ha aparecido como tal. Los desarrollos tecnológicos que han permitido el aislamiento y almacenamiento viable a largo plazo de células humanas *ex vivo*, y la obtención de información científica relevante, incluyendo información genética, abre enormes posibilidades para el avance de la investigación biomédica. Al mismo tiempo, estas posibilidades han generado dilemas éticos complejos, que conciernen a los donantes, a los investigadores que utilizan las muestras y a la sociedad en su conjunto.

Este artículo pretende revisar las operaciones de los biobancos de células madre, los dilemas éticos relacionados y el marco legal existente en España. Se hará especial consideración al nuevo pero revolucionario campo de las células madre con pluripotencia inducida. Gran parte de los puntos discutidos aquí se aplican a la actividad de biobanco de células madre adultas, que en sí mismas no presentan dilemas éticos.

**PALABRAS-CLAVE:** célula madre, biobanco, pluripotencia, muestra humana, acceso a muestra

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### 1. Introduction

Research in regenerative medicine has gained a strong impulse in the last few years, mainly through the explosion of stem cell research, materializing as a real therapeutic option for next generation medicine. Regenerative medicine is based on the self-renewing and multi- or pluripotency of the diverse kinds of stem cells identified throughout the body and pluripotent stem cells. For a detailed set of guidelines regarding the therapeutic application of stem cells, see the publication by the International Society for Stem Cell Research in 2008 (Hyun *et al.*, 2008). Indeed, several clinical trials are underway now in the

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**QUESITO 1:** COME IPOTIZZA DI ORGANIZZARE UNA BIOBANCA UTILE ALLA MEDICINA RIGENERATIVA IN AMBITO OFTALMOLOGICO.

**QUESITO 2:** QUALI MARCATORI SI UTILIZZANO PER LA TIPIZZAZIONE CITOFLUORIMETRICA DELLE CELLULE VASCOLARI DERIVANTI DAGLI ANNESSI PERINATALI.

**QUESITO 3:** QUALI TECNICHE DI ESPIANTO RITIENE OPPORTUNE PER L'OTTENIMENTO DI COLTURE CELLULARI UTILI IN AMBITO OFTALMOLOGICO.

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*NON ESTRATTO*

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**QUESITO 2:** QUALI TECNICHE SI UTILIZZANO PER PRESERVARE AL MEGLIO LA VITALITA' CELLULARE DI COLTURE CRIO-CONSERVATE.

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