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ORAL 1
A suspected inherited retinal degeneration due to a mutation in the retinitis pigmentosa (RP) 1 gene in normande dairy cattle
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Purpose: This study describes the phenotypic consequences of a frameshift mutation in the RP1 gene. Methods: Three affected normande cows, from an experimental facility (n = 17) and a private farm (n = 15) were selected for ocular examinations. These included 7 homozygous affected (mean age 4.7 years [1-8]), 11 heterozygous (mean age 5 years [2-8]), 12 homozygous normal animals (mean age 4-1 years [6]). The exams included menace response. Results: Dazzle and pupillary light reflexes, slit-lamp biomicroscopy, and indirect ophthalmoscopy with a 10 D and a 20 D lens. Electroretinography was performed on one normal (homozygous wild type) and one affected (homozygous mutated) adult cow. Results: Among the homozygous mutated cows, animals over 4 years old (n = 7) presented with bilateral signs of retinal degeneration (hyperreflective tapetal area, diminished retinal vasculature). Two of them showed marked visual deficits, one was blind. Among the heterozygous animals, 8 presented with fundi within normal limits. 2 had moderate signs of retinal degeneration with preserved vision, and one was bilaterally affected with retinal degeneration and blindness. All the homozygous non-affected animals had fundi within normal limits, except one which presented with bilateral retinal degeneration and preserved vision. Full field electroretinography showed a complete absence of response in the homozygous affected cow and a normal response in the control. Conclusion: This study documents the pathogenicity of the frameshift mutation in RP1 in homoygotes. Further studies needed to investigate a potential effect in heterozygotes and to eventually map additional loci affecting vision in Normande dairy cattle.

ORAL 2
Optimizing gene transfer to retinal cells by delivering av vectors via the intravitreal route
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Purpose: To improve targeting of retinal cells with AAV vectors delivered intravitreally. Methods: Three approaches were tested in normal dogs: 1) injection (200 µL) of an AAV2/2/3/2-CAG-LacZ reporter construct (3×11 and 1×12 µg/ml) in both eyes of a dog that had prior pars plana vitrectomy (PPV); 2) injection (200 µL) of AAV2/2/3/2-CAG-LacZ-(LH+L1)+1×12 µg/ml in both eyes of one dog followed immediately by multifocal retinotomies, and 3) injection (200 µL) in 2 dogs of two scAAV capsid variants (9E+11 to 1E+11 µg/ml). We identified following an in vivo directed selection performed in six dogs. The scAAV capsid variants carried the eGFP reporter gene under the control of the ubiquitous CAG promoter. Two to 8 weeks post intravitreal, retinal distribution and cell tropism were examined by cSLO imaging and/or by immunohistochemistry. Results: Eyes with PPV had no retinal injection sites that contained lacZ. Retinal puncture improved transduction of RGCs, but LacZ signal was limited to RGCs immediately surrounding the retinotomy sites. scAAV capsid variants targeted RGCs, and Müller cells, however, photoreceptor and RPE transduction was variable. Conclusion: A possible cause for the lack of transduction of retinal cells in vitrectomized eyes could be an accelerated clearance of the AAV. Mechanical puncture of the ILM favored AAV transduction of RGCs but pan-retinal biolubration was not achieved. The directed evolution approach converged towards two AAVs that inject RGCs and Müller cells; testing of other capsid variants that can efficiently target the outer retina following intravitreal delivery is currently on-going. Support: NIH, NEI EY-06855, EY-17549, PN2EY022012, R24EY022012, P01EY051583, F30 Wynn-Gund TRAP, Macula Vision Research Foundation, Research to Prevent Blindness, Inc.

ORAL 3
Residual rod function in CNGB1 mutant dogs
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Purpose: Progressive retinal atrophy type 1 in Papillons results from a mutation in the beta subunit of the cGMP-gated channel gene CNGB1, where a frameshift mutation is present. This study was to further characterize the loss of function induced in affected dogs. Methods: Homozygous Cngb1 mutant dogs (Cngb1+/−), age and breed matched controls (Cngb1+/− or Cngb1+/+) and age matched dogs homogenous for the Cngb1 mutation in CNGB1 phosphodiesterase alpha subunit (Cngb1+/+) were studied. Both dark- and light-adapted electroretinogram (ERG) intensity series were performed and compared. Results: Pupils +7° had no detectable rod responses at any age; the same flash intensity stimulus in scotopic and photopic conditions resulted in ERGs of similar amplitude, apart from lower flash intensities. However, the adapted cone responses were faster than the dark-adapted responses. At 5 weeks of age only cone-mediated ERG responses were present in Cngb1−/− puppies (dark- and light-adapted ERG amplitudes were similar) but developed by 7 weeks old with increased amplitudes and markedly increased implicit times (especially at lower flash intensities) had developed. The ERG responses were weakly delayed but were apparent until 4 years of age. Conclusion: Cngb1−/− dogs develop rod responses later during retinal maturation than normal controls. The rod responses have an increased threshold and notably delayed timing. We hypothesize that low levels of Cngabl can provide sufficient cGMP-gated channel activity in rods of Cngb1−/− dogs for a delayed and partial hyperpolarization of outer segments in response to phototransduction. Support: Myers-Dunlap Endowment for Canine Health. Papillon Club of America.

ORAL 4
Evaluation of non-needle electrodes for electroretinography recording in dogs
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Purpose: Needle electrodes are being used routinely for electroretinography (ERG) in dogs. In human patients, non-invasive gold cup electrodes are being used for this purpose. The aim of this study is to evaluate the quality of full field ERG recording in the dog, utilizing gold cup electrodes. Methods: Electroretinography responses were recorded from eight healthy privately owned dogs. All dogs had a complete ophthalmic examination including slit-lamp biomicroscopy and indirect ophthalmoscopy. The ERG responses were recorded utilizing gold cup electrodes as well as needle electrodes. The ERG traces were evaluated offline, both qualitatively and quantitatively. Comparison of the b-wave amplitudes of the rod, combined rod/cone, and flicker responses was performed between traces recorded using gold cup and needle electrodes. Results: Ophthalmic examination findings for six of the eight dogs were unremarkable. Some subtle changes were found in two of the dogs. All traces were of good quality with a high signal to noise ratio. There were significant differences (P < 0.05) between b-wave amplitudes of traces recorded using the gold cup or needle electrodes. Conclusion: Gold cup electrodes provide good quality ERG recordings and are appropriate for use in the dog for this purpose.

