5th INTERNATIONAL CONFERENCE “LOW VISION AND THE BRAIN”
Rescue, Regeneration, Restoration and Rehabilitation

30 NOVEMBER–02 DECEMBER 2018 | BERLIN/GERMANY
The microcirculation of the retina is an excellent window to the heart and the brain. Retinal vessels offer the unique opportunity to be examined in vivo and non-invasively and to provide valuable information about the condition of the body’s microcirculation.

Imedos is using those characteristics of the ocular transparency to analyse retinal arteries and veins.

Our newly developed device, the IOPstim, provides the special opportunity of measuring retinal venous pressure (RVP), which holds a particular meaning in the vascular aspects of glaucoma.

The Dynamic Vessel Analysis performs functional diagnostics in order to assess the retinal autoregulation, playing an important role in vascular eye diseases like glaucoma and diabetic retinopathy.

The Static Vessel Analysis clarifies the status of the microcirculation by using a very well validated method of measuring the AV-ratio, which serves as an important bio-marker in screening, such as the risk of hypertension and cardiovascular events.

Large-scale cohort studies could prove the relevance and clinical use of the biomarkers gained from Retinal Vessel Analysis. We are convinced of the immense prospects for optimising screening and therapy guidance in chronic vascular diseases of the retina and other organs.
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ORGANISATION AND IMPRINT

Venue
Kaiserin-Friedrich-Haus
Robert-Koch-Platz 7 | 10115 Berlin/DE

Conference website
www.4r-vision.com

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Bernhard A. Sabel, PhD (Magdeburg/DE)
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Medical Faculty | Institute of Medical Psychology

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Conference organisation
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Design and layout
Layout krea.tif-art UG (haftungsbeschränkt)
Print Junggebauer Medien GmbH
Circulation 100
Editorial deadline 19 November 2018
Dear colleagues,

Welcome to Berlin, the city of art, culture and science. This is the city where Hermann von Helmholtz – founder of psychophysics – and Alexander von Humboldt – the father of empirical science – were known for their visionary contributions on exploring the human mind and the laws of nature. In their spirit, this conference explores the topic of vision loss after damage to the retina, optic nerve or brain. Such neurodegenerations are generally considered irreversible, wherein the best practice is currently to slowing decline through eye drops or surgery.

The retina, optic nerve and visual cortex present very particular challenges in clinical management as so many patients are left with permanent visual loss as a result of late presentation or a lack of universally effective treatments. But progress in science and technology gives rise towards a more optimistic future of prevention, compensation and even improvement/restoration of low vision.

These advances impact different visual system diseases affecting the nervous system, including typical “eye diseases” such as glaucoma, optic neuropathy, diabetic retinopathy, macular degeneration, retinitis pigmentosa and ambylopia. But low vision is also found in neurological diseases of the brain’s visual system including stroke and trauma, normal aging, dementia, PCA, Huntington’s, Parkinson’s and other diseases.

“4r-vision” is an international and multidisciplinary conference that will highlight basic science, diagnostic and treatment approaches that aim to modulate nervous system structure and function through rescue, regeneration, restoration and rehabilitation.

Besides the retina – with its 1 gram of tissue weight – the brain’s visual system (>100 gr) is also a potential target to offer new research and therapy opportunities which might greatly impact patient care in the future. This conference will showcase recent paradigm shifts in basic science, clinical care, and industry innovations, including drugs and devices that can reduce cell death, stem cells and regeneration, behavioural training and electrical devices (prosthesis and non-invasive brain stimulation) that strengthen residual visual capacities through brain plasticity and restore some vision. In addition, psychological topics will be discussed, such as the role of stress and coping difficulties in low vision, substitution and compensation.
4r-vision is unique as it addresses the eye-brain interaction in an interdisciplinary manner, touching the fields of ophthalmology, neurology, neuropsychology, rehabilitation medicine, engineering, pharmacology and technology. 4r-vision will present next steps to brighten the light at the end of the tunnel of blindness, highlighting innovative methods that might provide more wiggle room to reduce or prevent vision loss and improve it. The conference is an interdisciplinary hub for exchanging scientific advances, innovation and ideas for commercialization, to tackle this major unsolved problem in medicine.

I look forward to welcoming scientists and clinicians from all over the world to participate in the exciting atmosphere of 4r-vision conference in this city of art, culture, and science.

