Talk Abstract

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Tissue Banking in Morphological and Molecular Diagnostics

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Tissue biobanking at a pathology department of an academic hospital is instrumental for creating a solid basis as a resource of well documented human material for medical translational research. At the Pathology department surgical resection specimens arrive for further diagnosis. The routine pathology archival formalin-fixed and paraffin-embedded (FFPE) material can form a large resource for research. However, the derivatives DNA, RNA, and proteins can be of too poor quality for the foreseen research. If tissue samples are fresh frozen the molecular capabilities are much stronger. Such tissues can be used for many more scientific experiments. For procurement of high quality samples it is important to work with standardised procedures and have quality assurance and quality control program over procedures described in standard operating procedures.

A tissue bank at a pathology department has to cope with a high molecular demand of the samples and that makes the relationship with the molecular pathology a logical one. Incorporating the tissue bank within a molecular pathology unit makes both can share from each other's experiences. The molecular pathology unit can on top benefit from the availability of material for research.

At Erasmus MC molecular pathology research is amongst others performed on samples of esophageal cancer, feochromacytoma, colon cancer, head and neck etc etc, resulting in better patient care. The relation between both tissue bank and molecular pathology is important to learn on the quality issues.

Quality issues comprise alarm systems on freezers that call the biobank personnel when problems occur. However, also new quality issues are arising due to the fact that multi-center translational research, which is needed for high impact research with high statistical power to have sufficient critical mass in sample number. Such experiments are needed to have impact on patient care and contribute to fields like personalised medicine, drug target identification and prediction of outcome. Even the largest institutes are not able to collect such high numbers in a foreseeable time, especially those with long-term follow up. Therefore, samples and data need to be exchangeable and development of external quality assessment seems unavoidable.

Such quality issues are under investigation in the SPIDIA project. This European framework 7 project has the aim to improve the standardisation and pre-

analytical procedures for *in vitro* diagnostics. Also new opportunities for tissue banking, like evidence-based biobanking and the development and testing of an alternative fixative for Formalin called the PAXgene® Tissue System. This system has the capability to preserve tissue morphology comparable to formalin and next to that conserve the molecular aspects better than formalin. This could be a wonderful opportunity for molecular pathology to expand on the molecular capabilities and for research to enable investigation of materials that were so far out of reach because all tissue was needed for research. To completely replace formalin is too big a step. Best is to consider those areas where an advantage can be made. Implementation of such an alternative fixative needs to be done step by step and with the proper consideration and testing first every aspect of the possibly encountered diagnostic applications.