Biobanks

- **Tissue biobanking** refers to the collection of human tissue, blood, cells, and the DNA that served as medium of genetic information, maintaining the connection and correlation of the individual information such as genetic information, health and lifestyle, of which existence makes significant sense of the sample collection of biobanking.

- The residues of human tissue can be stored for decades by paraffin embedding, which is undoubtedly considered as a huge resources for Biobanks.
The Ethical Issues in Biobank Research

- The biobanks provide a good resource for biomedical research, but also cause a series of ethical issues as follows:
  1. How to obtain (what type of consent) the sample information of biobanks?
  2. The relationship between the informed consent, the collection, storage and research of tissues?
  3. The protection of personal rights (information/privacy).
  4. How to maintain the balance between the interests of the individual and the common good of the society?

- It conducts important significance on the understanding of donors’ beliefs and values, and the underlying cause of consent or refusal to provide samples for biobanks.
The Ethical Issues in Biobank Research

- The collection of tissue biobanking:
  1. The tissue samples collected except the conventional diagnostic treatment, testing, and other intervention that required to obtain in clinical. (Must conform to the principles of the ethical review and informed consent)
  2. Residues of human tissue

The question focus on the informed consent that to which extent should be accepted for biobanks, and what type of informed consent should be adopted in different scenes for better application?

- The discussions below are all based on the details of human tissue residues of biobanking.
The Ethical Issues in Biobank Research

The common sources of human tissue residues:

◆ Surgical diagnosis: While the representative part of tissue sending to the pathologists for diagnosis during the operation, the surgeons can decide to keep or abandon the other fragments of the tissues.

◆ Pathological biopsy: When the amount of the saved tissues satisfied the immediate or future diagnosis purpose, the pathologists can preserved or abandon the residual materials.

◆ Medical test: Once the human samples meet the need of the inspecting diagnosis, the laboratory physicians can store or abandon the remaining tissues.

◆ Others.
The differences of ethical issues between the biobanks and traditional clinical research

- **Traditional clinical research:** It is usually fixed to a particular research project and conformed to *the Declaration of Helsinki*, of which informed consent is taken for drugs clinical trials or other clinical studies involving human. Moreover, it requires the accurate description of research purposes, methods, requirements, risks, possible discomfort, and the expected results, etc.

- **Biobanks research:** The informed consent is used for the research of human tissue residues, of which future features and application can not be clearly identified at the time of signing the consent.
The differences of ethical issues between the biobanks and traditional clinical research

- **Traditional clinical research**: Researchers usually contact with subjects and directly involve in the intervention of human studies, of which ethical risk in reviewing first considers the human safety and health (i.e. the safety and effectiveness), and followed by the consideration of personal information security/privacy problems.

- **Biobanks research**: Researchers usually do not contact with the tissue/sample donors, and the basic research is not directly conducted in the human body, of which ethical issues first consider the donors’ rights and the protection of information security, thus, the risk of human security is rather low (little).
The differences of ethical issues between the biobanks and traditional clinical research

- Based on the various forms of informed consent referred to the current literature of biobanking fields, we can consider the biobanking storage of human tissue residues as a ‘donation’, which is served as a kind of advantaged resources for the medical research and conducive to public interests of the society.

- Someone argued that, it is important to conduct related discussion for the reasonable difference of informed consent recommended by the Declaration of Helsinki. Moreover, it is very necessary to ‘adjust the regulatory measures of different levels according to the interests of the donors involved and different types of biological information materials (including the acceptable types of regulations in informed consent)’.
The differences of ethical issues between the biobanks and traditional clinical research

- Based on the scene of donation, a research in Australia conducted by a series of qualitative interviews for the patients who donated their tissues to the tumor banks. The study shown that most of the participates in the interview expressed their wishes that hope the rest of the tumor tissue donate for research, because its ‘good’ could benefit others, including the family, friends, the current and future members of the disease community, the future generations or casual ‘anyone’.

- Moreover, for the tissue donations of biobanks, the donors also naturally express their concern, of which behavior of donation can benefit others while they never assuming or thinking about the relevant cost/return of their donation.
In conclusion, we can conclude a basic understanding of biobanking research based on human tissue residues as follows:

1. Scenes consideration: Human tissue residues in biobanking storage can be considered as a type of ‘donation’.

2. Risk assessment: Priority to the protection of donors’ information security/privacy.

Based on the understanding above-mentioned, we can consider the data processing of anonymization and the corresponding optional model of informed consent.
Anonymization of the sample and data

- In the study of biobanking research, the anonymization of the sample and data mainly involves the protection of personal data/information. According to the conventional understanding, after the anonymous processing the connection between the originally donating individuals and the data/materials has been removed/deleted.

