

NIIOS Newsletter

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NIIOS TEXTBOOK ON DMEK

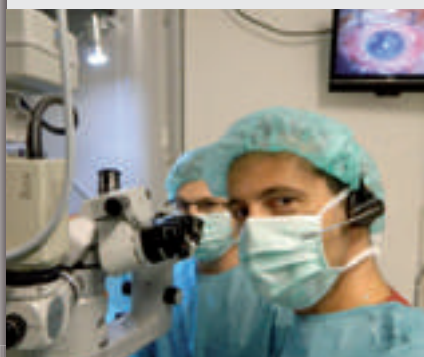
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REFERRALS TO MELLES CORNEA CLINIC ROTTERDAM

For referrals to Melles Cornea Clinic Rotterdam, please use the referral form enclosed, or download it from www.nijos.com. Please fax the referral form to +31 10 297 4440 and one of our international secretaries will make further arrangements.

To contact us by e-mail, please write to info@corneaclinic.nl

Could Hemi-DMEK double the availability of endothelial transplants?

DMEK shows further evolution

There may be few 'endpoints' in science, if any. Descemet membrane endothelial keratoplasty (DMEK), the most advanced endothelial keratoplasty technique currently available, may not be an exception. Various technical modifications are currently being investigated, e.g. air- or gas-bubble times to secure the graft's position onto the host posterior stroma, dissection techniques including Dua's layer, a range of injectors for Descemet membrane (DM) implantation, and instruments for stripping the host DM. All of these ideas may further facilitate the concept of DMEK, i.e. the selective replacement of DM and its endothelium in the management of corneal endothelial disorders.

However, DMEK may also show further evolution on a meta-level: repopulation with recipient endothelium may question the necessity of a 'keratoplasty', and donor tissue may be used more efficiently. Thus, both scenarios seem to be unfolding parallel to each other, fueled by clinical or logistic interest.

First, in eyes operated on for Fuchs endothelial dystrophy, the cornea may still clear with a graft floating in the anterior chamber (Descemet membrane endothelial transfer, DMET).¹ In bullous keratopathy eyes, such 'spontaneous clearance' did not occur, indicating that the host endothelium should be involved in Fuchs eyes. This questions the disease classification as a 'dystrophy', and could allow for a different or differentiated approach in the treatment of corneal endothelial disorders.

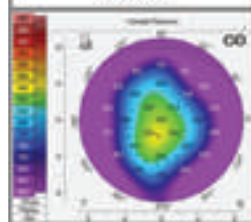
Second, in the past eight years, DM-grafts have been transplanted with various shapes and/or imperfections. When inadvertent tearing occurred during tissue preparation, the donor DM was trephinated eccentrically or damaged areas were removed to avoid loose 'tissue tags'. Since no clinical adverse effects were observed with these transplants, we recently started evaluating half-moon shaped DM-grafts, i.e. an 11.5-12.0 mm semi-circular graft. Since two semi-circular grafts can be obtained from one donor cornea, this approach may potentially allow twice as many DM-grafts to be harvested from the same donor pool.²

1. Lam FC, Bruinsma M, Melles GRJ. Descemet membrane endothelial transfer. *Curr Opin Ophthalmol.* 2014;25:353-7.

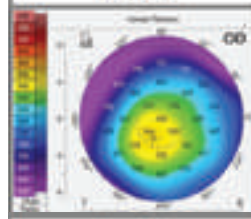
2. Lam FC, Baydoun L, Dirisamer M, Lie JT, Dapena I, Melles GRJ. Hemi-DMEK transplantation - A potential method for increasing the pool of endothelial graft tissue. *JAMA Ophthalmol.* 2014;132:1469-73.



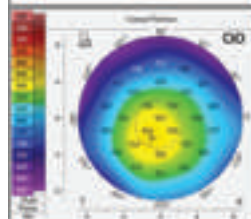
Month 1



Month 3

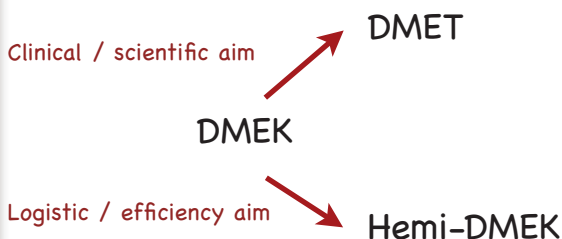


Month 6



Slit-lamp and topography images of an eye after Hemi-DMEK (arrows)

