

Establishment of a Tumour Bank: the experience of the Department of Pathology of Hospital S. João (Porto, Portugal)

Marta Rodrigues · Isabel Vitó · Raquel Santos · Joel Paiva · Patrícia Pontes · Paula Silva · Fátima Carneiro

Received: 19 February 2008 / Accepted: 21 June 2008
© Springer Science+Business Media B.V. 2008

Among bio-banking initiatives, tumour banking plays a pivotal role in biomedical research. The general aim of a Tumour Bank is to acquire neoplastic and control non-neoplastic samples, in standardized conditions for research (basic, clinical or translational). A Tumour Bank is a vital new resource for cancer research; it provides high quality, well-characterized tissue to promote and advance cancer research. Among numerous initiatives on tumour banking, EORTC-TuBaFrost Network provided an innovative virtual (networked) European human frozen tumour bank and generated valuable recommendations on tumour banking (Isabelle et al. 2006; Mager et al. 2007; Morente et al. 2006; Riegman et al. 2006; van Veen et al. 2006).

Herein, we describe the steps followed for the establishment of a Tumour Bank in Hospital S. João—Porto: (i) Application to “SAÚDE XXI Program” for funding; (ii) Approval of informed consent by Ethical Committee of Hospital S. João; (iii) Legalization of the data base by the National Commission for Data Base Protection (“Comissão Nacional de Protecção de Bases de Dados”), according to the requirements of Portuguese law; (iv) Establishment of Standardized Operating Procedures (SOP) for all activities and quality control. The Tumour Bank is localized in the Department of Pathology. Establishment was supported by PRAXIS XXI Program (75%) & Hospital S. João (25%), and running costs are supported by Hospital S. João and NOVARTIS Oncologia, the latter providing a grant for a biologist. The activity of this Tumour Bank is no profit. General principles on data protection and informed consent established in Portuguese Law for biobanks (no. 12/2005, I-A, no. 18—January 26, 2005) were strictly respected. In Portugal there is no specific legislation on Tumour Banks.

For the rapid collection of samples for the Tumour Bank, a small Laboratory was installed within the Surgical Centre. All samples are collected by trained staff (pathologists and/or residents). As soon as the sample is delivered, a gross examination is performed and representative samples of tumour and non-neoplastic tissue are collected. Only excess tissue is collected and, in no case, may the correct diagnosis of a sample be compromised by reason of the collection

Presented at the International Consensus Meeting “New Horizons in Cell and Tissue Banking” on May 16–20, 2007 at Vale de Santarém, Portugal.

M. Rodrigues · I. Vitó · R. Santos · J. Paiva · P. Pontes · F. Carneiro (✉)
Department of Pathology, Hospital S. João, Alameda Professor Hernâni Monteiro, Porto 4202-451, Portugal
e-mail: fcarneiro@ipatimup.pt

P. Pontes · P. Silva · F. Carneiro
Institute of Molecular Pathology and Immunology of the University of Porto, Porto, Portugal

P. Silva · F. Carneiro
Faculty of Medicine, University of Porto, Porto, Portugal

of material for the Tumour Bank. The samples are immediately snap frozen in liquid nitrogen (time lag between excision of the tumour and sample collection is registered in every case). Additionally, “mirror/twin” samples of tumour and non-neoplastic tissue are collected for paraffin embedding. From these samples, H&E stained slides are used for morphological control of “mirror/twin” frozen samples. Currently, a virtual bank is being constructed with digital virtual histological images of samples stored in the Tumour Bank. Additionally, a Laser-Capture Microdissection facility is available.

Informed consent is obtained from the patients before surgery, being requested by the Clinicians in charge of patients’ care. Patients approve that surplus tissue remaining after its use for correct histopathological diagnosis may be used for biomedical research, safeguarding the principle of confidentiality and Data Protection Law. Patients can remove the consent and, in this situation, the respective samples are destroyed.

A data base system was constructed to administrate, for each sample, the following informations: (i) identification data (local case code; date of birth; gender); (ii) pathology data (date of pathological study; anatomical location of neoplastic process; complete pathological diagnosis; histological grade; stage (pTNM); primary or relapse tumour; available material; sample type (biopsy, surgical specimen, autopsy material, fine needle aspirate); (iii) Storage location in -80°C freezers. Only authorized staff can access information of the data base. Tissues used in research projects are anonymized. Material for research projects is only supplied after the research protocol is approved by the Medical Ethical Committee of Hospital S. João, which reviews also the scientific merit of the requests.