- According to the related Legislation of European Management Committee of the biological materials research pointed out that as soon as the donors still can not confirm to the related samples/information again after a ‘reasonable effort’, the process of anonymization has been realized, which can be considered as a means of ‘pragmatic’ definition on anonymous processing.
Anonymization of the sample and data

- Two choices of sample/data anonymization in biobanking research

1. Irreversible anonymization of samples: According to the laws, the biological materials of non-identification (non-linking anonymous of materials) refers to the biological materials that still cannot be accessed to relevant information/data recognition while the actual donors conducting a ‘reasonable effort’, of which can be used as the processing of irreversible anonymization.

2. Reversible anonymization of samples: According to the laws, the biological materials of identified recognition are those human tissue samples and/or related information, which can be contacted with the donors directly or through ‘code identification’, thus, it can be used as the processing of reversible anonymization (pseudonymization).

- In addition, this procedure is only applicable to those samples collected in future, rather than those that have been stored before.
The optional model of Informed consent

1、The OPT-OUT consent

The possibility of completely anonymous donating of tissue samples (tissue residues in surgery) is made known for the patients before the surgery, otherwise the tissue residues will be discarded after the operation.

2、The OPT-IN consent

Represented as the signing of informed consent in traditional form before the operation, which is similar to Broad/Presumed Consent i.e. it is unknown of the specific content involved in the future research project while using the informed consent for tissue residues study. This process refers to different methods and possible solutions as follows.
Irreversible anonymization for the tissue samples

- Once the tissue samples taken the process of irreversible anonymization, it can not get any information related to the donors, thus, the privacy of the donors can be effectively protected. However, there will not be any results/information feedback for the connection between the relevant data and the samples of donors has been lost/deleted.

- In this case, it is very necessary to take the ‘presumed consent’ into consideration, which is similar to the responsibility of informing the process of informed consent.
Irreversible anonymization for the tissue samples

- For the optional model of OPT - OUT, it is not a real request of informed consent, of which process of relevant information is responsible by a specific staff in hospitals such as providing related surgery information of informed consent.

- The consent process can be described briefly as follows. First, to collect the samples of tissue residues through a standardized procedure. Second, to inform the donors that the samples will be taken the processing of storage and preservation, of which link/moment that the donors can refuse it. Third, if the donors reply ‘no’ related to the processing, it will mean to be rejected and at the same time the samples will be discarded. Otherwise, if the donors do not answer, it will be deemed to agree and allow the samples to be saved and used anonymously.
Irreversible anonymization for the tissue samples

- The process of irreversible anonymization should be considered as a special kind of procedure, of which kind of sample is not possible to track about the donors' data of medical history, lifestyle, information of personal and health. However, this procedure is also useful as follows.

1. The samples belong to the type of loss.
2. When the donors refuse to offer the tissue residues through the pattern of OPT-IN.
3. For the basic research that unnecessarily providing information about the donors, it is especially a unique resource which applies to the studies of disease-related do not have to get the allowance of actual donors.
Irreversible anonymization for the tissue samples

- Because the overall goal of biobanks is to obtain the samples of information related to the medical history, lifestyle, information of personal and health, it is the primary to choose the pattern of ‘OPT-IN’ from the perspective of discretion.

- In some specific situations and conditions, the pattern of ‘OPT-OUT’ can be used as an alternative options for the pattern of ‘OPT-IN’, which should not be provided at the same time but only as a second choice.
Reversible anonymization for the tissue samples

- In this case, the pattern of ‘OPT-IN’ should be accepted to make clear the relevant information and informed consent because the donors’ samples and data/information is linked by a logo of ‘Coding’. Moreover, while the process of the decision-making of tissue residues donated for the biobanks, the donors knows little about the related information such as the time commitment for sample kept, whether the risks/benefit beyond its initial purpose of tissue-collecting for the diagnosis or treatment, etc.