Bernhard A. Sabel, PhD
Cutting-edge advancements from around the world

Ophthalmology Times Europe

Print, digital and mobile
OTEurope.com
## PROGRAMME OVERVIEW

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### Key
- **Registration**
- **Session**
- **Poster session**
12:00–12:20  Welcome  
12:00  Eye, brain + Co  
Bernhard A. Sabel (Magdeburg/DE)

12:20–13:05  Session 1 – Part I  
Eye, Brain & Co – Normal and abnormal  
Chairs  
Bernhard A. Sabel (Magdeburg/DE)

12:20  Definition and assessment of low vision  
O-01  Lea Hyvarinen (Helsinki/FI)

12:35  The effect of colour perception in the brain in low vision  
O-02  Kazim Hilmi Or (Istanbul/TR)

12:50  Diffusion tensor quantification of optic pathways in primary open angle glaucoma (POAG) – preliminary study  
O-03  Alina Piekarek (Wrocław/PL)

13:05–14:00  Coffee break and industrial exhibition

14:00–15:00  Session 1 – Part II  
Eye, Brain & Co – Normal and abnormal  
Chairs  
Bernhard A. Sabel (Magdeburg/DE)

14:00  Cortical correlations of the ocular functional asymmetry in visual attentional orienting  
O-04  Sinan Liu (Suzhou/CN)

14:15  Pulsed electrical stimulation of the human eye enhances retinal vessel reaction to flickering light  
O-05  Stefanie Freitag (Ilmenau/DE)

14:30  Neuronal mechanisms in the choroidal, retinal and episcleral circulation  
O-06  Clemens Strohmaier (Salzburg/AT)

14:45  Retinal vascular biomarkers and glaucoma  
O-07  Walthard Vilser (Jena/DE)

15:00–15:45  Coffee break and industrial exhibition
## SCIENTIFIC PROGRAMME I FRIDAY, 30 NOVEMBER

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<td>15:45–17:05</td>
<td>Special Symposium Regeneration and Rescue I</td>
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<tr>
<td>Chairs</td>
<td>Larry Benowitz (Boston, MA/US), Jeffrey L. Goldberg (Palo Alto, CA/US)</td>
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<tr>
<td>15:45</td>
<td>RGC survival and axon regeneration are regulated by multiple cell types after optic nerve injury</td>
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<td>O-08</td>
<td>Larry Benowitz (Boston, MA/US)</td>
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<td>16:05</td>
<td>Generating and regenerating cone photoreceptors</td>
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<td>O-09</td>
<td>Michel Cayouette (Montréal/CA)</td>
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<td>16:25</td>
<td>Regeneration mediated by endogenous neural stem cells</td>
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<td>O-10</td>
<td>Maria Adele Rueger (Cologne/DE)</td>
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<td>16:45</td>
<td>Neuronal intrinsic mechanisms regulating optic nerve regeneration</td>
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<td>O-11</td>
<td>Kai Liu (Hong Kong/CN)</td>
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<td>17:05–17:30</td>
<td>Coffee break and industrial exhibition</td>
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<td>17:30</td>
<td>Characterization of PTEN/mTOR/akt/non-akt signalings in CNS Axon Regeneration</td>
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<td>O-12</td>
<td>Yang Hu (Palo Alto, CA/US)</td>
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<td>17:45</td>
<td>Insulin signaling promotes dendrite and synapse regeneration and restores circuit function after axonal injury</td>
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<td>O-13</td>
<td>Adriana Di Polo (Montréal/CA)</td>
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<td>18:05</td>
<td>Retinal ganglion cell regeneration, bench to clinic</td>
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<td>O-14</td>
<td>Jeffrey L. Goldberg (Palo Alto, CA/US)</td>
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<td>18:25</td>
<td>Discussion</td>
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<td>18:30–21:00</td>
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09:00–10:00  Session 3 – Part I
Brain reorganization & neuroplasticity
Chairs  Amir Amedi (Jerusalem/IL), Arash Sahraie (Aberdeen/GB)

09:00  Language recruitment of the congenitally deprived visual cortex and subcortical regions is parametrically modulated by linguistic load
Benedetta Heimler (Jerusalem/IL)

09:15  The sound of the scotoma – audio space representation reorganization in individuals with macular degeneration
Hafsah Ahmad (Genova/IT)

09:30  Brain functional connectivity remodeling in patients with optic nerve damage – an evoked response network analysis
Zheng Wu (Magdeburg/DE)

09:45  Brain plasticity underlying sight deprivation and restoration
Olivier Collignon (Louvain/BE)

10:00–10:30  Coffee break and industrial exhibition

10:30–11:45  Session 3 – Part II
Brain reorganization & neuroplasticity
Chairs  Amir Amedi (Jerusalem/IL), Arash Sahraie (Aberdeen/GB)

10:30  Functional recovery after cataract surgery
Brigitte Röder (Hamburg/DE)