ORAL 5
Immune-mediated chorioretinopathy in the flat coated retriever
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Purpose: To examine the presence of anti-retinal autoantibodies in sera from Flat Coated Retrievers (FCRs) affected by chorioretinopathy compared to healthy FCRs. Methods: Ophthalmic examination including at least slit-lamp biomicroscopy and indirect ophthalmoscopy was performed in 21 FCRs in Sweden. Eleven FCRs (10 males and 1 female; mean age 4 ± 2.9 years) were diagnosed with uni- or bilateral chorioretinopathy. The ocular fundus was considered to be normal in 12 dogs (six males and six females; 4 ± 1.5 years). Western blotting was performed with serum from healthy FCRs and FCRs affected by chorioretinopathy using canine retinal extract as antigen source. Blots were evaluated for presence of autoantibodies specific to retinal proteins. Fisher’s exact test was used to assess differences between affected and healthy FCRs in the presence of individual specific antibodies. Results: Thirteen different anti-retinal autoantibodies were found in 10 dogs (nine males, one female) diagnosed with choroioretinopathy and four dogs (one male, three females) without ophthalmoscopic signs of retinal disease. Five autoantibodies binding to retinal antigens with apparent molecular weights of 23-, 36-, 46-, 132- and 136-kDa, respectively were significantly associated with choroioretinopathy. Conclusion: Chorioretinopathy in the FCR, a condition that mimics Working Dog Retinopathy, is associated with presence of circulating anti-retinal autoantibodies. An X-linked predisposing, genetic factor is possible because of the overwhelming majority of affected male dogs. Support: Supported by the Agria and SKK Research Foundation.

ORAL 6
Distinctive anatomic features of the chameleon eye
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Purpose: To describe several distinctive anatomic features of the ocular tissues of chameleons and comment on ocular function. Methods: The COPLOW database was searched and 22 submissions of ocular tissues from chameleons. These specimens were reviewed in an

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effort to record distinctive anatomic features. Results: Channel cats, eyes are adapted to maximally increase accommodative effort to achieve both monocular and binocular depth perception. The cataract possess a uniquely negatively powered lens, which moves the focusing nodal point far forward of the plane of retina. This results in the images that the patient sees on the retina are out of focus in thejudging distances. Accommodation is entirely corneal by means of a unique ciliary muscle. An extremely thin and malleable cornea facilitates corneal accommodation. The central retina is almost entirely devoted to a single, wide fovea. Active and independent eye movements ameliorate the resultant tunnel vision. Although each eye is capable of independent distance vision, the preadaptive capture of insects with the projectile tongue is achieved with biocular stereopsis. Conclusion: Channel cats are predators hunting and feeding on insects, which catch with their projectile tongues. This is a strategy, which requires specialized and unique visual abilities. Among finding optical sensitivities, a high degree of visual acuity, and phenomenal abilities in visual depth perception. We present ocular anatomic features by which channel cats have adapted to achieve these needs.

ORAL 7
Familial congenital cataract in the Bengal cat
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Purpose: To study a congenital cataract in the Bengal cat. Methods: Eleven healthy Bengal cats (seven females, four males) had an ophthalmic examination including a vision assessment, biomicroscopy, indirect ophthalmoscopy, gonioscopy and tonometry. Eight of the cats were related. The cats' ages ranged from 3 months to 3.5 years. Results: All the eyes were visual. All globes and lenses were normal in size, shape and position. The corneas were clear and avascular. Gonioscopy revealed normal pectinate ligaments in all the eyes. IOP readings ranged from 14 mmHg to 19 mmHg. All cats exhibited bilateral nuclear and/or perinuclear cataracts in various shapes. Two cats had posterior polar cataracts, three cats had linear cataracts and six cats had arcus-shaped cataracts of the posterior nucleus. Eight cats had perinuclear cataracts. Three posterior polar cataracts were visualized where secondary corneal sutures closed at the Y sutures, close to the embryonic nucleus. Perinuclear opacities were diagnosed frequently (13/22 eyes). The vitreous and the fundus were normal for each cat. Conclusion: Presumed congenital cataracts in Bengal cats (Burman, British Shorthair, Himalayan, Persian kittens) were not described in the Bengal breed. When looking at the genesis, the condition seems to be related to inherited defects. Specific test metrics must be performed. Further clinical examinations and genetic studies are underway.

ORAL 8
Cataracts in the Russian blue cat
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Purpose: To describe a recently discovered presumed inherited form of cataract in the Russian Blue breed of cat. Methods: A total of 66 Russian Blue cats were examined, during a 10-month period in 2014 in Sweden, using standard examination methods according to the SNVO/ECVO scheme for eradication of presumed inherited eye disease of dogs and cats. The examinations were performed on cats age 1 months to 3 years old. Pedigrees were collected. Ten genetic studies from all examined cats, and buccal swabs for DNA extraction were collected from the 22 relatives. Genetic studies were performed and follow-up. Results: Mild to severe forms of mainly bilateral cataracts were observed in 22 cats of both genders. The most typical form of cataract observed was a small triangular opacity at the border of the posterior nucleus and the anterior part of the posterior cortex. Six of the 22 cats had more extended forms, with involvement of both the entire nucleus and parts of the entire anterior and posterior cortex. The latter forms were distinctive of visual impairment. All examined eyes were normal in shape and position. Conclusion: The seemingly high prevalence of a bilateral, specific type of cataract in the Russian Blue cat (male, 2 months, black and tan) had bilateral iris to iris persistent pupillary membranes and unilat- eral retinal dysplasia in a family of CKCS. The clinical findings of aract, posterior lenticonus and retinal dysplasia in a family of CKCS. The clinical findings of

ORAL 9
Familial retinal dysplasia and microphthalmia with lens abnormalities in the cavalier King Charles spaniel (CKCS)
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Purpose: To report congenital hereditary eye disorders including microphthalmia with cat- aract, posterior lenticonus and retinal dysplasia in a family of CKCS. The clinical findings of bilateral posterior lens dislocation in a dam led to the ocular examination of the stud and the litter. Multiple congenital ocular anomalies of this family are described. Methods: All dogs examined were examined using the ECVO eye scheme and the horizontal corneal diameter was measured (mm) in the awake animals using a caliper. Results: The dam (34 months, black and tan) showed bilateral microphthalmia, and normal looking fundi seems to be a feature in the CKCS. Littermates may be affected with various forms of retinal dysplasia, as in the Akita and the Chow Chow.

