The Spanish National Tumor Bank Network: An Inspiring Example

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When the Spanish National Center for Cancer Research (CNIO) was beginning to take shape in 2000, its founding director Dr. Mariano Barbacid and the head of the CNIO’s Molecular Pathology Program, Dr. Miguel Ángel Piris, approached Dr. Manuel Morente to set up and direct a tumor bank for the Center. Manuel Morente had been working as a pathologist in different Spanish hospitals for more than twenty years, and brought an outgoing personality and a creative mind to the job. Ten months later, the Spanish National Tumor Bank Network (SNTBN) was operational. As the name implies, the SNTBN is not a centralized tumor bank, but represents a coordinated network of cooperating hospital banks. In its first year, the SNTBN consisted of seven hospital banks plus the CNIO. At present, the number of participating hospitals has grown to nineteen, and several more hospitals are foreseen to join the network in the near future. Its design, elegant in its simplicity, is pioneering in Europe and its success serves as an inspiring example for emerging networks in Europe, Latin America, and Asia.

What is a tumor bank, and why did the CNIO feel the need to have one?

M. Morente: When a cancer patient is operated on, the tumor plus some surrounding healthy tissue is surgically removed. The malignant tissue is examined by a pathologist, and this examination serves as a basis for further treatment of the patient. More often than not, there is tissue left over that is not required for further diagnosis, and these tissue samples are stored fixed or frozen in the hospital for future research. Such a collection of neoplastic specimens plus control non-neoplastic tissue is called a tumor bank.

Unlike many cancer centers, the CNIO is fundamentally a research center, and does not have its own cancer clinic or associated hospital. Basic cancer research is often carried out using cultured cells, and although this type of research continues to lead to very important findings, cells in culture can faithfully mimic tumors only to a certain extent. Likewise, the use of animal models to investigate cancer in humans has its obvious limitations. A tumor bank, however, allows one to assess and verify the clinical relevance of the basic findings, and thus provides an essential link between basic and applied research. Moreover, recent progress in genomics and proteomics, and concomitant advances...
in high-throughput screenings, has made large-scale molecular studies of tumors possible. Evidently, a tumor bank provides an invaluable resource of tissue for this type of investigation.

**How does the SNTBN function?**

*M. Morente*: The SNTBN is a cooperative network of tumor banks from independent hospitals, and the CNIO works out a contract with each associated center.

For a hospital tumor bank to be able to associate itself with the Network, it must fulfill a number of criteria. Some of these are evident, such as the requirement to have adequate material resources for the correct handling and preservation of tissue. Other criteria are aimed at avoiding the intrinsic bias of multi-center studies, since the process of tissue handling usually varies from hospital to hospital. The centers initially associated with the Network worked out standard operating procedures for the collection, processing, and storage of biospecimens, and these must be followed by all members. The central office at the CNIO for its part provides each hospital with specially designed software, coordinates the Network, maintains the central database, and performs periodic quality controls.

Any Spanish cancer research team can request tissue from the Tumor Bank Network. To do so, it must send an explanatory report of the project to the central office. An anonymous assessment mechanism is used to appraise the scientific and technical viability of the project, unless the project has already been favorably judged by the Spanish National Evaluation Agency. It is then the responsibility of the central office to find sufficient cases in the central database that meet the requirements of the project, and to send the tissue to the research team.

**What do the participating hospitals stand to gain in forming part of the network?**

*M. Morente*: First of all, I would like to mention that the participating centers are under no obligation to send requested tissue specimens, and that each hospital is free to use them for their own research activities. That being said, an important benefit for a participating hospital is to have access to additional tissue to be able to carry out studies on a larger scale. When it is necessary to limit access to a particular type of tissue due to scarcity of samples, absolute priority is given to projects whose principal researcher belongs to one of the members of the Network.

Apart from that, the CNIO offers certain services to the associated centers, chief among which is the training of medical specialists, pre- and post-doctoral researchers, and technicians of the associated centers.

With this set-up, we intend to pursue broader goals than the mere availability of tissue. The Network also aims to encourage multi-hospital cancer research, and to promote cooperation between basic and clinical researchers.

**How does the network deal with the ethical aspects involved?**

*M. Morente*: Patients who are willing to cooperate sign a document of informed consent, indicating their approval that tissue remaining after histopathological diagnosis may be used for research purposes. In no case will the correct diagnosis of a sample be compromised, or special or additional maneuvers be carried out on the patient, because of the collection of material for the tumor bank.

We have gone to great lengths to safeguard the privacy of individuals contributing tissue samples to the bank. No information that permits the identification of the patient is sent to the central database. Data are communicated over a secure telephone line, and the Network’s computer application has been developed with special reference to security mechanisms that regulate access to information.

Finally, the protocols of the tumor bank network have been studied and approved by the Ethics and Research Committees of each hospital, before signing the collaborative agreements. All these measures aim to maintain the highest possible ethical standards.

**Do you think you are setting a trend that should be followed elsewhere?**

*M. Morente*: A network like ours was inconceivable a mere ten years ago. Its establishment has been made possible through recent advances in genomics, proteomics, biotechnology, and information technology. Consequently, the idea has materialized independently in different disciplines and in different countries.

If we limit ourselves to the field of general oncology, several networks have emerged in Europe after our own. Two examples are the National Cancer Tissue Resource that was recently launched in the UK, and TuBaFrost, an initiative of the Erasmus Medical Center in Rotterdam in close collaboration with the European Organization for Research and Treatment of Cancer to create a virtual European human frozen tumor tissue bank, which is under development. Other examples can be found in several Spanish regions, and in countries such as the Republic of Ireland and Italy. These networks have similarities and differences with our Network, and there is interaction between us to learn from each other’s experiences. I would therefore say that we are amongst the trendsetters, but by no means the only ones.

I am convinced that we will also see tumor bank networks arising in Latin America, and we are actively involved in training courses on tumor banking throughout the region. In other countries, such as the United States, commercial interests often preclude collaborative agreements between hospitals for the mutual provision of services.

It is generally recognized that access to many tissue samples will considerably accelerate cancer research, and tumor bank networks are an excellent way to achieve this. I therefore expect more regional, national, or international networks to appear in the foreseeable future. Europe has a great opportunity to create well-organized cooperative networks, but the appropriate European Directive should start forming a common legislative body for all European countries, to allow the development of international multi-center studies without the current plethora of legal difficulties.

I think cancer patients and society will greatly benefit from initiatives like ours, and in the end that is all that counts.

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