Ocular Update

**Berlin institute provides a new perspective on eye surgery-related pathology**

The recently established Berlin Eye Research Institute (BERI) brings a broad range of expertise to the pathological analysis of intraocular lenses and other implantable ocular biodevices and the investigation of new ophthalmic technologies.

Founded in April 2005 by Prof Manfred Tetz MD PhD, BERI is an independent non-profit institute that has the primary aim of creating a European data pool on intraocular implants and eye surgery-related pathology. Dr Tetz, who is BERI's scientific director, has worked in the field of ocular pathology for over two decades, including a two-year post-doctoral fellowship at the Storm Eye Institute in South Carolina and the Department of Ophthalmology, University of Utah, in Salt Lake City, Utah.

"The idea for the institute was raised several years ago because there are a lot of new developments in ophthalmic implants, lenses and so forth that are currently taking place outside the US, but nobody is scrutinising and watching what potential complications are associated. That is why we said, with all the personal expertise we have, this would be a perfect set-up to encourage people to send specimens, explanted lenses and autopsy eyes for examination without any cost," Dr Tetz told EuroTimes in an interview.

**The BERI team**

Liliana Werner MD PhD became the newest member of the BERI team in August 2006, when she became the institute's director of pre-clinical research. Dr Werner has a well-established reputation in the field of anterior segment research. At the Storm Eye Institute and the John A Moran Eye Centre, she played an instrumental role in the development of an ongoing programme of pathological analysis of explanted IO LS.

"Since 1999 I have been fully dedicated to research on intraocular lenses, and related complications. This involves experimental studies in animal models and cadaver eyes, when we evaluate the design and biocompatibility of new lenses for example, and also analysis of intraocular lenses and other ocular devices that may be explanted because of different complications," Dr Werner said.

Dr Werner's previous research includes collaboration in several groundbreaking studies on factors related to capsular bag opacification. The studies established that the square edge is the most important IOL design feature for PCO prevention, and that lenses composed of materials that form a bioactive bond with fibronectin of the lens epithelial cells can also have an influence on the outcome of capsular bag opacification. Dr Werner was also involved in studies describing different causes of IOL opacification, such as hydrophilic acrylic IOL calcification, calcification of silicone IOLs in asteroid hyalosis, among others.

"At the BERI we are focusing on IOLs and other ocular devices that are explanted in Europe and Asia. We are therefore analysing specimens not really available in the US, which greatly complements the information gathered from previous studies at the University of Utah. In 2006 we received at the BERI around 70 specimens, including many phakic and pseudophakic IO LS not available in the US," she noted.

Other members of the BERI team include Bernhard Febrer Bowen MD, coordinator for development of new ophthalmic applications; Matthias Müller Dipl-ing, engineer for medical physics and the coordinator of clinical research and wet labs; Katherina Dumke OD, optometrist certifier for European studies; and pathologist Mona Tawfik MD.

Dr Bowen has a special interest in the development of new applications for the treatment of presbyopia and community-based health awareness models for age-related ocular pathology.

In 2005 he founded the International Society of Presbyopia and was chairman of the first International Congress of Presbyopia in 2006 in Barcelona. Matthias Müller is responsible for the computerised infrastructure and the technical aspects of different research projects. Furthermore, he organises wet labs and provides support to medical doctoral candidates and trainees. His previous work in ophthalmology includes research into the use of an excimer laser to create donor grafts for transplantation.

**BERI collaborators**

Dr Tawfik works with BERI on a collaborative basis. She runs a private Institute of Pathology in Berlin, which offers a complete service in surgical pathology, cytology, and autopsy. Their lab supplements conventional histopathology with molecular techniques, including immunohistochemistry, DNA cytometry, and in vitro hybridisation.

Others who collaborate with BERI include Jörg Nissen Dipl-ing, at the Technische Universität, Zentraleinrichtung Elektronenmikroskopie, Berlin, who provides scanning electron microscopy, and surface analysis; Gerhard Kalinka, PhD, at the BAM Federal Institute for Materials Research and Testing, Berlin; Dr Joachim Storsberg and Dr Eckhard Görtzitz, at the Fraunhofer Institut, Potsdam provide specialisation of implant materials.

In addition, Prof Holger Dietze at the Elektrotechnik und Feinwerktechnik Studiengang Augenoptik/Optometrie, Berlin, provides optical analysis of new lenses and implant materials.

"We do some simulation testing with the optometric institute. This kind of thing is becoming more and more important in lenses these days because a lot of the new changes in the IO LS are actually optical changes," Dr Tetz noted.

Wet labs also represent a significant portion of the BERI's activities. Participants perform experimental surgery with human or animal post-mortem eyes for the evaluation of new techniques or devices. BERI also organises practical courses for the teaching and practising of already well-established or new techniques.

"The BERI has a very good structure for wet labs, which are organised so surgeons can practise experimental implantation of new lenses, or new surgical techniques, before using them in real patients. Lectures are organised, with direct transmission of live surgery from Manfred Tetz's surgical operating room with interaction between surgeons and participants. At least six stations with operating microscopes connected to a video system are available for experimental practice in pig eyes or others," said Dr Werner.

Surgeons and doctors interested in sending explanted lenses, post-mortem pseudophakic human eyes and other explanted ocular devices for pathological analysis can download the related submission forms from the BERI website at www.berlin-eye-research-institute.de which may also be accessed through the ESCRS website at www.ecrs.org.

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