ORAL 10
Hereditary eye diseases in dachshunds with focus on cataract and progressive retinal atrophy
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Purpose: To analyze the change in prevalence and incidence of hereditary eye diseases (HED) in Dachshunds by biennial examinations based on breeding regulations, performed by the German panel of veterinary ophthalmologists 'Dortmunder Kreis (DOK)' from 1998 to 2011. Methods: DOK/ECVO examination sheets from 1998 to 2011 were evaluated. Prevalences were analyzed for progressive retinal atrophy (PRA), hereditary cataract (HC), microphthalmia with lens dysmorphogenesis and normal looking fundi seems to be a feature in the CKCS. Littermates may be affected with various forms of retinal dysplasia, as in the Akita and the Chow Chow.

ORAL 11
Use of porcine urinary bladder acellular matrix for corneal repair in dogs and cats
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Purpose: To describe the use of a porcine bladder acellular matrix in the surgical management of deep corneal ulcers in dogs and cats and feline corneal sequestra. Methods: Thirty-two porcine and three cats with corneal sequestra were included. The thickness of the corneas was measured (mm) in the awake animals using a caliper. Results: The dam (34 months, black and tan) showed bilateral microphthalmia (11 mm OU) with nuclear, periphery and a circular dysplastic lesion in the left dorsomedial tapetal periphery. Pup #2 (male, 2 months, black and tan) had bilateral iris to iris persistent pupillary membranes and unilat- eral retinal dysplasia. The sire (27 months, black and tan) had unilateral iris to iris persistent pupillary membranes. Pup #1 (female, 2 months, ruby) had bilateral multifocal and geographical reti- nal dysplasia. The clinical findings of retinal dysplasia in a family of CKCS. The clinical findings of

ORAL 12
Intraoperative use of optical coherence tomography for optimizing surgical treatment and follow-up of feline corneal sequestrum
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Purpose: Feline corneal sequestrum is a common condition in ophthalmologic veterinary practice and is characterized by corneal thinning, stromal edema and corneal sequestrum. The aim of this study is to investigate the imaging capabilities of spectros- tocopic optical coherence tomography (OCT) to help manage the management of feline corneal sequestrum and to assess whether measurements of the quantitative parameters such as sequestrum thickness and corneal thickness, were possible. Methods: The study was con- ducted in a private veterinary practice. The OCT images were recorded and analyzed. Results: Corneal thickness as observed by slit-lamp biomicroscopy, two dogs with corneal perforations and seven dogs with corneal sequestra were included. The necrotic material was removed by keratectomy. The collagen graft (Acell®) was sutured into the keratectomy bed using a continuous suture pattern of Polyglaftine (9-0). A mitracting membrane flap (NMF) was placed to pro- tect the cornea and to prevent graft dehydration. Post-operative treatment included topical tobramycin, atropine and systemic amoxicillin-clavulanic acid. The NMF was removed on day 7 for the 9 most severely affected corneas for complete evaluation. The NMF was then replaced. On day 18 the NMF was removed in all cases. All patients were examined on days 7, 8, 14, 45, 90. Epithelialization of the biomaterial was monitored using fluorescein. Re- sults: Two dogs had no epithelialization of the biomaterial, because of progression of a collagenolytic process. Epithelialization was complete at day 18 in 14/17 cases. Corneal opacity was dense in eyes, moderate in 21, and absent in 69 eyes. Vision tests were performed in 135 eyes. Conclusion: The conclusions of this study are comparable to those of other studies describing the use of other collagen xenografts in the management of corneal defects of various origins.

*References
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†European Panel of Veterinary Ophthalmologists (Dortmunder Kreis).
ORAL 13
Keratomycosis in a pet rabbit (Oryctolagus cuniculus) treated with topical 1% terbinafine ointment
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Purpose: This report describes the clinical presentation, diagnosis and management of Ap.cancellosum keratomycosis in a pet rabbit using topical terbinafine. Methods: Complete ophthalmic and ophthalmoic examinations were performed and corneal scrapings for cytological analysis and samples for bacterial and fungal cultures were taken. Results: At the initial examination, an ulcerative keratitis with multifocal dot shaped, whitish, raised stromal infiltrates and a deep corneal vascularised abscess were noted. Two days later, intensive medical treatment with topical antibiotics, heterologous serum, and systemic NSAIDs was warranted. Individual infiltrates coalesced to form a dense, whitish/yellowish, elevated and fluorescein-positive plaque. The abscess progressed to a 360° circle and hypopyon was present. The fungal origin was confirmed 2 days later from culture results identifying the organism as Apic. felis. Antifungal treatment with terbinafine 1% dermatologic ointment four times a day was initiated. Considering the few available topical antifungal drugs for veterinary use in France, the choice of terbinafine was based on its broad-spectrum activity, its efficacy in human fungal keratitis and equine keratitis (personal communication) and for financial and availability reasons. At the last follow up, 8 weeks after the initiation of treatment, complete clinical resolution of the fungal lesions was observed. A control fungal culture was negative. Conclusion: To the author’s knowledge, this is the first report of spontaneous keratomycosis and successful treatment with topical terbinafine in a pet rabbit. The topical application of the dermatologic ointment of terbinafine was well tolerated and efficient against Apic. felis in this rabbit.

ORAL 14
Tear film proteomics and eyelid histopathology of pugs with ocular surface abnormalities
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Purpose: The purpose was to determine the difference in eyelid histology between pugs and other brachycephalic breeds and analyze the tear film protein profiles in a pug population, as potential contributing factors to the high prevalence of ocular disease in pugs. Methods: Complete ophthalmic examinations of pugs presenting with ophthalmologic abnormalities, pugs without history of ocular disease and other brachycephalic breeds were performed. Histology of eyelid tissue obtained from dogs with an eyelid disease was performed, using HE- and oil-red-o-staining. Tear fluid collected from pugs using Schirmers-Tear-Test strips was categorized according to severity of the associated corneal disease (none, mild, moderate, severe). 2D-gel-electrophoresis of selected samples was performed. Protein spots pattern obtained with fluorophore or silver-staining were evaluated using ImageMaster-2D-Platinum-software. Results: The percentage of iridocorneal angle affected by goniodysgenesis was estimated and classified as unaffected (<25%) or affected (>25%). Results: Seventy one of 210 (13.8%) BH, 29 of 170 (17.1%) PCR and 20 of 101 (19.8%) DDFT presented between September 2013 and December 2014. The percentage of iridocorneal angle myopia affected by goniodysgenesis was significantly higher in BH than both PCR (P = 0.001) and DDFT (P = 0.01). In all breeds there was a significant association between goniodysgenesis and age (P ≤ 0.006). In the BH only there was a significant association between goniodysgenesis and sex (P = 0.003). In the PCR and DDFT the gender distribution between IOP and both goniodysgenesis were (P = 0.006) and age (P = 0.001). Conclusion: The association between goniodysgenesis and age is probably explained by the progression of goniodysgenesis over time, accounting for the fact that the prevalence of goniodysgenesis remains high in all 3 breeds, despite widespread screening. The associations between goniodysgenesis and sex in the BH and between goniodysgenesis and goniodysgenesis in the PCR and DDFT are novel findings and warrant further investigation. Support: Dogs Trust.

