

Students oppinions on DNA banking. Preliminary report.

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ABSTRACT

Introduction: DNA banking is popular in many countries in the world but is little known in Poland.

Purpose: Determine the knowledge and opinions of students of the Faculty of Health Sciences of the Medical University of Białystok about DNA banking.

Material and methods: The study comprised 108 students who volunteered to participate. Data were collected on a questionnaire that was developed by researchers.

Results: Most of the students (72%) had heard of DNA banking; 53.0% from TV, 32.4 % from the Internet, 14.3% from newspapers, and 11% at the University. Of the responding students, 53.4% answered that DNA banking is ethical and beneficial. Nearly 26% decided to bank their own DNA. According to 33.5% of the students, a DNA

sample is venous blood. Only 27.2% of the respondents knew that DNA banking is conducted in Poland, but none of them could name the city where the bank operates. Nearly half of the students (53.5%) reported that DNA banking is a molecular backup. Almost all the respondents (92.8%) wanted to increase their knowledge about DNA banking.

Conclusion: The students' knowledge about DNA banking is poor, however almost all the respondents wanted to increase their knowledge about DNA banking. The main source of students' knowledge about DNA banking was TV and the Internet. Nearly one-fourth of the respondents wanted to bank their own DNA.

Key words: students, opinion, knowledge, DNA banking

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INTRODUCTION

In recent years, there has been a growing interest in human DNA sampling and data collecting [1-4]. DNA banking is long-term storage of an individual's genetic material. DNA is most commonly extracted from blood, and can be banked at any time during a person's life. DNA analysis is an increasingly important source of medically useful information [5].

Most DNA testing companies offering DNA banking services provide DNA storage for 15 to 20 years [1]. In Poland, DNA banks store human genetic material for 40 years.

One of the most compelling justifications for DNA banking, not only in Poland but also worldwide, is that parents can collect and bank their children's DNA to serve as a permanent record of their genetic identification in case they need this resource. This is especially beneficial for members of families with medical histories of inherited diseases and terminal illness [1,3]. For monogenic diseases, current linkage methods are now efficient in identifying mutant genes, depending mostly on the total amount of family structures and DNA samples available. DNA banking is also expected to play an important role in pharmacogenetics [6].

Though there are many scientific justifications for the creation of tissue and DNA databanks, the storage and use of human tissue continue to create legal dilemmas [3,5].

Regulations pertaining to the storage of human biological materials are at their beginning stage in most European countries. The multiplicity of actors and the rules that regulate them (public and private, hospitals, laboratories) make the situation increasingly difficult to comprehend [7].

As a consequence, ethical principles for the prospective use of human genetic material have been introduced in several European countries. The British Clinical Genetics Society and the Danish Council of Ethics emphasized the quality assurance of banked tissue samples and consequently the origin of samples that may be banked [4].

In France, the 1994 Bioethics Laws mandated that 'no person may take samples with a view to constituting a collection of human biological specimens, or use, to this same end, samples already taken or derivatives thereof if they have not notified the competent administrative authority of the proposed collection' [4].

The establishment of independent oversight bodies for all large genetic databases is suggested.

Many people express positive opinions toward genetic research and the donation of DNA specimens [8-10] but these data were collected among non-Polish population.

To our knowledge, no study about DNA banking has been conducted with students, and therefore it is unknown whether Polish students are willing to donate blood to DNA banking. The purpose of this study was to determine the knowledge and opinions of students of the Faculty of Health Sciences of the Medical University of Białystok about DNA banking.

MATERIAL AND METHODS

The study comprised 108 nursing students of the Faculty of Health Sciences of the Medical University of Białystok, and used a questionnaire specially designed for the purpose of this study. The questionnaire consisted of two parts, with the first part containing questions regarding: age, gender, year of study, and faculty. The second part was composed of questions relating to: DNA banking in Poland, sources of knowledge about DNA banking, opinion on whether the DNA banking is ethical and beneficial; willingness to take part in DNA banking, either on their own or within their family; knowledge of the year in which the British Association for Clinical Geneticists stressed the need for DNA banking from the dead before their burial; technique of DNA sampling; desirability of DNA banking; legislation of DNA banking in Poland; security of database DNA, and whether students want to increase their knowledge in this field.

This survey was voluntary and anonymous; no informed consent was required, and returning the answers was recognized as consent to study participation.

RESULTS

The group study included 108 women. Students were between 20-28 years of age, with a mean of 23.1 ± 2.1 years. Most of the respondents (72%) had heard of DNA banking: 53.3% from TV, 32.4% from the Internet, 14.3% from newspapers, 11% at the University, 4.4% from friends, and 3.6% from radio. Of the study participants, 31.7% reported that DNA banking is ethical, 10% stated that it is not ethical, and 30.9% did not have an opinion. Nearly 26% decided to bank their own DNA and 41.7% wanted their family members to decide for DNA banking. In contrast, 19.0% were opposed to their own DNA banking and 18.1% to their family members. Nearly half (54.5%) of the students did not have an opinion. Almost 71% of the respondents did not know the year when the British Society for Human Genetics stressed the need for DNA banking from the dead before their burial. About half (53.5%) of the students reported that DNA banking is beneficial, while 5.4% felt it is not, and 41% did not have an opinion. According to

the students, a breakdown of DNA sources was as follows: 33.6% stated venous blood is sourced for DNA, 20% arterial blood, 3.6% hair and 1.7% tissue and swab from the mouth. The percentage of students not having an opinion was 37.2%.

