The aim of this study is to compare macular retinal layers and choroidal thicknesses of patients with Alzheimer’s disease (AD) with those of patients without other known ophthalmological pathology, using spectral domain optical coherence tomography (SD-OCT). Fifty eyes of 50 patients (mean age 73.10; SD=5.36 years) with a diagnosis of mild AD and 152 eyes of 152 patients without AD (mean age 71.03; SD=4.62 years) were included. There was a thinning in the peripheral ring of the ganglion cell layer (GCL) in the AD group (S6 p < 0.001; T6 and N6 p = 0.001). In the superior sectors of the inner plexiform layer (IPL), differences between the two groups also remained statistically significant after Bonferroni correction (S3 p = 0.001 and S6 p < 0.001). Patients with AD showed a significant reduction in retinal layers and choroidal thickness. The thinnest macular measurements were found mostly in the inner layers, GCL and IPL, at superior pericentral and peripheral rings. This thinning may represent a possible retinal biomarker of AD, related with both primary retinal lesion and transsynaptic retrograde degeneration and the choroidal thinning probably reflects the importance of vascular factors in the pathogenesis of this disease.

2164 Cholesterol and the extracellular deposits of age-related macular degeneration (AMD)
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Summary: AMD is a prevalent cause of central vision loss in older persons worldwide. The best documented intraocular risk factor for progression is drusen, i.e., extracellular deposits between the RPE basal lamina and the inner collagenous layer of Bruch’s membrane. Clinico-pathologic correlation, histochemistry for esterified and unesterified cholesterol (EC, UC), lipid-preserving ultrastructure, gene expression, and lipid profiling indicating enrichment in linoleate combine to suggest that the major component of soft drusen in central macula are large apolipoprotein B,E lipoproteins secreted by the RPE. This theory has received strong experimental support with a primary RPE cell culture system that lays down sub-RPE deposits without supplementation with outer segments. Through histologically-validated clinical imaging, a second layer of deposits between the photoreceptors and RPE, called subretinal drusenoid deposits is now recognized (SDD, originally called reticular pseudodrusen). Drusen have both EC and UC, and SDD have only UC. Further, soft drusen are abundant in central macula and SDD are abundant in the perifovea, thus linking distinctive cholesterol-containing deposits to the physiology of cone and rod photoreceptors.

2761 Gene regulation and lens development: insights from single-cell RNA-seq analysis
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Summary: Lens progenitor cells emerge from a common pool of anterior pre-placodal cells located at the border between the neuroectoderm and surface ectoderm. Multiple lines of evidence exist to support critical roles of BMP and FGF signaling in this process. Our goal was to elucidate the complete transcriptome of lens progenitor and precursor cells. Human ES cells were differentiated into lens cells using noggin,BMP+/FGF+/FGF). In the second stage, BMPs were added ± FGF2. The system was analyzed at between days 6–21 using single cell RNA-seq, using a PDMS co-flow microfluidic droplet generation device. Each cell was barcoded and sequenced using HiSeq2500 rapid mode. A total number of 25–30 000 of cells were captured and data were analyzed using tSNE. The proteomes of mouse lens were analyzed using tandem MS. DLX5 and FOXG1 expression are first activated followed by SIX1 and DLX2 expression. Evidence for common lens/olfactory is supported by the identification of ALDH1A3+/PAX6+/GATA3+ cells. Collectively, these studies show that lens cells are formed between days 12–18 of the cultures. Ongoing experiments are aimed to identify how BMP and FGF signaling direct formation of the lens progenitor cells.
Conclusions: Results suggest that G6PD-deficient and G6PD-normal men have similar macular and optic disk blood flow. Larger scale studies are necessary to confirm these findings.

S104
Collagen and alpha smooth muscle actin distribution in in-vitro and in-vivo developed posterior capsule opacification
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Purpose: To compare the expression of collagen and alpha smooth muscle actin (αSMA) in lens capsule samples after a short and long term post cataract surgery.

Methods: Twenty-four human donor eyes were obtained, and separated into three different groups: IOL capsules (n = 12): lens capsules with IOLs and varying degrees of Soemmering's ring formation, Cultured capsules (n = 6): emptied capsular bags, cultured for 1-month and Intact lenses (n = 6). All samples were stained with H&E, αSMA and Picro Sirius Red for collagen I, II and IV.

Results: All Cultured capsules except one, expressed αSMA which tended to concentrate near the capsule. IOL capsules only expressed αSMA in areas where the capsules adhered to each other. Intact lenses did not express αSMA. All samples expressed collagen I and IV in the lens capsules, and collagen I and III in the ciliary muscles. None of the Intact lenses or Cultured capsules expressed collagen in any other area.

Conclusions: Intact lenses (Cultured capsules) and Intact lenses (IOL capsules) were found near the IOL, creating a type of seal.

2335
Mycotic keratitis – the threat of today?
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Summary: Mycotic keratitis is a comparatively rare but serious ophthalmological disease, that can possibly lead to a severe loss of vision up to blindness. Over the last two decades an increase of cases with mycotic keratitis has been noticed, which is possibly caused by an increased use of soft contact lenses. In this talk we would like to give an overview on the typical clinical signs, symptoms, diagnostics and therapy as well as new diagnostic methods of keratomyocysis.

2934
Intracorneal ring segments (INTACS) – long-term results of the first 100 keratoconus patients
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Summary: Implantation of intracorneal ring segments (ICRS) using a femtosecond laser represents a reliable option to widen the spectrum of the stage-related therapy of keratoconus in patients with contact lens intolerance, post-LASIK-keratectasia, or pellucid marginal degeneration (PMD).

Between August 2011 and February 2018, ICRS (Intacs-sk, Addition Technology, Inc.) were implanted in 101 eyes of 81 patients with clear central cornea. The patients had to fulfill the corneal diagnostic criteria required for implantation. Tunnel creation should nowadays only be carried out by femtosecond laser, in order to avoid intra- and postoperative complications.

Two years after surgery, the patients showed an increase in uncorrected (logMAR) from 0.9 ± 0.1 to 0.4 ± 0.1 and bestcorrected distance visual acuity (logMAR) from 0.4 ± 0.2 to 0.2 ± 0.1.

Uncorrected and corrected distance visual acuity can be improved by implantation of the ICRS. Progression of ectasia seems to be retarded. Complications after ICRS implantation are rare due to strict patient selection and modern surgical techniques.