ORAL 15
Prevalence and progression of goniodysgenesis in the Welsh springer spaniel
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Purpose: (i) To determine the current prevalence of goniodysgenesis in the UK populations of Basset Hounds (BH), Flatcoated Retrievers (FCR) and Dandie Dinmont Terriers (DDT). (ii) To investigate possible associations between the degree of goniodysgenesis and age, sex and intraocular pressure (IOP). (iii) To investigate possible associations between IOP and age, goniodysgenesis and sex of the dog. Methods: Gonioscopy and rebound tonometry were performed in both eyes of 221 dogs (85 male, 136 female). Results: Of the 221 dogs, 67 (30.3%) were affected with goniodysgenesis. There was no association of goniodysgenesis with sex, age or with IOP. Prevalence of goniodysgenesis was significantly higher in BH than both FCR (P < 0.001) and DDT (P < 0.001). In all breeds there was a significant association between goniodysgenesis and age (P < 0.006). In the BH only there was a significant association between goniodysgenesis and sex (P = 0.003). In the PCR and DDFT the gender distribution between IOP and both goniodysgenesis were (P = 0.006) and age (P = 0.001). Conclusion: The association between goniodysgenesis and age is probably explained by the progression of goniodysgenesis over time, accounting for the fact that the prevalence of goniodysgenesis remains high in all 3 breeds, despite widespread screening. The associations between goniodysgenesis and sex in the BH and between goniodysgenesis and goniodysgenesis in the PCR and DDFT are novel findings and warrant further investigation. Support: Dogs Trust.
ORAL 19

The effects of topical parasympathomimetics drugs on pupil diameter and iop in normal dogs treated with 0.005% latanoprost.

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Purpose: Prostaglandin analogues induce miosis and lower intraocular pressure (IOP). Parasympathomimetics drugs induce miosis and may cause IOP elevation. As pupils of latanoprost-treated, glaucomatous dogs may have to be dilated for ophthalmoscopic examination, we studied whether 0.5% tropicamide and 1% atropine alter the effects of 0.005% latanoprost on pupil diameter (PD) and IOP in normal dogs. Methods: IOP and PD were measured hourly, 8 AM – 4 PM, with the right and left eyes serving as control (CE) and treated (TE) eye, respectively. Baseline values were measured in Labrador retrievers during five sessions with 1-week washout: (1) Without treatment (n = 10). (2) Latanoprost at 8AM (n = 10); (3) Tropicamide at 8AM (n = 10) and latanoprost at 11AM (n = 10); (4) Latanoprost at 11AM (n = 10). Results: At 4PM, TE PD was 1.22 ± 0.65, 3.06 ± 0.56 and 8.12 ± 1.12 mm in sessions 2, 4 and 3, respectively. TE PD was significantly different between treatment sessions (P = 0.03, Friedman test), but the most hypometric session was 3. At 4PM, TE IOP was 7.1 ± 1.6 mm Hg. Tropicamide and atropine caused significant increases in IOP in normotensive dogs, tropicamide and atropine counteracted the miotic effect of latanoprost, with atropine causing significantly larger mydriasis. Tropicamide and atropine did not counteract the miotic effect of latanoprost. Conclusion: Tropicamide and atropine counteracted the miotic effect of latanaprost, with atropine causing significantly larger mydriasis. Tropicamide and atropine did not counteract the hypotensive effect of latanaprost treatment.

ORAL 20

Internal and external ophthalmoplegia in three dogs

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Purpose: The purpose of this case series was to emphasize the importance of a neuro-ophthalmologic examination and stress the value of magnetic resonance imaging (MRI) in the investigation of ophthalmoplegia. Methods: Complete ophthalmologic examination associated with pharmacological testing and MRI were performed in all cases. Results: All three cases of this neuro-ophthalmologic investigations of the right ophthalmoplegia of the right eye through ocular examination. Cases 1 & 2, also presented with right internal ophthalmoplegia. The MRI finding for these two cases was a contrast enhancing mass at the junction between the right sphenoid and the midbrain in the area of the entrance of the oculomotor nerve. Concomitant neurological deficits of the right ophthalmic and mandibular branch of the trigeminal nerve were consistent with oculomotor cranial nerve III syndrome. MRI for the latter a diffuse contrast enhancing thickening of the trigeminal nerve from its origin to the division into its three branches. Differentials for these MRI findings included neoplasia as a particular suspicion for peripheral nerve sheath tumor. Conclusions: This case series included cases of external ophthalmoplegia combined with either internal ophthalmoplegia or trigeminal nerve defects. MRI was suggestive of a neoplastic process in the area of the emergence of cranial nerve III and V for cases 1 & 2, respectively.

ORAL 21

Repeatability and reproducibility of lens diameter and axial globe length measurements using high frequency B-mode ultrasound in dogs with cataracts.

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Purpose: To determine repeatability and reproducibility of lens diameter and axial globe length measurements using high frequency B-mode ultrasound in dogs with cataracts. Ultrasonography was performed on 108 dogs (169 eyes) before phacoemulsification. Lens diameter (LD) and axial globe length (AL) were measured retrospectively on still images. Larval ultrasonography was performed on 108 dogs (169 eyes) before phacoemulsification. Lens diameter (LD) and axial globe length (AL) were measured retrospectively on still images. Results: Cases 1 & 2, also presented with right internal ophthalmoplegia. The MRI finding for these two cases was a contrast enhancing mass at the junction between the right sphenoid and the midbrain in the area of the entrance of the oculomotor nerve. Concomitant neurological deficits of the right ophthalmic and mandibular branch of the trigeminal nerve were consistent with oculomotor cranial nerve III syndrome. MRI for the latter a diffuse contrast enhancing thickening of the trigeminal nerve from its origin to the division into its three branches. Differentials for these MRI findings included neoplasia as a particular suspicion for peripheral nerve sheath tumor. Conclusions: This case series included cases of external ophthalmoplegia combined with either internal ophthalmoplegia or trigeminal nerve defects. MRI was suggestive of a neoplastic process in the area of the emergence of cranial nerve III and V for cases 1 & 2, respectively.