Free floating graft that would be effective through a different wound healing concept, i.e. by activation of peripheral recipient endothelial cells that may not be 'dystrophic' in Fuchs endothelial dystrophy



'Same' surgical technique with an equally large but differently shaped tissue, potentially doubling the yield of endothelial transplants from the same donor

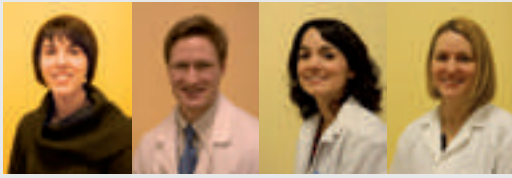
Please note our NIIOS LinkedIn profile, with information on publications and upcoming meetings

NETHERLANDS INSTITUTE FOR INNOVATIVE OCULAR SURGERY



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Cornea & Research fellows 2014-2015



Left-to-right: Maria Satué, Spain; Jack Parker, USA; Ester Fernandez, Spain; Nadine Gerber, Switzerland

NIOS scientific articles 2014-2015

2015

- ♦ Fernandez Lopez E, Lam FC, Bruinsma M, Baydoun L, Dapena I, Melles GRJ. Fuchs endothelial dystrophy: current treatment recommendations and new experimental surgical options. *Exp Rev Ophthalmol*. Accepted.
- ♦ Parker JS, van Dijk K, Melles GRJ. Treatment options for advanced keratoconus: A review. *Surv Ophthalmol*. Accepted.
- ♦ MonnerEAU C, Dapena I, Melles GRJ. Reply to Descemet's membrane endothelial keratoplasty (DMEK): To do or not to do? *JAMA Ophthalmol*. Accepted.
- ♦ Satue M, Rodríguez-Galvo-de-Mora M, Naveiras M, Cabrerizo J, Dapena I, Melles GRJ. La estandarización en el trasplante endotelial de membrana de Descemet (DMEK): Resultados de las primeras 450 cirugías (Technique standardization for Descemet membrane endothelial transplant (DMEK): outcomes from the first 450 consecutive surgeries). *Arch Soc Esp Oftalmol*. Accepted.
- ♦ Parker J, Konder R, van Dijk K, Melles GRJ. Toward safer treatment options for advanced keratoconus. *US Ophthalmic Review* 2015;8:33-4.
- ♦ Baydoun L, van Dijk K, Dapena I, Musa FU, Liarakos VS, Ham L, Melles GRJ. Repeat Descemet membrane endothelial keratoplasty after complicated primary Descemet membrane endothelial keratoplasty. *Ophthalmology* 2015;122:8-16.
- ♦ Lie JT, MonnerEAU C, Groeneveld-van Beek EA, van der Wees J, Frank J, Bruinsma M, Melles GRJ. Dehydration of corneal anterior donor tissue with polyethylene glycol (PEG)-enriched media. *Cell Tissue Bank*. Accepted.
- ♦ Rodríguez-Galvo-de-Mora M, QuilendrinO R, Ham L, Liarakos VS, van Dijk K, Baydoun L, Dapena I, Oellerich S, Melles GRJ. Clinical outcome of 500 consecutive cases undergoing Descemet membrane endothelial keratoplasty. *Ophthalmology*. 2015;122:464-70.
- ♦ Konder R, Baydoun L, Dirisamer M, Ciechanowski P, Oellerich S, Melles GRJ. Descemet Membran Endothelkeratoplastik (DMEK) und/oder Phakoemulsifikation in phaken Augen mit Hornhautendotheldystrophie. *Spektrum Augenheilkd*. Accepted.
- ♦ van Dijk K, Liarakos VS, Parker J, Ham L, Lie JT, Groeneveld-van Beek EA, Melles GRJ. Bowman layer transplantation to reduce and stabilize progressive, advanced keratoconus. *Ophthalmology*. Accepted.