- In addition, for the features of endlessness towards the residues applying in biobanking, its potential benefit to the society is relatively uncertain, which also makes the donors feel lost for the purpose of participation. Therefore, it should appropriately take the Broad Consent into consideration.
Reversible anonymization for the tissue samples

The informations of Broad Consent are recommended as follows:

- How long will the samples be stored?
- Who has rights to access to the donors' information such as the donors’ name, qualification, degree, etc.
- When in the process of reversible operation, who will be responsible for the links between the samples and data which keeps contacted by a code.
- The samples will be used for what kind of purpose? It is very important to indicate the specific branch at the time, of which research here obtains informed consent from the beginning, then the following analysis do not need to get agree again.
- The value of tissues donating for medical research, etc.
Comparison between reversible anonymization and irreversible anonymization

- The process of irreversible anonymization means a low risk for the behavior of donors. As the application object of biobanks is the society as a whole, rather than a patient of single individual, a presumed consent of silence seems to be satisfied for the process of donation. Moreover, the sample is taken as irreversible anonymization, so it is reasonable to accept the pattern of ‘OPT-OUT’ based on the related research objective, which do not violate the personal rights of patients and respect for patients voluntary decision of donation without any risks of privacy infringement.
Comparison between reversible anonymization and irreversible anonymization

- As the process of reversible anonymization represents a bigger risks such as the invasion of donors’ privacy, the opposition of culture or religion in a particular form of research, and the feedback of results, etc. Moreover, it is the behavior of obvious intention for the donation, so a specific informed consent should be necessary to contain, of which consent belongs to a kind of weak expression in this case accepted the pattern of ‘OPT-OUT’.
Social education of donation in biobanks

- Another ethical issues of biobanks is to promote the plans of educational society and encourage the behavior of sample donation.
- When the donors know the tissue samples are saved for research instead of put aside and their donation behavior can benefit others, the general harmonious concise will be unitied, of which process highlights the importance of the donation behavior of human tissue, thus, the attitude of donation can also be able to sublimate. Therefore, the process of the signing the informed consent by the patients also becomes more trust and voluntary, of which scenes/situation it becomes an automatic response to agree with tissue donation.
Social education of donation in biobanks

- Some studies also pointed out that the all tumor patients had high voluntarily of mentality for the tissue donating for research. Most of the donors thought ‘it is nothing much for it’, because the related tissue residues is now given the new application instead of being discarded, of which processing feels little or no risk for themselves. In addition, although having the feeling of ‘Without too much fuss’ for the behavior of the tumor tissue donation, the donors felt quite satisfied with their behaviors and believed that their donations could benefit others, which also helps to deepen the social reciprocity.
Taking the importance of information processing of biobanking and the decision-making of patients’ donating behavior into consideration, it is necessary for further public debates towards the construction of biobanks.
Discussion

- Another risk of biobanking research is the abuse issue of scientific research oriented data (for other purposes), i.e.
  1. The problem of biobanks attribution;
  2. How to make the use of the sample resources of biobanks? What type or pattern to conduct the authorization or auditing?
  3. How to ensure the research nature of public welfares (or how to audit and manage the process for a commercial research)? etc.
Therefore, some measures should be taken to strengthen the standardized construction in the process of biobanking research.

1. Based on the construction of standardization, the process of management and technical operation in biobanking research should develop and maintain the unified standard, which can make better recognition and control of the risks.

2. For the construction of the quality management system, it can realize the quality control of internal research and accomplish the assurance of external quality (i.e. the society, government and donors).
Discussion

- There are certain concerns existing for the patients’ donating process of tissue residues, such as the infringement of personal privacy, the feedback of information/results, the use of details in donation and the following specifics rules in the form of informed consent, etc.

- Moreover, compared with the informed consent of clinical trials involved in the Declaration of Helsinki, the structures and contents of biobanks are not the same, which do not need to indicate the specified purposes of the biobanking research.

- Therefore, for the existence of the importance and the current situation of tissue donating, some measures should be taken to conduct relevant adjustment of the existing concepts of informed consent and the regulatory of the government.


Acknowledgement

• Thanks to the support of the Ethics Committee of the World Federation of Chinese Medicine Societies (WFCMS)!

• Thanks to the help of jun Liu (刘军) /chairman of committee, Zhaohui Liang (梁兆晖) /secretary of committee and postgraduate Lingfeng Zeng (曾令烽) in the Ethics Committee of Guangdong Provincial Hospital of Chinese Medicine!
The End

Thank you for your attention!