ORAL 22

Septic lens implantation syndrome in a dog following a lens cat claw injury with positive medical outcome. H Sarfati and Y Segev
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Purpose: To describe the diagnosis, treatment and clinical outcome of Septic Implantation Syndrome (SIS) that most often occurs in dogs where a cat claw inoculates bacteria into the lens cortex and development of lenticonus abscess following capsule rupture, resulting in a delayed-onset endophthalmitis and glaucoma. Methods: A 3 year-old male, intact, Golden Retriever was referred to EYE CARE Clinic 2 days after a cat claw injury to the right eye. Examination revealed a corneal perforation, a 3 mm lens capsule rupture and mild anterior uveitis. Due to good response to medical treatment, the owner declined further treatment and the dog was rechecked following month the corneal ulcer healed and the anterior uveitis resolved. The eye remained quiet on long-term follow-up checks. Eight months later, the cat reached in the same treatment area for 2 days the uveitis improved but the lens remained unchanged. Since lenticonus abscess was suspected the dog underwent lens removal. Lens capsule histopathology revealed severe supportive inflammation and Gram stain was positive for Gram- bacteria, confirming the diagnosis of SIS. Results: Following surgery, the eye improved dramatically. Seven months post-surgery, the dog was visual, pain free with no clinical sign of uveitis. Conclusion: Previously published SIS cases were diagnosed based on histopathology following evaluation. To our knowledge this is the first documented clinical case of SIS with a positive outcome.

ORAL 23

Sequencing of the fibrillin-1 gene in cats with primary lens instability. S Maini, O Forman, J Oliver, L Pettitt and C Mellersh
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Purpose: To sequence the fibrillin-1 gene (FBN-1) in domestic short-tailed (DST) cats, in order to identify variants associated with primary lens instability (PLI). A previous study of a family of nine affected cats identified an association between PLI and a microsatellite flanking FBN-1. Mutations affecting FBN-1 are known to cause Marfan syndrome and ectopia lentis in humans. Methods: DNA was sequenced from nine DST cases, and three unaffected control cats. Primers for polymerase chain reaction (PCR) amplification of the coding exons of felines FBN-1 were designed based on the feline genome build (Fel-Cat). Products of PCR were pooled for each individual, and Nextera sequencing libraries prepared and sequenced on the Illumina MiSeq platform. Alignment sequence reads were visually assessed for deletions, insertions and single nucleotide polymorphisms (SNPs). Results: A total of 25 SNPs were identified, two of which were exonic (one synonymous, one missense). The nonsense mutation resulted in a change from a glutamic acid to lysine. Cross species conversion assessment and use of the predictive tool SIFT suggested the variant to be tolerated and unlikely to be pathogenic. Conclusion: Exonic coding variants have been excluded as the cause of PLI in the affected DST cats in this study. Full investigation of non-coding regions of FBN-1 would be required to fully exclude the gene.

ORAL 24

Evaluation of manual epilation as treatment for ectopic cilia in dogs. N Park* and B Beckwith-Cohen†
Inntegrative Ophthalmology for Pets, Los Angeles, CA, USA; †VCAs West Los Angeles, Los Angeles, CA, USA

Purpose: To determine the utility of manual epilation under topical anesthesia as a practical treatment for ectopic cilia. Methods: Twenty-two eyes of 21 dogs diagnosed with ectopic cilium by slit lamp biomicroscopy were evaluated retrospecively. All dogs were treated with topical proparacaine hydrochloride 0.5% and underwent manual epilation using cilium forceps. Treatment success was defined as lack of documented or reported ectopic cilium for at least 3 months. Results: The median age at presentation was 21.5 months (range: 4.5 – 163 months). Overrepresented breeds included the English Bulldog (n = 6) and Shih Tzu (n = 5). Twenty-two of 22 eyes showed no recurrence during a median follow-up time of 12 months (range: 4.5–48 months). The median time for recurrence in the remaining nine eyes (eight dogs) was 29 days (range: 10–181 days). Four eyes of three dogs ultimately underwent en bloc surgical excision of their ectopic cilium. Three eyes were treated by manual epilation one additional time and have shown no recurrence over a follow-up time of three to 29.5 months. One dog was treated by manual epilation an additional two times and has shown no recurrence over a follow-up time of 21.5 months. The remaining dog had multiple recurrences of ectopic cilium and underwent repeated manual epilations until it was lost to follow-up 20 months after the initial treatment. Conclusion: This study supports manual epilation as a practical treatment for ectopic cilia.

POSTERS ABSTRACTS

POSTER 1

A presumed dysontogenetic orbital cyst in a dog. M Algoeweber, J Säh, M Berger* and AD Gruber*
Animal Eye Practice, Berlin, Germany; *Practice for Small Animal Surgery Dreilinden, Berlin, Germany; †Institute of Veterinary Pathology, Freie Universität Berlin, Germany

Purpose: We describe the clinical, histopathological features and the treatment of an orbital cyst in an American Bulldog. This is likely to be the first report of a dysontogenetic orbital cyst in a dog induced by defective embryonic development. Case: A 1-year-old male American Bulldog was presented for a progressive swelling of the nasal aspect of the left eye of 4 months duration. Clinical examination revealed an elastic swelling of the left naso canthus

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area with orbital involvement. The left nasolacrimal duct was obstructed. Computed tomography (CT) of the head revealed a large extraconal mass with thinning and atrophy of the adjacent orbital bone. Fine needle aspiration revealed a viscous gold-yellow fluid with mild purulent infiltrate without any evidence of neo-plastic cells. A surgical excision was performed via left modified lateral orbitotomy through the zygomatic arch and the calcified orbital lamina, followed by resec-

tion of the zygomatic bone. The cat recovered uneventfully from the surgery and was dis-
charged 5 days post the surgery. The cat remained free of disease, and it should be included in the differential diagnoses of third eyelid masses. The etiology is unknown, but possible associations include trauma, focal inflammation, orbital masses, or neoplasia.

## POSTER 6

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

*Instituto Universitario de Oftalmologia Aplicada (IOUA), University of Valladolid, Spain; †Centro en Red de Medicina Regenerativa y Terapia Celular, Valladolid, Spain

**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 7

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 8

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 9

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 10

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 11

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 12

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 13

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 14

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 15

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 16

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 17

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 18

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-

## POSTER 19

Mesenchymal stem cell conditioned-medium effects on the retinal pigmented epithelium cell proliferation

I Fernandez-Bueno,‡ MT Garcia-Gutierrez,§ JC Pastor,* I Fernandez-Bueno,* and GK Sivivastva*‡

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**Purpose:** To assess the effect of different Adipose-Derived Mesenchymal Stem Cell (ADMSC) conditioned-medium on the retinal pigmented epithelium (RPE) cell prolifera-
intracorneal lens placement were performed in both eyes. After surgery, refraction was within ±0.25D in both eyes. Ocular motility and visual behavior were excellent. The study was concluded as evidence on the basis of improved tracking and feeding behavior. Conclusion: Successful phacoemulsification and intracorneal lens implantation for visual rehabilitation in an eagle owl were achieved. The power and size of the intracorneal lens, based on measurements obtained and Binkhorst equation, were calculated easily and correctly.