2014

- ♦ van Dijk K, Baydoun L, Konder R, Melles GRJ. Contact lenses after keratoplasty. *Contact Lens Spectrum*. 2014;Aug:36-42.
- ♦ van Dijk K, van Esch H, Bruinsma M, Groeneveld-van Beek E, Melles GRJ. Dua's layer: Anatomie van de cornea opnieuw gedefinieerd? *Visus* 2014;2:22-4.
- ♦ Lam FC, Baydoun L, Dirisamer M, Lie JT, Dapena I, Melles GRJ. Hemi-DMEK transplantation – A potential method for increasing the pool of endothelial graft tissue. *JAMA Ophthalmology*. Accepted.
- ♦ Cabrerizo J, Livny E, Musa FU, Leeuwenburgh P, van Dijk K, Melles GRJ. Changes in color vision and contrast sensitivity after Descemet membrane endothelial keratoplasty for Fuchs endothelial dystrophy. *Cornea* 2014;33:1010-5.
- ♦ Baydoun L, Liarakos VS, Dapena I, Melles GRJ. Reply to Coster et al.: A comparison of lamellar and penetrating keratoplasty outcomes. *Ophthalmology*. 2014;121:e61-2
- ♦ MonnerEAU C, Bruinsma M, Ham L, Baydoun L, Oellerich S, Melles GRJ. Endothelial cell changes as an indicator for upcoming allograft rejection following Descemet membrane endothelial keratoplasty. *Am J Ophthalmol* 2014;158:485-95.
- ♦ Salouti R, Nowroozzadeh MH, Makateb P, Zamani M, Ghoreyshy M, Melles GRJ. Deep anterior lamellar keratoplasty for keratectasia after laser in situ keratomileusis. *J Cataract Refract Surg*. 2014;40:2011-8.
- ♦ van Dijk K, Droutsas K, Hou J, Sangsari S, Liarakos VS, Melles GRJ. Optical quality of the cornea after Descemet membrane endothelial keratoplasty. *Am J Ophthalmol*. 2014;158:71-9.
- ♦ Livny E, Parker JS, van der Kaaij M, Haasdijk ED, van der Wees J, Bruinsma M, Melles GRJ. Post-mortem ultra-structural analysis of a cornea transplanted with Descemet membrane endothelial keratoplasty (DMEK). *Cornea* 2014;33:790-4.
- ♦ van Esch HCM, Leeuwenburgh PE, van Dijk K, Melles GRJ. Amnionmembraan transplantatie bij recidiverende erosie: twee casussen. *VISUS* 2014;1:9-13.
- ♦ Lam FC, Bruinsma M, Melles GRJ. Descemet membrane endothelial transfer. *Curr Opin Ophthalmol*. 2014;25:353-7.
- ♦ MonnerEAU C, QuilendrinO R, Dapena I, Liarakos VS, Alfonso JE, Arnalich-Montiel F, Böhne M, Pereira NC, Dirisamer M, Parker J, Droutsas K, Geerling G, Gerten G, Hashemi H, Kobayashi A, Naveiras M, Oganesyan O, Orduña Domingo E, Priglinger S, Stodulka P, Torrano Silva J jr, Venzano D, Vetter JM, Yiu E, Melles GRJ. Multicenter study on Descemet membrane endothelial keratoplasty: First case series of 18 surgeons. *JAMA Ophthalmology*. 2014;132:1192-8.
- ♦ Veckeneer M, Mohr A, Alharthi E, Azad R, Bashshur ZF, Bertelli E, Bejjani RA, Bouassida B, Bourla D, Corcóstegui Crespo I, Fahed C, Fayyad F, Mura M, Nawrocki J, Rivett K, Scharioth GB, Shkvorchenko DO, Szurman P, van Wijck H, Wong IY, Wong DSH, Frank J, Oellerich S, Bruinsma M, Melles GRJ. Novel 'heavy' dyes for retinal membrane staining during macular surgery: Multicenter clinical assessment. *Acta Ophthalmol*. 2014;92:339-44.
- ♦ Droutsas K, Petrak M, Melles GRJ, Koutsandrea C, Georgalas I, Sekundo W. A simple ex vivo model for teaching Descemet membrane endothelial keratoplasty. *Acta Ophthalmol*. 2014;92:e362-5.
- ♦ Ciechanowski PP, Droutsas K, Baydoun L, Dirisamer M, Oellerich S, Melles GRJ. Standardisierte Descemet-Membran-Endothelkeratoplastik (DMEK) – Technik und aktuelle Ergebnisse. *Ophthalmologe* 2014;111:1041-9.
- ♦ van Dijk K, Parker J, Tong CM, Ham L, Lie J, Groeneveld-van Beek EA, Melles GRJ. Mid-stromal isolated Bowman layer graft to reduce advanced keratoconus to postpone penetrating or deep lamellar keratoplasty. *JAMA Ophthalmol* 2014;132:495-501.
- ♦ Melles GRJ. Reply to Fuchs fuchs Fuchs and Fuchs!. *EYE*. 2014;28:636.