10:45  Impaired functional and anatomic interhemispheric homotopic connectivity in POAG
Ailian Hu (Beijing/CN)

11:00  Development of a cortical visual neuroprosthesis for the blind
Eduardo Fernandez (Elche/ES)

11:15  Brain electric current stimulation of the visual system
Andrea Antal (Göttingen/DE)

11:30  Preliminary results of subjects with glaucoma treated with transorbital alternating current stimulation
Heather Livengood (New York, NY/US)
SCIENTIFIC PROGRAMME I SATURDAY, 01 DECEMBER

11:45–12:30  Lunch break and industrial exhibition

12:30–14:15  Session 4
Visual Rehabilitation & Substitution
Chairs  Brigitte Röder (Hamburg/DE), Olivier Collignon (Louvain/BE)

12:30  The mapping of the brain’s mind eye in the absence of visual experience:
O-24  a population receptive field mapping of the soundscape space
Amir Amedi (Jerusalem/IL)

12:45  Hearing the visual rhythm and seeing the audio space – early cortical
O-25  sensory responses in typical but not in blind and deaf individuals.
Monica Gori (Genova/IT)

13:00  Vision rehabilitation in hemianopia – efficacy of a compensatory
O-26  approach
Arash Sahraie (Aberdeen/GB)

13:15  Rapid improvement of reading performance in children with dyslexia by
O-27  altering the reading strategy
Reinhard Werth (Munich/DE)

13:30  Assessment and training of visual functions in government schools in
O-28  Tanzania, Africa
Marion Felder (Koblenz/DE)

13:45  Artificial scotomas, attention and eye movements – insights into
O-29  rehabilitation strategies for central vision loss
Arlenne Khan (Montréal/CA)

14:00  Low vision services in Italy
O-30  Paolo Limoli (Milano/IT)

14:15–14:45  Coffee break and industrial exhibition
14:45–16:20  **Session 5**  
**Special symposium Regeneration and Rescue II**  
**Chairs**  
Larry Benowitz (Boston, MA/US), Jeffrey L. Goldberg (Palo Alto, CA/US)

14:45  
**POU6F2, a potential risk of developing glaucoma**  
Eldon Geisert (Irvine, CA/US)

15:05  
**Identification of kinase pathways involved in RGC cell death**  
Derek Welsbie (San Diego, CA/US)

15:25  
**Voluntary running delays primary degeneration in rat retinas after partial optic nerve transection**  
Kwok-Fai So (Hong Kong/CN)

15:45  
**Neurotoxic reactive astrocytes in acute and chronic eye injuries**  
Shane Liddelow (New York, NY/US)

16:05  
**Neuroprotection in the rodent retina**  
Manuel Vidal-Sanz (Murcia/ES)

**16:20–17:20 Poster session II**  
(see page 15)

**17:20–18:20 Visions for research and funding**  
**Chair**  
Bernhard A. Sabel (Magdeburg/DE)

17:20  
**The National Eye Institute – funding programs and policies**  
Cheri Wiggs (Bethesda, MD/US)

17:40  
**Catalyst for a cure – a unique collaborative research approach to cure glaucoma**  
Jeffrey L. Goldberg (Palo Alto, CA/US)

18:00  
**Discussion**
09:15–10:15 Session 6 – Part I
Technology & Out-of-the-Box Approaches
Chairs Andrea Antal (Göttingen/DE), Kwok-Fai So (Hong Kong/CN)

09:15 Microsaccade function and abnormalities in low vision
O-39 Ying Gao (Magdeburg/DE)

09:30 Mental stress – Possible cause of vision loss and a hurdle for vision restoration?
O-40 Bernhard A. Sabel (Magdeburg/DE)

09:45 Special lecture
Vision restoration therapies – translational challenges
O-41 Jose Sahel (Paris/FR)

10:15–10:35 Coffee break and industrial exhibition

10:35–12:05 Session 6 – Part II
Technology & Out-of-the-Box Approaches
Chairs Andrea Antal (Göttingen/DE), Kwok-Fai So (Hong Kong/CN)

10:35 Visual evoked potentials in surgery of tumors affecting the chiasma or optical tract
O-42 Mihail Manu (Cologne/DE)

10:50 A newly developed multisensory serious game improves mathematical and geometrical competence in primary school children
O-43 Guilia Cappagli (Genova/IT)

11:05 Quantitative pupillometry as an addition tool to clinically assess patients with acute brain trauma and intracranial pressure recording
O-44 Alexander E. L. Hartmann (Cologne/DE)

11:20 Towards neuroadaptive technology – an outlook on the potential impact of passive brain-computer interfaces on human visual processing
O-45 Thorsten Zander (Berlin/DE)

