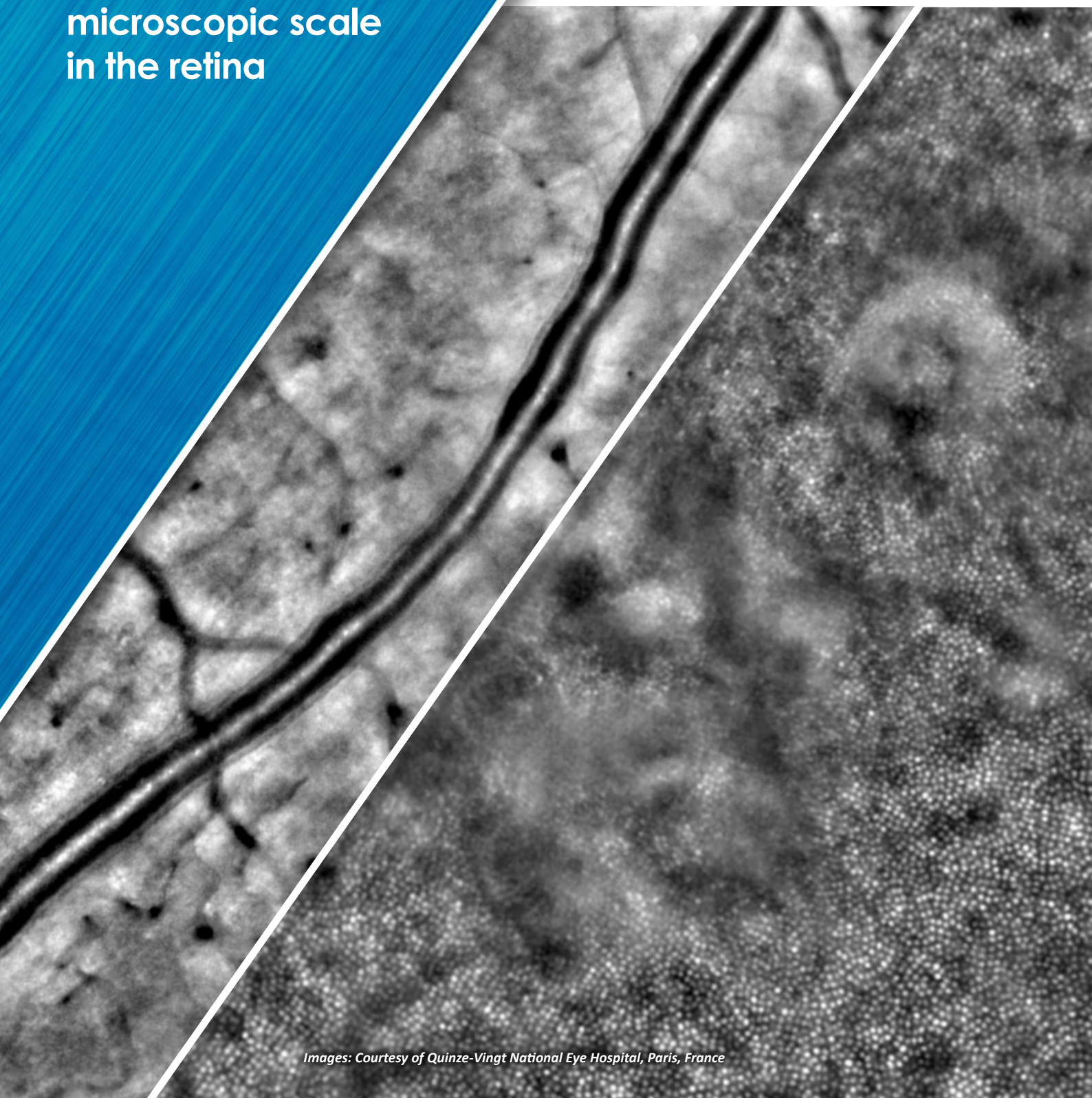
rtx1™-e

Adaptive optics retinal camera

imagine eyes®

Track diseases at the microscopic scale in the retina



Images: Courtesy of Quinze-Vingt National Eye Hospital, Paris, France

rtx1™-e

Adaptive optics retinal camera

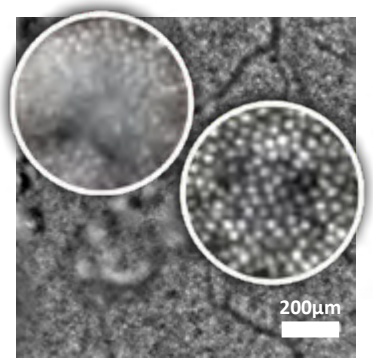
See the retina beyond current limits

The rtx1 is an infrared retinal camera that offers a lateral resolution at least 10 times higher than OCT and other conventional imaging devices.