NIOS staff writes textbook on 'standardized no-touch DMEK'

NIOS textbook on DMEK

Foreword
(P. Binder)

Preface
(G. Melles)

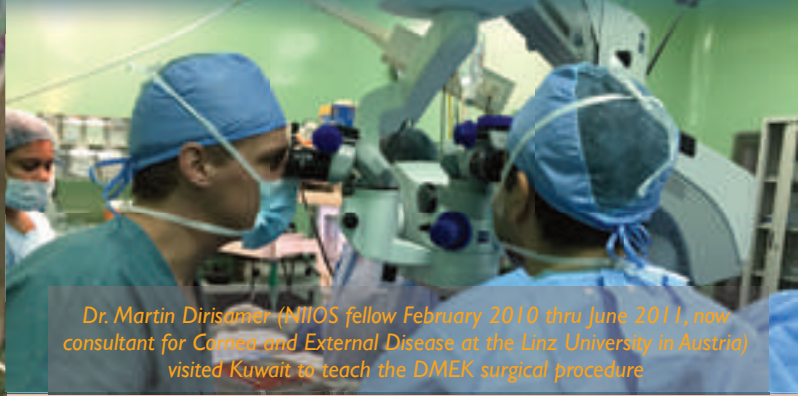
1. Introduction to endothelial keratoplasty
(I. Dapena, L. Ham)
2. Indications for DMEK surgery
(V. Liarakos, I. Dapena)
3. 'No-touch' donor tissue preparation for DMEK
(M. Bruinsma, E. Groeneveld-van Beek, J. Lie, K. Mangundap, J. van der Wees)
4. Surgical technique 'no-touch' DMEK
(I. Dapena, V. Liarakos, L. Baydoun, P. Ciechanowski, E. Livny, F.C. Lam)
5. Surgical considerations for challenging DMEK cases
(V. Liarakos, L. Baydoun, I. Dapena)
6. Novel DMEK surgeons' outcomes and complications
(K. Droutsas, C. MonnerEAU, M. Naveiras, C. Balachandran, J. Cabrerizo, M. Dirisamer)
7. Diagnostic imaging techniques after DMEK
(S. Oellerich, L. Ham, V. Bourgonje, K. Moutsouris)
8. DMEK clinical outcomes
(K. van Dijk, L. Ham, H. van Esch, P. van Leeuwenburgh, M. Rodriguez, L. Baydoun)
9. DMEK complications
(J. Parker, R. QuilendrinO, R.Y.Yeh, M. Naveiras, M. Dirisamer)
10. DMEK and crystalline lens considerations
(L. Baydoun, F. Musa, J. Parker)
11. Clinical approach to future therapies for endothelial disease
(I. Dapena, M. Bruinsma, F.C. Lam)
12. Clinical cases
(C. MonnerEAU, L. Ham, V. Bourgonje, M. Satué, C.M. Tong, I. Dapena)
13. Frequently asked questions
(M. Rodriguez, P. Ciechanowski, A. Miron)
14. Wetlab courses and NIOS
(S. Oellerich, C. de Kort, K. Herders)
15. Patients' personal experiences with DMEK
(C. de Kort, V. Bourgonje)

& DVDs displaying tissue preparation techniques





Dr Javier Cabrerizo (NIIOS fellow May thru November 2012, now consultant for Cornea and External Disease at the University Hospital in Vitoria, Spain) performing DMEK in his own operating theatre



Dr. Martin Dirisamer (NIIOS fellow February 2010 thru June 2011, now consultant for Cornea and External Disease at the Linz University in Austria) visited Kuwait to teach the DMEK surgical procedure

Ex-NIIOS-fellows start succesfully with DMEK while teaching colleagues
NIIOS fellows are spreading DMEK

Since 2005, NIIOS has been offering ‘corneal fellowships’ for young ophthalmologists who just completed their residency in Ophthalmology and ‘research fellowships’ for medical students and medical biologists. During the corneal fellowship, all doctors participate in patient consultations and various types of corneal transplantation surgeries, with the main focus on treatment of Fuchs dystrophy and keratoconus.