11:35 General discussion and closing remarks
Bernhard A. Sabel (Magdeburg/DE)

12:00 End of the meeting
POSTER PRESENTATIONS

**Augmentation/Substitution/Compensation**

P-01  The role of posture in reference frame selection with no visual inputs
     Or Yizhar (Jerusalem/IL)

P-02  4 questions – Is(n’t) it possible (not) to perceive scotomas?
     Kazim Hilmi Or (Istanbul/TR)

**Brain reorganization and neuroplasticity**

P-03  Brain network reorganization and compensation at occipital with homonymous
     hemianopia patients
     Jack Xu (Magdeburg/DE)

P-04  Color processing in human visual cortex
     Andriani Rina (Boston, MA/US)

P-05  Motor actions elicit negative BOLD responses in the blind
     Or Yizhar (Jerusalem/IL)

**Neurotechnology and drugs**

P-06  In vivo imaging of blood-retina barrier passage of moiety labelled polymeric
     nanoparticles
     Mohamed Tawfik (Magdeburg/DE)

P-07  Major effects on blood-retina barrier passage by minor alterations in design of
     polybutylcyanoacrylate nanoparticles
     Qing You (Magdeburg/DE)

P-08  In vivo visualization different kinetic of active compound encapsulated in PLGA
     nanoparticles at the blood-retinal barrier
     Enqi Zhang (Magdeburg/DE)

**Regeneration and Rescue**

P-09  Our case present possible risk factors and therapy for age-related wet macular
     degeneration (ARMD)
     Satar Baghrizabehi (Maribor/SI)

P-10  Effect of refraction errors on pupil response on local stimuli
     Hanna Faber (Tübingen/DE)

P-11  Cell surgery in retinitis pigmentosa – prognostic role of optical coherence tomography
     Paolo Limoli (Milano/IT)
POSTER PRESENTATIONS

Restoration and recovery
P-12 Inhibition of mTOR pathway to prevent photoreceptor cell damage
Umur Kayabasi (Istanbul/TR)

P-13 Lycium Barbarum (Wolfberry) delayed secondary degeneration of retinal ganglion cells via modulating the polarization of microglia/macrophages and autophagy
Hong-Ying Li (Guangzhou/CN)

P-14 A case of hyaluronic acid induced blindness with ophthalmoplegia and ptosis
Huan Wang (Chengdu/CN)

P-15 Mental stress can cause vision loss and limit vision recovery after optic nerve damage
Jiaqi Wang (Magdeburg/DE)

Visual rehabilitation and neuropsychological interventions
P-16 Dissociation of ventral and dorsal stream contribution to interaction with objects in a patient with a profound occipital lesion
Kirstin Lederer (Aachen/DE)

P-17 Developing a rational strategy for visual rehabilitation after cortical lesions
Andriani Rina (Boston, MA/US)

P-18 Cortex oscillations could differentiate the gradient of the central visual field defect
Chaoqun Shi (Suzhou/CN)

P-19 Computerized reading rehabilitation for patients with central scotoma – first results
Murat Erbezci (Izmir/TR)
6th INTERNATIONAL CONFERENCE “LOW VISION AND THE BRAIN”
Rescue, Regeneration, Restoration and Rehabilitation

22–24 NOVEMBER 2019 I BERLIN/GERMANY

www.4r-vision.com
Chair: Bernhard A. Sabel, PhD (Magdeburg/DE)
GENERAL INFORMATION

Registration
Congress registration fees (incl. welcome reception)
On-site fee (from 30 November):
• Regular  350 EUR
• Students   180 EUR
• Industry  600 EUR

GTC
General terms and conditions at www.4r-vision.com.

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A cloakroom is located next to the check-in desk. The organising agency assumes no liability outside the opening hours.
Fee: 1 EUR per garment or piece of luggage

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Poster session
You can find your permanent programme ID in the programme part of this book. Every poster wall is marked with a permanent programme ID, so that authors can find their place within the poster exhibition. All poster authors are asked to hang up their posters on Friday, 30 November from 13:00 and remove them on Sunday, 02 December until 11:00. Mounting materials will be provided on each poster board. Please do not use any other type of pins than those provided.

The poster exhibition will be take place during the whole workshop, special times for visiting the exhibition are:

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<td>Friday, 30 November</td>
<td>18:30–21:00</td>
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<td>Poster session II</td>
<td>Saturday, 01 December</td>
<td>16:20–17:20</td>
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**Welcome reception**

We would like to invite you to join the welcome reception and to spend a nice evening with your colleagues in a relaxed atmosphere; refreshing beverages and finger-food will be served.

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