POSTER 8

Exploration of corneal hemangiosarcoma in two cats A Bonfanti,* C Giudice and C Peruccio†
*Clinica Veterinaria Gran Sasso, Milan, Italy; †Department of Veterinary Medicine, University of Sao Paulo, Brazil

Purpose: To describe primary corneal hemangiosarcomas in two cats. Methods: A 10-year-old female spayed domestic short-haired (DSH) cat was presented with a bleating iris in the central cornea of the left eye and a history of a perforating ulcer. Cat 2, an 8-year-old male neutered DSH, was presented for left eye opacity involving about 70% of the cornea. In both cases, lamellar keratectomy was performed and corneal specimen were sent for histopathology. Lesion relief occurred after 3 months in the first cat and 2 years in the second cat. Conclusions: Hemangiosarcoma of the cornea is a rare disease, but it is a cause of visual distress in cats. Patients are usually monitored for clinical signs of ocular surface infection were not observed, patients under ESED therapy should be closely monitored for evidence of bacterial and fungal infection. Support: FAPESP 2009/0274-5.

POSTER 10

Expression of matrix metalloproteinases and pcnA in deep corneal ulcers treated with platelet-rich and platelet-poor plasma: experimental study in rabbits CS Perches,* CH Pellizzon,† JJT Ranzani,‡ C Donatti,*, NB Merlini,*, †JF Fonzar,* HEO Beserra,*‡ NS Rocha† and CVS Brandão‡
*Department of Veterinary Science and Public Health, Faculdade de Medicina Veterinária, São Paulo State University - Unesp, School of Veterinary Medicine, Campus of Botucatu, São Paulo, Brazil; †Department of Veterinary Clinic, São Paulo State University - Unesp, School of Veterinary Medicine and Animal Science, Campus of Botucatu, São Paulo, Brazil; ‡Department of Morphology, São Paulo State University - Unesp, Biosciences Institute Botucatu, São Paulo, Brazil

Purpose: The aim of this study was to evaluate the influence of platelet-rich (PRP) and platelet-poor plasma on PCNA and MMPs expression during repair of deep corneal ulcers. Methods: Forty-five female rabbits were divided into 3 groups (n = 15), referred as GR (PRP), GP (PPP) and GC (controls), in accordance with treatment. All animals under- went surgical induction of unilateral corneal ulcer by vacuum trephine followed by debridement using crescent knife. PRP and PPP eye drops were made by using centrifuged blood using a standardized protocol, and instilled every 5 h. In GC group, PBS was used. Meloxicam (0.2 mg/kg, IM, SID) and morphine (2 mg/kg, IM, QID) were administered to control pain. Each group was subdivided (n = 5), according to the final time point, M4 (4 days), M7 (7 days) and M10 (10 days). The animals’ corneas were processed for morphological and immunohistochemical analysis for PCNA, MMP1, MMP2, MMP9, TIM1- VEGF, in duplicates for each animal. Results: The Monitoring Center for Zoonotic and Wildlife Disease and Surveillance, Marabai District, Thailand; §The Monitoring Center for Zoonotic and Wildlife Disease and Surveillance, Marabai District, Thailand; †Prasat-Arbon Animal Hospital, Marabai District, Thailand; ‡Veterinary Science, Veterinary Clinic, Thailand

Purpose: To report a case of persistent pupillary membranes in a Bengal tiger. Methods: A 9 month old female tiger cub was presented for evaluation of cloudy right eye since birth. An ophthalmic examination was performed as a part of a physical health check, including; Schirmer tear test (STT), fluorescein dye application, tonometry, slit lamp biomicroscopy, and fundoscopy. Blood samples were collected and submitted for major viral and protozoal infections such as feline leukemia virus, feline immunodeficiency virus, feline calicivirus, feline coronavirus, Toxoplasma gondii and Toxoplasmosis. Complete blood count and blood chemistry profile results were normal and negative results for virus infections and T. gondii exposure were obtained. Ophthalmic examination findings in the right eye included a cloudy cornea due to iris-to-corneal pupillary membranes, mild corneal edema, and a mild perilimbal hyperemia. STT and IOP were in the normal range, and no abnormalities were found at the slit lamp. Further examinations were performed at 6 months and 1 year follow-up, respectively. Conclusion: In Thailand, this is the first reported case of persistent pupillary membranes in a tiger. In a tiger cub, the presence of persistent pupillary membranes should be considered as differential diagnosis for a cloudy eye and as a congenital developmental anomaly. Additional investigation of any possible causes such as inheritance, health, or nutrition status should be evaluated for the congenital problem in this certain species.
P OTER 14
Neuronal cell loss in the rat retina after immunization with retinal antigens
C Casola,* S Reinehr,* S Kühn,* BM Spiess,* HB Dick,* and SC Joachim*
*Experimental Eye Research Institute, Ruhr-University Eye Hospital, Bochum, Germany; †Equine Department, Vetecus Faculty, University of Zurich, Zurich, Switzerland
Purpo se: Glaucoma is a neurodegenerative disease in animals and humans. Different possible pathogenic factors were described, including the involvement of the immune system. Previously, immunization of rats with glaucoma-related antigens induced retinal ganglion cell (RGC) degeneration. The purpose of this study was to investigate alterations in retinal cells after immunization with a glial cell-derived neurotrophic factor (GDNF) or GDNF plus heat shock protein 27 (HSP27). Methods: Rats were immunized with GDNF and GDNF–HSP27. After 4 weeks retinas were stained with Brn-3a and NeuN to quantify RGC density and to identify those cells that were stained with parvalbumin, and photoreceptors with rhodopsin and opsin. Animals were handled in accordance with the ARVO Statement for the Use of Animals in Ophthalmic and Vision Research. Results: Compared to controls, retinal RGC density was significantly lower in Brn-3a+ RGCs (GDNF: P = 0.025; GDNF–HSP27: P = 0.04) or NeuN+ RGCs (GDNF: P = 0.017; GDNF–HSP27: P = 0.04). In the GDNF group the GFAP/vasoressin area was significantly increased (GFAP: P = 0.0005; vasoressin: P = 0.007), but no changes could be observed in the GDNF–HSP27 group. A loss of amacrine cells was detected in the GDNF but not in the GDNF–HSP27 group. Photoreceptors were not affected. Conclusions: Immunization led to a significant RGC loss. In the GDNF group, an activation of macroglia, but no further damage of retinal cells was observed. In the GDNF–HSP27 group, we detected no macroglial activation but a loss of amacrine cells. We propose that an inhibition of the cell activity occurs after GDNF–HSP27 immunization. Therefore, the inner nuclear layer is more affected.
Suppor t: German Research Foundation (DFG, JO-886/1-3).