Only 27.3% of the students knew that DNA banking is conducted in Poland, but none of them could name the city where the bank operates. Of the responding students, 53.6% answered that the desirability of DNA banking is justified as a molecular copy in cancer and genetic disorders, 27.3% in gene therapy, 23.6% in identification of missing persons, 9.1% in aging and 4.5% in inheritance. Almost all the students (99.9%) answered that there is not legislation of the DNA banking in Poland.

Of the respondents, 49% were convinced that DNA samples are safe in the bank, 10% had a contrary opinion, and others did not have an opinion.

The vast majority of the students (92.8%) wanted to increase their knowledge about DNA banking. Only 2.7% did not want to increase their knowledge about it and 4.4% did not have an opinion.

DISCUSSION

Human DNA banking, tissue or cell collections, as well as databases, which are attached to such biological resources, are necessary for a wide range of purposes and these collections have been extensively exchanged for scientific purposes. On the other hand, the status of collections is not very well known and most laboratories that bank DNA have no written policies or agreements regarding this activity [2].

DNA banking is very popular in many countries, including the United States. In 1989, it was the British Society for Human Genetics that stressed the need for DNA banking from the dead. In the present study, most of the students did not know this statistic.

In Poland, the first DNA bank was established in Wroclaw [11]. Three-quarters of the respondents knew that DNA banking is conducted in Poland.

Only one-fourth of the students wanted to bank their own DNA and almost half answered that DNA banking is beneficial. The main source of students' knowledge about DNA banking was the Internet.

At the present time, there are four kinds of DNA banks: academically-based repositories housed in the laboratories of scientists who are studying genetic disorders, commercially-based repositories that offer DNA banking as a service to researchers and individuals who may have some reason (e.g., family history of cancer) to store their DNA in anticipation of the development of a

linkage test that might benefit their children and grandchildren; state-based DNA forensic banks intended to assist in the resolution of violent crimes by comparing biological specimens from a crime scene; and DNA banking by the military to help in the rapid identification of human remains [12].

To our knowledge, no other study had been conducted among students on the opinion and knowledge about DNA banking, so it is difficult, if not impossible, to compare our findings with other reports. In the present study, most of the students showed a positive attitude toward DNA banking.

Our findings were consistent with previous studies conducted on DNA banking among respondents other than students [13-16]. Comparable results were reported by Japanese patients [13], with the majority showing a positive attitude towards pharmacogenetics research (87.6%) and a DNA bank (75.1%). In the U.S. report, nearly all respondents (98.7%) believed the DNA Databank is very important.

"There was a serious dilemma," stated Professor Bracha Rager, a member of the Helsinki Committee and a scientist at Ben-Gurion University [14]. According to Rager, new moral issues are raised: Who actually owns that genetic information? Is the genetic profile of a certain ethnic group a commercial resource or a resource that belongs to the community? And is a private company entitled to own the information?

In the present study, one-third of the students had no moral dilemmas about DNA banking but a similar proportion of the respondents did not have an opinion.

DNA is now being used in epidemiologic investigations to study genetic risk factors. The latter include rare gene mutations, such as the BRCA1 mutation, which confers high risk for breast or ovarian cancer, as well as genetic polymorphisms, such as the polymorphic genes that code for carcinogen-metabolizing enzymes that affect the way people process carcinogens, thereby increasing or decreasing their risk for sporadic forms of cancer [17-19].

In our study, nearly half of the students stated the desirability of DNA banking as a molecular copy in cancer and genetic disorders.

No clear national or international consensus exists on key issues of tissue banking. During recent years, the harmonization of norms needed for international collaboration has made crucial progress solely in Europe, namely through legal framing. The norms relating to tissue banking are, however, under permanent construction not only in Europe but also throughout the world [20]. In our study, almost all the students answered that there is not legislation of the DNA banking in Poland.

Data storage and DNA banking are receiving increasing attention as a result of the

explosion of genetic research. Similar to what has occurred in Iceland, large population-based studies have been set up or are planned at a national level in several countries including Estonia, Singapore, Tonga, and the UK [7]. International standardization of ethical requirements and policies with regard to the use of DNA samples and information has been recommended [21]. Such standardization would facilitate a greater protection of individuals as well as future international cooperation in biomedical research.

This study has several limitations. First, the only students participating in the study were nursing students, and second, our sample of students was small (n=108), which included only women.

CONCLUSIONS

1. The students' knowledge about DNA banking is poor, however almost all the respondents wanted to increase their knowledge about DNA banking.
2. The main source of students' knowledge about DNA banking was TV and the Internet.
3. Nearly one-fourth of the respondents wanted to bank their own DNA

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