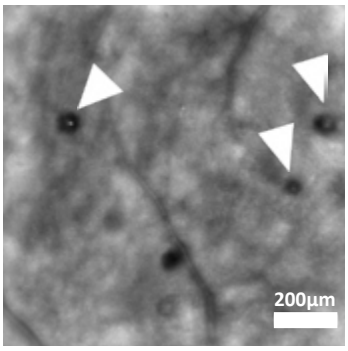
With the rtx1, you can examine the retina at a scale where single cells are visible.

rtx1 images reveal retinal details that remain invisible with other techniques :

- Parafoveal photoreceptor cones
- Wall structure of arterioles
- Micro-aneurisms and micro-hemorrhages and other small lesions



Familial drusen[1]
Small drusen are revealed by changes in the cone cell mosaic



Diabetic retinopathy[1]
Micro-aneurisms are visible without injecting fluorescein

> *In all patients, AO images showed dark elements that were smaller than what could be resolved by fundus imaging and OCT*
>
> Bek. *Acta Ophthalmologica 92*, 753–758.

Clinician-friendly adaptive optics

The time when AO technology could be mastered only by physicists and engineers belongs to the past.

Designed in collaboration with clinicians, the rtx1 unites ultra-high resolution images, patient throughput and usability.

2s

Acquisition time

Cellular resolution imaging comfortable for the patient

30s

Follow-up procedure

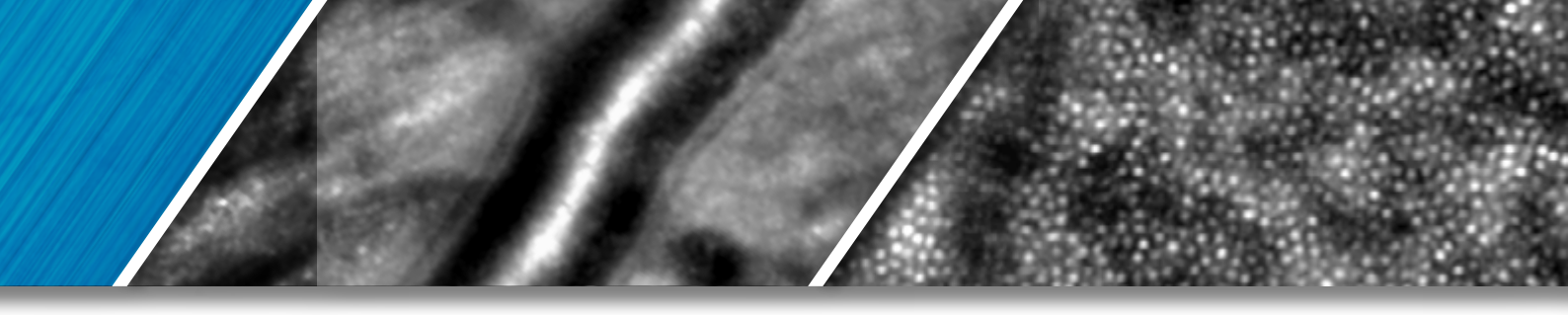
Automatic image alignment for tracking disease progressions and regressions at the cellular scale

Ready for 1000-patient studies

Large studies already published, multicentric studies underway

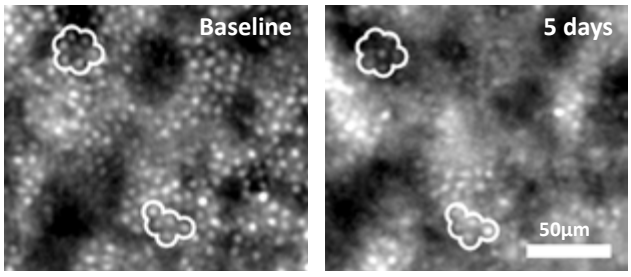
> *The rtx1 demonstrates that, unlike the common belief, performing AO retinal imaging can be as easy as standard retinal imaging.*
>
> Pr. Paques, Quinze-Vingt National Hospital, Paris, France, 2018.

[1] Courtesy of Quinze-Vingt National Eye Hospital, Paris, France

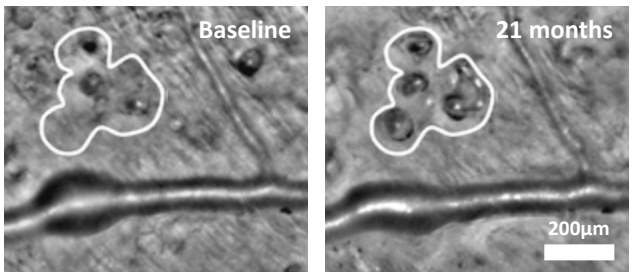


Track microscopic retinal changes

By design, the rtx1 delivers images that are free from motion distortion. Building on this advantage, its software enables capturing images of the same retinal region through different visits, and automatically aligns them with micrometer accuracy.