P OTER 15
Comparison of globe dimensions in different canine breeds
C Chiwitt, S Baines, P Mahoney, A Tanner, CL Heinrich, M Rhodes and JH Featherstone
Willows Veterinary Centre & Referral Service, Solihull, West Midlands, UK
Pur pos e: To measure normal globe size in the dog, to make breed comparisons and to establish a reference range in some breeds. Methods: An extensive archive of skull scans obtained by computed tomography (CT) was reviewed for efficient retrospective data acquisition. Data were collected on 89 individual dogs with non-neoplastic and non-traumatic globe dimensions included. The globe length, width and height were measured in three planes. Ten different breeds were evaluated with a minimum of eight dogs per breed (n = 94). A subset of 10 dogs of each breed was selected for normal globe dimensions. All measurements were reproducible (intra-class correlation coefficient 0.95–0.89). Results: The breed effects were significant for the breed weight of 15%–48% and for the breed height of 11%–35% of the total variance. Conclusions: A breed-related variation of globe size exists. This knowledge will be useful for the clinical and the scientific setting.

P OTER 16
Tear production and intraocular pressure values in captive lizards Pogona vitticeps
L Boccardi,* A Cirla,* †N Benni,* M Salvadori,*† and G Barsotti†
*Department of Veterinary Sciences, University of Pisa, Pisa, Italy; †Clinica Veterinaria Privata San Marco, Padova, Italy; ‡Centro Veterinario Exotic Vet, Pisa, Italy
Purpos e: To determine reference values for tear production and intraocular pressure (IOP) in Pogona vitticeps. Methods: Eighteen healthy, captive Pogona vitticeps of both sexes, average age of 10.6 months (range 20–49 months) were enrolled in the study. All animals underwent a physical examination, a basic clinical examination, an ophthalmic examination, a direct ophthalmoscopy and indirect ophthalmoscopy with 78-diop-
ter lens were performed in both eyes. Tear production was measured by the Phenol Red Thread test (PRTT) (PRTT) (O. IOP was bilaterally assessed by rebound tonometry (Tonovet®)). Ocular examination parameters were evaluated immediately after each examination of each animal. The coexistence of these factors in a conjunctival mass is one of the leading causes of conjunctival and eyelid disorders. The most common cause of conjunctival masses is chronic inflammation, which may be due to a combination of factors, including bacterial, fungal, and viral infections. Conjunctival masses can also be caused by ocular foreign bodies, neoplasms, and autoimmune processes. In the present study, we aimed to evaluate the clinical and histological characteristics of conjunctival masses in cats and to determine the most common causes and treatment options.

P OTER 19
3rd eyelid conjunctival sequestrum in two cats
E Fenollosa-Romero,* S Stavinoha,* S Mazzucchelli† and D Nuthrow-Hughes†
*Eye Eye Clinic, Bradley Stoke, Bristol, UK; †Ophthalmology freelancer, Turin, Italy
Purpos e: A third eyelid conjunctival sequestrum was first described in a domestic shorthaired (DSH) cat and one domestic longhaired (DLH) cat is described. Methods: Case 1 (C1): 11 year old, male domestic shorthaired cat was presented with a conjunctival mass in the third eyelid and a conjunctival ulceration. Clinical and histological findings were compatible with a conjunctival sequestrum. The mass was excised and submitted for histopathology. A dog was presented with a conjunctival sequestrum in the third eyelid, which was excised and submitted for histopathology. The excised mass was submitted for histopathology. The excised mass was found to be an abscess with a necrotic center, which was consistent with a conjunctival sequestrum. The histopathological examination revealed a chronic inflammatory process with necrosis and granulation tissue. The case was managed with topical antimicrobials and corticosteroids. The patient was evaluated at the follow-up visit and the conjunctival sequestrum had resolved completely.

P OTER 17
Conjunctival papillary mastocytosis in cats
RR Dubielzig,* L Teixeira* and B Beckenholc†
*Comparative Ocular Pathology Laboratory of Wisconsin, the University of Wisconsin-Madison, WI, USA; †Queens West Los Angeles Animal Hospital, CA, USA
Purpo se: To describe fourteen cats that developed conjunctival mastocytosis characterized by papillary epithelial proliferation and reactive mast cells within the epithelium. Methods: A COPLow database was searched for cats diagnosed with ocular mastocytosis. Fifteen samples from fourteen cats were identified. Ocular specimens were stained with hematoxylin-and-eosin or Giemsa or Toluidine Blue. Results: Fourteen cats underwent excisional biopsy. Median age was 8 years (0.7–17) and sex or breed predilection were not noted. The nictitating membrane was affected in 10/14 cases. The median duration of a mass prior to excision was 4 months (range 0.7–17). Lesions were unilateral in 11/14 cats, 8/14 cats had coexisting corneal disease, and two cats had eosinophilic keratitis. Various topical and oral medications were administered before and following excision, including antibiotics, steroids, immune-modulators, NSAIDs, antihistamins and 1% fluorescein. Recurrence was documented in one cat, tacrolimus 0.02% was applied and the mass lesions regressed. Clinically and histologically, proliferative conjunctival masses were noted in all but one case. They were histologically characterized by a neutrophilic infiltrate with an abundance of mast cells, marked edema, and papillary epithelial hyperplasia with the presence of intraepithelial mast cells. Finally, the lesion was considered as a conjunctival mastocytosis, which is critical in making the diagnosis of papillary mastocytosis. Mast cells were confirmed with Giemsa or Toluidine Blue. Conclusion: Feline papillary mastocytosis is an uncommon non-neoplastic and non-inflammatory condition affecting the conjunctiva in cats. Etiology remains unknown, but a hypersensitivity reaction or feline herpesvirus-1 infection is implicated.