Tumour Bank at Hospital S. João comprises samples of the most frequent solid tumours (gastric, colorectal, mammary and thyroid) and “normal” (non-neoplastic) counterpart tissue collected at the distance from the tumours. Currently, the Tumour Bank encompasses about 4,000 frozen samples.

The whole process of establishing the Tumour Bank at Hospital S. João took about 2 years. Major operational problems concern shortage of human resources (efforts are being done in order to include in the annual budget of the Department the request for recruiting personal for the Tumour Bank) and difficulties in

obtaining informed consents (efforts are being made close to Clinicians in order to get their collaboration).

Other initiatives in tumour banking are being developed in Portugal. In order to have an insight in those initiatives, a questionnaire was conducted, at the national level, by the National Coordinating Body for Oncological Disease (“Coordenação Nacional para as Doenças Oncológicas”) from the Portuguese Office of the High Commissioner for Health (“Alto Comissariado da Saúde”), a central service of the Health Ministry. A summary of the results of this questionnaire is available at the website of the National Coordinating Body for Oncological Disease (www.acs.min-saude.pt/2008/01/11/redenacionalbancotumores). A total of 86 institutions were surveyed, from which 46 replied. Currently, there are 10 initiatives in tumour banking at different stages of establishment (four of these Tumour Banks are fully legalized according to the Portuguese law). Other initiatives are at the phase of requiring approval of databases by the National Commission for Data Base Protection ($n = 4$) and two Centres participate in the activities of the Tumour Bank group in the quality of observers.

Currently, efforts are being done to establish a national network of Tumour Banks in Portugal, encompassing initiatives to construct a national data base for Tumour Banks and elaboration of a document on “The minimal requirements for the establishment of a Tumour Bank” (available at the webpage of the National Coordinating Body for Oncological Disease (http://www.acs.min-saude.pt/wp-content/uploads/2008/01/requisitos_bancotumores.pdf)). In this document, the following issues are addressed: (i) Staff (pathologist(s)/resident(s); technician(s); full/part time); (ii) Legal/ethical (informed consent; legalized data base); (iii) Technical (equipment; protocols for sampling, freezing and storing); (iv) Quality control.

Further, a Workshop was recently organized in Lisbon, Portugal on “Biobanks: a tool for research in the 21st century”, aiming at providing information to the scientific community about the goals of Biobanks with an emphasis on Tumour Banks and DNA Banks (presentations available at <http://www.acs.min-saude.pt/2008/05/08/biobancos?r=16>).

Acknowledgements Funding for the establishment of the Tumour Bank was provided by SAÚDE XXI Program (SIFEC 15-02-01-FDR-00235/Medida 2.1) and Hospital S. João. Marta Rodrigues has been the recipient of a research grant from NOVARTIS Oncologia.

References

- Isabelle M, Teodorovic I, Morente MM et al (2006) TuBaFrost 5: multifunctional central database application for a European tumor bank. *Eur J Cancer* 42:3103–3109. doi:[10.1016/j.ejca.2006.04.032](https://doi.org/10.1016/j.ejca.2006.04.032)
- Mager SR, Oomen MH, Morente MM et al (2007) Standard operating procedure for the collection of fresh frozen tissue samples. *Eur J Cancer* 43:828–834. doi:[10.1016/j.ejca.2007.01.002](https://doi.org/10.1016/j.ejca.2007.01.002)
- Morente MM, Mager R, Alonso S et al (2006) TuBaFrost 2: standardising tissue collection and quality control procedures for a European virtual frozen tissue bank network. *Eur J Cancer* 42:2684–2691. doi:[10.1016/j.ejca.2006.04.029](https://doi.org/10.1016/j.ejca.2006.04.029)
- Riegman PH, Dinjens WN, Oomen MH et al (2006) TuBaFrost 1: uniting local frozen tumour banks into a European network: an overview. *Eur J Cancer* 42:2678–2683. doi:[10.1016/j.ejca.2006.04.031](https://doi.org/10.1016/j.ejca.2006.04.031)
- van Veen EB, Riegman PH, Dinjens WN et al (2006) TuBaFrost 3: regulatory and ethical issues on the exchange of residual tissue for research across Europe. *Eur J Cancer* 42:2914–2923. doi:[10.1016/j.ejca.2006.04.028](https://doi.org/10.1016/j.ejca.2006.04.028)