



## Sample integrity project aims to set standards

# “The pre-analytical phase is the foundation for every study using biomaterials”

Professor Hein Verspaget (l) and Dr Peter Riegman: “We just want to know.”

**BBMRI-NL has launched a new work group: “Sample integrity - documenting the prerequisites for reliable research using biomedical resources”. The group, headed by Professor Hein Verspaget of the LUMC, aims first to find out what knowledge is available on how to best preserve sample integrity, and secondly to perform tests to establish the best means of preserving different types of materials.**

To perform accurate and valuable research using tissue, blood and other biomedical resources, it is vital that the materials used are kept under circumstances that don't meddle with their characteristics - for example, by oxidation or dehydration. This appears so self-evident, that one would expect there to be a ready and well-established catalogue of protocols on how

to treat samples. But the truth is different: extensive research on the subject has not yet been conducted.

“At least, not that we know of”, says Professor Verspaget, who as coordinator of both the regular LUMC biobanks and the Parelsoer ones at the LUMC has made sample integrity one of his points of focus in the last three years. “There is surprisingly

little literature available. A query among University Medical Centres (UMC's) and international biobanking organizations brought to light a few unconnected articles, and a recent BBMRI-NL Complementation project provided further reading matter. But that was about it.”

Reason for the newly appointed project group to start off their research by conducting an extensive literature study. “So far, we haven't had someone devote their entire day to searching for literature on the subject. Hopefully, in half a year's time we will be able to publish an article on just what is available and what is wanting—worldwide.”

### Standardization

Dr Peter Riegman of the ErasmusMC is a member of the project group. Establishing conditions for preserving sample integrity had long been on his priority list: “I've been working with tissue and blood for over twenty years, both in the ErasmusMC and in collaborations with other UMC's and international studies. I am always going on about how we need to make sure that the samples are treated correctly, and in a standardized fashion - or, if that is unfeasible, that at least the different treatments be well-documented.”

“If you conduct research, using for instance DNA that has been frozen, alongside DNA that has been kept at 4 degrees Celsius, you will get different results from the two types of samples. So it is important that you, and everyone subsequently involved or interested in your research, is aware of that. Standardization of samples across institutions is the ideal, but cannot always be achieved; let's face it, if an institution has worked in one type of way for tens of years, switching to a new method is not only a big adjustment, but might also invalidate your 'old' samples. No-one wants that.”

“That is not our aim”, explains Verspaget. “What we do want to achieve, is awareness, first of the available literature - perhaps after publishing we can build a portal or some other online instrument for researchers to use - and secondly filling up the blanks: building knowledge on what the ideal conditions for preserving several kinds of materials are, and how analytics techniques affect materials.”

### Collaboration

That doesn't mean starting from scratch: “We have struck up collaborations with

some companies that provide lab materials, for instance Thermo FisherScientific and Illumina, because they have very specific knowledge pertaining to the use of their products. We want to build on that basis, and start up a kind of manual for standardization - and notification”, argues Verspaget.

“By that, I mean that collaborative research can and should share information about just which steps they want to take in any phase of a project, because sometimes the way you store materials affects one part of its properties, but not all. And that can lead to a situation where one institute, in good faith, preserves samples at say -20 degrees, when another institute is planning to conduct analyses which require for the materials to be frozen at -80, because they need whole blood cells for example. The lack of communication on that point can lead to - in fact, in my own recent experience, has led to - loss of sample integrity and thereby the loss of the opportunity to conduct reliable research on those samples.”

### Pre-analytics

“Everybody wants to conduct good research”, says Peter Riegman. “But in creating the circumstances for excellent research, the pre-analytical phase is often all but overlooked. It is assumed that the conditions under which samples are collected and stored will be the right ones - a very unscientific way of thinking, really. Why, when we want to establish facts, using hard, empirical evidence and solid statistical inference, do we settle for an assumption? Biomaterials are the foundation of all research, so surely it must matter to everyone in research to treat these materials in the correct fashion.” And, adds Professor Verspaget: “We just want to know.”

### Hein Verspaget appointed Professor of Biobanking

In December 2014, Hein Verspaget was appointed Professor of Biobanking at the Leiden UMC. It is the first time a Dutch University Medical Centre (UMC) appoints a professor in this area of expertise. Prior to his appointment, Verspaget had already been coordinator of the LUMC Parelsoer biobanks as well as the 'in-house' CuraRata biobanks for three years.