



Working Group

**Retinal Microvascular Research (REtina-SEARCH)**

**Newsletter (2023/1)**

January 10<sup>th</sup>, 2023

**Dear Members,**

The last two years were mainly influenced by the COVID 19 pandemic. Fortunately, the scientific world is recovering from the pandemic. This year the conference of the European Society for Microcirculation will be realized on site. We will use this conference to meet again in person in Aarhus (Denmark) at 23-27 of April. The abstract submission is still open till 15<sup>th</sup> January. We would be happy to meet most of you in Aarhus.

We would like to give you a brief update on our working group and would like to highlight some developments and publications in this newsletter.

Very important for our working group was the publication of the first [normative data](#) for static and dynamic retinal vessel analysis last year. Please contact the authors if you are interested in using these data. In addition, Henner Hanssen was invited to write an extensive review on retinal vessel diameters and function in cardiovascular risk and disease for *Progress in retinal and eye research*. Please find these publications and further publication highlights below.

**Upcoming meeting**

ESM conference in Aarhus (Denmark) 23.-27 April.

conference webpage: <https://conferences.au.dk/esm>

Abstract submission deadline: 15<sup>th</sup> January 2023

Especially for the young community: travel awards are available

Session highlights: Microcirculation of the eye with Jo DeMey (Chair), Henner Hanssen (Speaker), Boy Houben (Speaker), Toke Bek (Speaker)

## Technical developments

Since a few years it is possible to conduct the static retinal vessel analysis in mouse models. It was very difficult to take images with a high image quality and resolution at the beginning. Therefore, the working group of the University of Basel did some experiments to improve the image quality. They used fluorescein to improve inter- and intraobserver variability. Standardization for time of image acquisition after fluorescein injection is advisable due to an early dynamic phase of vessel diameters after the injection.

Some working groups developed systems to quantify retinal vessel diameters fully automated (e.g. using artificial intelligence). The observer independence as well as the higher standardization of these developments are gratifying. However, the comparability to the semi-automated method as well as the reclassification rate, associations to cardiovascular risk factors, or the ability to monitor treatment have to be investigated for these new systems. Work in progress.

## Scientific Review

Most recent publications (in alphabetical order of first authors): *please do send your recommendations for publications to share to [lukas.streese@hs-niederrhein.de](mailto:lukas.streese@hs-niederrhein.de).*

-A deep-learning system for the assessment of cardiovascular disease risk via the measurement of retinal-vessel calibre (Cheung)

-Retinal biomarkers for Alzheimer's disease and vascular cognitive impairment and dementia (VCID): implication for early diagnosis and prognosis (Czakó)

-Retinal microvascular function is associated with the cerebral microcirculation as determined by intravoxel incoherent motion MRI. (van Dinther)

-Extracerebral microvascular dysfunction is related to brain MRI markers of cerebral small vessel disease: The Maastricht Study. (van Dinther)

-Association of Markers of Microvascular Dysfunction With Prevalent and Incident Depressive Symptoms: The Maastricht Study. (Geraets)

-Carotid stiffness is associated with retinal microvascular dysfunction- The Maastricht Study. (Heide)

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-Retinal vessel diameters and function in cardiovascular risk and disease (Hanssen)

-Fasting and post-oral-glucose-load levels of methylglyoxal are associated with microvascular, but not macrovascular, disease in individuals with and without (pre)diabetes: The Maastricht Study (Hanssen)

- Habitual intake of dietary advanced glycation end products is not associated with generalized microvascular function-the Maastricht Study (Linkens)
- Habitual intake of dietary methylglyoxal is associated with less low-grade inflammation: the Maastricht Study. (Maasen)
- Delayed retinal vein recovery responses indicate both non-adaptation to stress as well as increased risk for stroke: the SABPA study (Malan)
- Retinal-glia ischemia and inflammation induced by chronic stress: The SABPA study (Malan)
- A Stress Syndrome Prototype Reflects Type 3 Diabetes and Ischemic Stroke Risk: The SABPA Study (Malan)
- Denser Retinal Microvascular Network Is Inversely Associated With Behavioral Outcomes and Sustained Attention in Children (Provost)
- Sex differences in the association of prediabetes and type 2 diabetes with microvascular complications and function: The Maastricht Study. (de Ritter)
- Normative data and standard operating procedures for static and dynamic retinal vessel analysis as biomarker for cardiovascular risk (Streese)
- Lipoprotein Subclasses Independently Contribute to Subclinical Variance of Microvascular and Macrovascular Health (Streese)
- In-vivo assessment of retinal vessel diameters and observer variability in mice: A methodological approach (Streese)
- Mortality prediction of retinal vessel diameters and function in a long-term follow-up of haemodialysis patients (Streese)
- Microvascular endothelial dysfunction in heart failure patients: An indication for exercise treatment? (Streese)
- Systemic hypertension associated retinal microvascular changes can be detected with optical coherence tomography angiography (Sun)

**Season`s Greetings and a Happy New Year to all of you.**

Stay healthy and keep in touch!

Best wishes,

**Boy Houben**

*chair*

**Henner Hanssen**

*chair-elect*

**Lukas Streese**

*young community & social media*