After 10 years of having corneal fellows at the institute, we evaluated the efficacy of the fellowship by listing the number of fellows who are now working as a corneal surgeon and/or started themselves with advanced corneal transplant procedures: All but one, 19/20 (95%), of the former fellows pursued a career as a corneal surgeon in in their native country, or became staff member at NIIOS. All of these 19 ex-fellows now perform tissue-sparing corneal transplantation (DSEK, DMEK, DALK, and/or Bowman layer transplants). Sufficient support at their ‘own’ hospital was a main factor for successfully implementing new NIIOS surgical techniques.

All fellows are a member of the NIIOS fellow alumni club.

DMEK tissue dissection service may save surgical time and ensure consistent DMEK-graft quality
'Outsourced' DMEK graft dissection

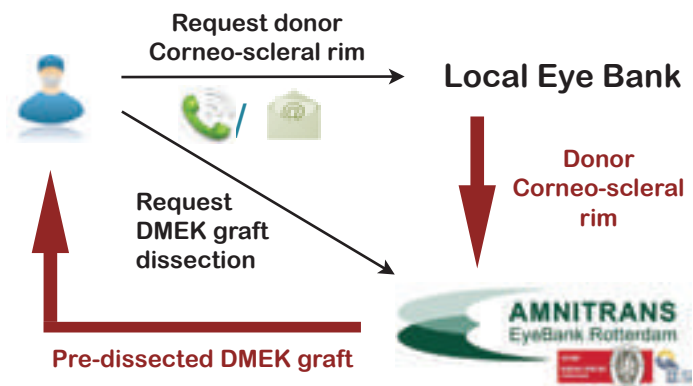
From all over the world, Amnitrans Eye Bank Rotterdam has been receiving an increasing number of requests for pre-dissected Descemet grafts for use in Descemet membrane endothelial keratoplasty (DMEK). Since the Netherlands is a rather small country, donor tissue availability is quite limited, so that not all requests can be fulfilled.

To overcome this problem, Amnitrans Eye Bank has set-up a service for DMEK graft dissection, using corneo-scleral rims provided by other eye banks, and preferably in the same country as the surgeon making the request. In other words, the surgeon asks the local eye bank for donor corneal tissue, but instead of sending it to the recipient hospital, a corneo-scleral rim is sent to Rotterdam for further surgical processing. At Amnitrans

Eye Bank, a donor Descemet-roll is then dissected from the donor cornea and stored in organ culture medium, after which the DMEK-graft is sent to the surgeon.

The use of pre-dissected DMEK-grafts may offer several advantages for corneal surgeons, for example:

- Although a donor Descemet membrane can be stripped off a donor cornea during surgery, preoperative tissue preparation may have the advantage that it does not require additional operation theatre time, and that it eliminates the risk of inadvertent preparation failure after which the procedure may have to be aborted.
- Preoperative tissue dissection allows for DMEK-grafts with consistent tissue quality, a documented endothelial cell count, and the advocated screening for microbiological contamination.
- For surgeons starting out with DMEK, the learning curve of the procedure may be shortened with pre-dissected DMEK-grafts.





Live-video streaming of DMEK surgeries performed in Rotterdam

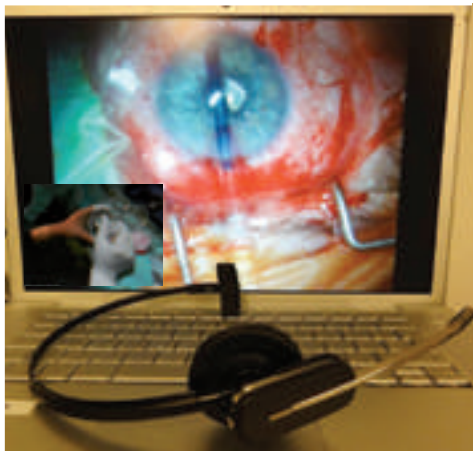
Descemet membrane endothelial keratoplasty (DMEK)

Sessions are scheduled on Thursdays from 9 am thru 4 pm (+1h Greenwich Time). Participants receive live images of the surgical microscope and side tables, and can chat (verbally or by typing) with the surgical staff during surgery.

