N. 1 BORSE DI STUDIO DAL TITOLO "LA BIOBANCA DEL CRESM PER POTENZIARE LA RICERCA SULLA SCLEROSI MULTIPLA ED ALTRE PATOLOGIE NEUROLOGICHE ED AUTOIMMUNI".

Elenco domande formulate per il colloquio:

Domanda 1)
Descrivere cosa si intende per biobanca di patologia: struttura e organizzazione

Domanda 2)
Descrivere i vari organi di gestione della Biobanca e le figure che si occupano della gestione dell'attività quotidiana della biobanca

Domanda 3)
Descrivere l'importanza e le implicazioni del biobancaggio per la ricerca scientifica

Domanda 4)
Gestione informatica delle informazioni relative a campioni biologici e dati associati in una biobanca

Domanda 5)
Differenza fra collezioni di campioni biologici e biobanche

Domanda 6)
Biobanca di patologia: descrivere i vari step nella gestione del materiale biologico e di dati associati

Domanda 7)
Criteri di qualità, aspetti etici e legali associati al biobancaggio

LETTURA E TRADUZIONE IN INGLESE

1) ARTICOLO CONTRASSEGNATO CON IL N. 1
2) ARTICOLO CONTRASSEGNATO CON IL N. 2
3) ARTICOLO CONTRASSEGNATO CON IL N. 3
4) ARTICOLO CONTRASSEGNATO CON IL N. 4

Organization of a Biobank

Biobanks are heterogeneous in their design and use, as they may contain data and samples obtained as a result of family studies or from patients with a certain disease, as well as control groups. Biobanks may also be generated from large-scale epidemiological research or collections from clinical trials of new medical interventions. Human biological samples include a wide range of tissues, organs, body parts, isolated DNA or RNA, blood, plasma, other biological fluids, cell lines, cell suspensions, etc. Currently, a large number of research projects are focused on the areas of genomics, transcriptomics, proteomics, and metabolomics, and study tissue samples from patients with established clinical and pathological diagnoses or use cell lines/suspensions obtained from the blood of patients. The standardization and centralization of the processing and sampling of biosamples provides a cost reduction as well as increased throughput and accuracy. For example, this can be achieved using automation. The influence of analytical variability will also be limited, thereby improving the prospects of a subsequent study, which would use data from the previously analyzed biosamples. An undetectable systematic error introduced by variable (usually manual) processing of several objects should be avoided. Given that biobank resources are designed for the development of diagnostics, prognostics, prevention, and studying of the etiology of complex diseases in which exposure to specific risk factors is typically low (odds ratio is usually 1.5 or lower), this type of error can cause inaccurate results or mask the presence of a real causal factor. Such an effect may be aggravated in future cohorts where case-control studies are included in the sample, especially if the biomaterial was obtained according to different protocols performed at different clinical bases. If the production of biomaterial and its processing takes place within different premises, then considerable efforts should be directed at training personnel in agreed and approved operational procedures.

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Pre-analythical Sample Handling

In biomedical research, it is becoming increasingly important to expand the analysis from individual molecules to the signatures of nucleic acids, proteins and metabolites in various biological samples of humans. However, the profiles of these molecules can change during collection, storage, and transportation. These factors lead to unreliable results, since the result does not reflect the condition in vitro, but rather an artificial profile shaped during the preliminary preparation of the sample. Therefore, the standardization of the pre-analytical stage in the structure of biobanks is mandatory, since variable factors at the stage can produce a significant impact on the reliability of analytical results.

The pre-analytic stage includes the following three phases:

1. The phase preceding the biological material collection. Here, factors related to the subject (genotype, lifestyle, nutrition, medication, concomitant diseases, surgical interventions, etc.), as well as conditions of samples obtaining (for example, on an empty stomach or postprandial), are of great importance. Most of these variables cannot be standardized because they relate to individual subject and specific treatment methods. However, all of these parameters may affect subsequent analytical results of research and diagnosis.
2. The collection phase of biological material begins when the biobank's staff receive samples. At the moment, the state of the samples is influenced by conditions, transportation (compliance with the cold chain regime, duration) and chain of custody in the laboratory.
3. The phase after collecting includes registering and proper annotation of samples in the biobank database. Different storage conditions and time, control of the archived samples, procedures for isolating of analytes for subsequent research can influence the total outcome of studies.

Collection and Storage of Biomaterial

Blood, urine, and tumor tissues are typical biological samples in biobanks that participants provide in accordance with a certain form of informed consent and are suitable for biomedical research. However, in addition, a wider range of types of biological samples, including hair, nails, saliva, feces, microbiome and breast milk, can also be collected and processed in accordance with the guidelines.

Biobanks are diverse in terms of the purpose for which they collect biological material. Genomic biobanks of entire populations, or population biobanks, are large-scale repositories for biomaterial and related clinical data. A population biobank is designed to link biomarkers with a medical history and lifestyle information. Diseases resulting from mutations of a single gene are rare; hence, this link provides a powerful tool that contribute to our knowledge about both the genetic and environmental determinants that entail to Alzheimers disease, asthma, diabetes mellitus, schizophrenia, cancer, and adverse outcomes such as preterm birth and congenital birth defects.

The European Commission has identified population biobanks as "a collection of biological materials that has the following characteristics: the collection has a population basis; the collection was created or was transformed to provide biological materials or data obtained from them for several future research projects; the collection contains biological materials and related personal data that may include or be associated with genealogical, medical and lifestyle data and which may be regularly updated; biobank receives and delivers materials in an organized manner"

Ethical Aspects of Human Biobanks

Biobanks have given rise to a new field called biobanking. This term covers not only the biobank infrastructure itself, but also sample collection, biosample data, engineering, and technological solutions. The term "biobanking" also refers to the whole range of social, legal, and ethical problems that must be resolved as biobanks develop. For example, any biobank is interested in the fact that a citizen, voluntarily and at the expense of informed consent, transfers his/her material to the biobank, without strictly determining the purpose for which the material is to be used. If a citizen has stipulated conditions—for example, has identified a range of scientific problems in which he/she is not ready to participate through his/her genetic material, then the biobank is faced with the task of tracking the access to the pool of samples and materials, allowing only for specific studies to make use of the samples of particular citizens. This creates organizational, technological, and financial difficulties.

In addition, a citizen may withdraw his/her consent at the stage when the obtained results are to be published or during the processing of his genetic information.

However, how to link the autonomous right of each person to dispose of their genetic material, including the right to determine what types of scientific research are permissible, with the task of gaining mass knowledge is a major problem for biobanks. A problem of this kind cannot be solved via a standard algorithm. Therefore, each biobank, depending on its affiliation, funding format, and collection scale, is constantly forced to address issues related to ethical and legal regulation.