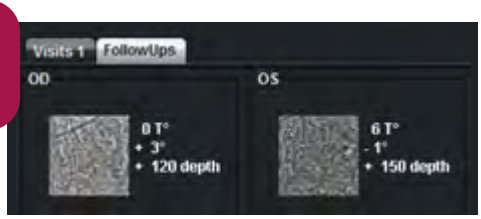
Follow-up images of cones - MEWDS[1]



Follow-up images of micro-aneurisms[2]

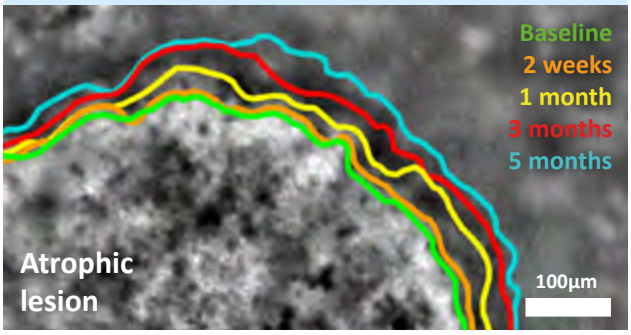
> *The rtx1 allowed us to directly observe stem-cell-derived RPE cells after their transplantation in a patient's retina. We could verify that the mosaic arrangement of these cells was similar to that of natural RPE cells, and stable over time.*
>
> Dr. Takagi, Kobe City Eye Hospital, Kobe, Japan, 2019.

New ! Follow-up module

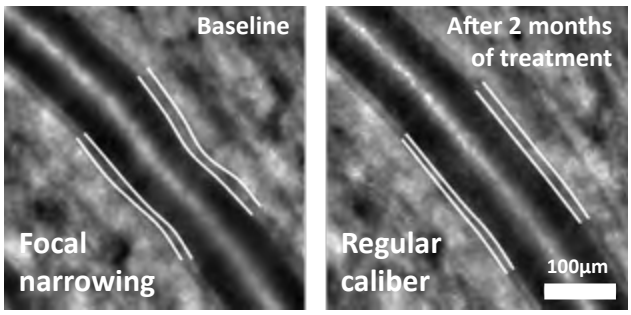


Easily save and compare followed-up images

> *During the follow-up of AMD patients, the rtx1 enabled detecting the progression of atrophic lesions over a timescale of weeks, instead of months with conventional imaging.*
>
> Pr. Paques, Quinze-Vingt National Hospital, Paris, France, 2020.



Geographic atrophy progression[1]



Arteriolar remodeling during anti-hypertensive therapy[3]

The reference in adaptive optics retinal imaging

The rtx1 is the only AO imaging device that has received regulatory clearance in multiple countries[1]. With over 200 peer-reviewed publications, it is the most widely used AO device in clinical settings throughout the world.

Enable new advances in biomarkers

The rtx1 empowers clinical researchers to investigate an array of candidate biomarkers for assessing retinal anatomy and pathologies at the cellular level. With the AOdetect™ application[2], supervised image segmentation enables analyzing the distribution of cell-like structures and the wall morphology of blood vessels.

[2] Courtesy of Nippon Medical School Hokusoh Hospital, Chiba, Japan

[3] Courtesy of Pitié-Salpétrière Hospital, Paris, France

> *The image resolution achieved by this technology is superior to that of any other current diagnostic tool.*
>
> Zaleska-Zmijewska et al. *Journal of Diabetes Research 2017*, 1–9.

> *Adaptive optics retinal imaging provided non-invasive and sensitive information on the pathological disruption of the cone mosaic, even in the absence of subjective (visual loss) or objective (diagnostic imaging) abnormalities.*
>
> Ziccardi et al. *American Journal of Ophthalmology 160,* 301–312.e6.

> *AO technology will likely contribute to faster and more cost effective drug development for the treatment of eye diseases.*
>
> Lin et al. *Invest Opth Vis Sc 2019,* 60:4520-4531.

TECHNICAL SPECIFICATIONS

rtx1-e adaptive optics retinal camera

Imaging type	En face reflectance imaging
Detection type	Low-noise CCD camera
Illumination	Near infrared LED, 850nm
Exposure time	< 10 ms
Imaging field of view[3]	4° x 4°
Fixation stimulation range	H ± 14.4° / V ± 10°
Camera pixel pitch on the fundus[3]	1.1 µm
Optical resolution on the fundus[3,4]	250 line pairs per millimeter (lppmm)
Adaptive optics control	Fully automated, resistant to blinking and movement
Depth focussing range[3]	1600 µm
Pupil diameter	≥ 4 mm
Refractive error compensation	-12 to +6 D
Total footprint (WxDxH)	137 x 53 x 132-162 cm

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1. **rtx1** is a certified medical device of class IIa in the European Union. **rtx1** is an approved medical device in Japan, China, and Korea. In the USA, **rtx1** has not received FDA clearance; it is an investigational device that requires Institutional Review Board (IRB) oversight.
   For use by trained eyecare professionals only.
2. **AOdetect** is an option of the certified rtx1 device in the European Union, Japan and Korea. In other territories, **AOdetect** is a separate product for research use only.
3. Some specifications are dependent on several factors including but not limited to: ocular biometry, pupil diameter, optical defects, ocular media transparency.
4. The system can image line pairs of 2 µm in line width.