Further information and applications: info@nios.com

- ☞ DMEK live-video stream: June 4, 2015
- ☞ DMEK live-video stream: Oct. 15, 2015
- ☞ DMEK live-video stream: Nov. 26, 2015

Level: Corneal fellows and surgeons



Interview with Dr. Nadine Gerber, NIOS fellow January thru November 2015
The potential royal life of a NIOS fellow

Nadine is a 35-year old ophthalmologist, who just finished her residency in Basel and passed the European Board examination in Paris. She originates from Lichtenstein in former Eastern Germany and she did her medical training in Aachen.

Being used to mountain areas from early childhood, Nadine chose to do her training in Ophthalmology in Basel, which provided just the right ambiance and crowd for a passionate ophthalmologist. Like the day she was invited by her future husband to go skiing with members of the English royal family. Although she certainly made an impression on Prince Charles and his entourage, the difference in speed going downhill separated her from most potential admirers, and the only one who followed her pace was her future husband, so she settled for him.

But Ophthalmology quickly proved relatively slow as well, so she turned to the subspecialty that holds the most potential for a fast track in research and clinical improvements: *Cornea*. Patients may already have met her during consultation hours and the rest of the world is probably soon to follow.

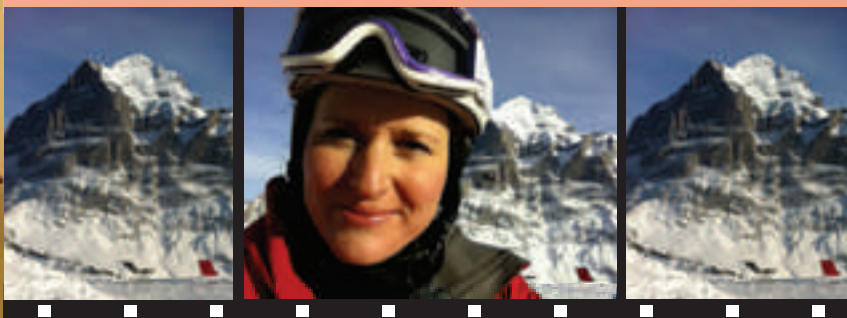
How did you get into contact with NIOS?

In Basel they recommended me to go to the Netherlands to further specialize at the most appropriate place for Cornea: Melles Cornea Clinic. My application to NIOS was then well received, and I was given a warm but "rainy" welcome. I was already familiar with the Netherlands. I have worked for a while with disabled children in Nijmegen and Amsterdam and went on holidays with them. At the moment I am following a Dutch course, but I was surprised that most patients here often seem to be fluent in English and German.

What is your goal for your stay here at NIOS?

Learning about the surgical options, the latest techniques for surgery as well as for the eye bank, and to participate in research projects that have clinical impact. My goal is to bring all the know how back home, and implement all techniques in our routine in the Ophthalmology Department at the University of Basel.

The photography team managed to get Dr. Nadine Gerber in full action using sequential photography, in which the NIOS fellow flies by the high speed camera at one of the slopes in her natural habitat, the Swiss Alps. Note how the background image gets slightly micromized by the refractile compressed air in front of the ophthalmic athlete's body.



Two-day advanced keratoplasty wetlab courses in Rotterdam

Descemet membrane endothelial keratoplasty (DMEK)

Each course is scheduled on a Tuesday/Wednesday. On Tuesdays, the course participants join live surgery sessions; on Wednesday, various techniques are practised during educational wetlab sessions and patient demonstrations.

Further information and applications: dekort@nios.com

- ☞ DMEK surgical course: June 2/3, 2015
- ☞ DMEK surgical course: Sept. 1/2, 2015 (before ESCRS)
- ☞ DMEK surgical course: Oct. 13/14, 2015
- ☞ DMEK surgical course: Nov. 24/25, 2015

Course level: Corneal fellows and surgeons

One-day advanced eye banking wetlab courses in Rotterdam

Tissue harvesting techniques for Descemet membrane endothelial keratoplasty (DMEK)

Each course is scheduled on a Friday. Various techniques are demonstrated and practised during educational wetlab sessions and changing eye bank logistics will be discussed.

Further information and applications: dekort@nios.com

- ☞ DMEK eye bank course: Sept. 11, 2015
- ☞ DMEK eye bank course: Nov. 20, 2015

Course level: Senior eye bank technicians