P OTER 18
Microbiota on the ocular surface of clinically normal cats - preliminary results
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*Small Animal Clinic, Faculty of Veterinary Medicine, Freie Universit at Berlin, Germany; †LABOKLIN, Labor für klinische Diagnostik GmbH & CO.KG, Bad Kissingen, Germany
Purpos e: The ocular microbiota although dependent on the environment and climate has not yet been described for cats in Europe. Therefore the aim of this survey was to determine the microbiota from conjunctival swabs of clinically healthy cats. Methods: Conjunctival samples (n = 170) were collected bilaterally from 85 healthy cats randomly using a sterile cotton-tipped or dry swab. Samples were taken at the time of a physical examination. Slit-lamp biomicroscopy and indirect ophthalmoscopy with 78-diop-
ter lens were performed to exclude any pigmented third eyelid mass. Although rare, conjunctival sequestrum should be considered in the differential diagnosis of such cases. The excised mass was submitted for histopathology. The excised mass was found to be an abscess with a necrotic center, which was consistent with a conjunctival sequestrum. The histopathological examination revealed a chronic inflammatory process with necrosis and granulation tissue. The case was managed with topical antimicrobials and corticosteroids. The patient was evaluated at the follow-up visit and the conjunctival sequestrum had resolved completely.

Conjunctival masses in cats are often difficult to diagnose and treat. They can be caused by a variety of conditions, including bacterial, fungal, and viral infections, as well as chronic inflammation and neoplasms. The diagnosis and treatment of conjunctival masses in cats require a thorough evaluation of the patient, including a complete ophthalmic examination, histopathological evaluation of the excised mass, and appropriate antimicrobial therapy. The presence of multiple causes and the variable response to treatment emphasize the need for a multidisciplinary approach to the management of these cases.
POSTER 20
Safety and tolerance of intravitreal mesenchymal stem cells in pigmented rabbit eyes
I Fernandez-Bueno,*, S Labrador-Velandia,†,‡ S Di Lauro,*,† ML Alonso-Alonso,*, S Tabera Bartolome,*, GK Srivastava,* and JC Paule†
*Instituto Universitario de Oftalmobiología Aplicada (IOBA), Universidad de Valladolid, Valladolid, Spain; †Centro en Red de Medicina Regenerativa y Terapia Celular de Castilla y León, Valladolid, Spain; ‡Department of Ophthalmology, Hospital Clínico Universitario, Valladolid (HCUV), Spain

Purpose: To evaluate the safety and tolerance potential of intravitreally injected mesenchymal stem cells in pigmented rabbit eyes, by ophthalmic follow-up and histopathological evaluation. Methods: The use of animals in this study was in accordance with the ARVO Statement for the Use of Animals in Ophthalmic and Vision Research. Mesenchymal stem cells used in this study (MSV, Cisopin SL, Valladolid, Spain) are approved for clinical use by the Spanish Drug Agency. Twenty-four rabbits (Rex Chinchilla–NZW) were randomised into six groups of 4 animals. Groups 1 and 4 received an intravitreal injection into the right eye of 1·5 × 10⁶ MSV, in 0·05 μL vehicle (Ringer-Lactato-based). Groups 2 and 5 received a similar injection of 0·75 × 10⁶ MSV. In Groups 3 and 6 (controls) only the vehicle was injected. Evaluation of anterior segment by slit-lamp, posterior segment by indirect ophthalmoscopy, and intraocular pressure by Tonopen was performed. Clinical signs were evaluated before MSV injection and weekly during 6 weeks. Clinical signs were graded and scored by the Hackett-McDonald method. Animals were sacrificed at 2 or 6 weeks, and the eyes were removed for protocols HE staining and histological evaluation. Results: Ophthalmic follow-up did not reveal clinical differences between control and MSV-injected groups at any time point evaluated. No pathological findings related to ocular, liver, spleen and gonads were noted in any group. Conclusion: Mesenchymal stem cells (MSV) are safe and well tolerated after intravitreal injection in pigmented rabbit eyes. This study reinforces the potential of cell therapy for eye diseases. Support: Centro en Red de Medicina Regenerativa y Terapia Celular and Grants V9316A12-2 and V9118U18, Junta de Castilla y Leon, Spain.

POSTER 21
Lacrimal gland ductal cyst, partial retinal detachment and pecus excavatum in a young Bengal cat
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Purpose: This report describes the clinical, histopathological, radiographic and echographic features of a Bengal cat in which epibulbar keratopathy, an enlarging conjunctival mass in the superotemporal fornix and a thoracic wall deformation were initial clinical signs. Methods: A 6-month-old, male Bengal cat was presented because of changes of the left eye. Ophthalmic and general physical examinations were performed. Ancillary diagnostic procedures included biopsy of the conjunctival mass, radiographic and echographic examination of the thorax and complete blood count. The conjunctival mass was dissected from the surrounding tissue and excised, leaving the bulbus and eyelid intact. The removed tissue was submitted for histopathology. Results: Ophthalmic examination of the left eye revealed epibulbar keratopathy, a conjunctival mass was dissected into the bulbar conjunctiva and a small, transparent, blood-filled cyst was found at a distance of 1·5 cm from the limbus. Conjunctival biopsy revealed a severe chronic supplicative inflammation. During general physical examination a deformity of the thorax was identified and a 1·5 cm breast bone was observed 1·5 cm away from the left mammary gland. On chest radiographs other than a displacement of the heart to the left, ultrasound examination was unremarkable. Further diagnostics and a histological examination of the removed tissue revealed a cyst of the lacrimal gland (LG) with a small, transparent, blood-filled cyst. Conclusion: LG cysts are rare in cats but must be considered in the differential diagnosis of conjunctival mass lesions. Support: Tieraugendoc, Nestelbach, Austria.

POSTER 22
Bilateral bulbar keratopathy secondary to bacterial ulcerative keratitis in a 3-month-old Suri alpaca (Vicugna pacos)
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Purpose: To describe the clinical, histopathological and biomicroscopic aspects of bilateral bulbar keratopathy secondary to Staphylococcus spp. ulcerative keratitis in a 3-month-old alpaca. Methods: Complete ophthalmic examination, corneal cytology, bacterial/fungal cultures, and histologic examination of the affected cornea was performed. Results: A 3-month-old female alpaca was referred for delay growth and a 2-week history of dysorexia. Based on clinical abnormalities, a systemic viral infection was primarily considered but all testing had negative results. Bilateral extensive corneal ulcerations were observed 1 days after admission (groups II and III). Non-cultured corneal limbal tissues (group IV, n = 6) were used as control. Samples were sectioned at 8 μm and stained with hematoxylin and eosin. Conclusions: Corneal pathology examination of the mass yielded a lacrimal gland ductal cyst with pyogranulomatous inflammation. Follow-up revealed a good functional result and no recurrence after 6 months after cyst removal. Conclusion: Lacrimal gland ductal cysts are rare in cats but must be considered in the differential diagnosis of conjunctival mass lesions.

POSTER 23
Ocular cases evaluated by the equine clinic of the veterinary faculty, Szent István University over 5 years
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Purpose: To describe the equine cases evaluated by the Ophthalmology Service at the Equine Clinic over a 5 year period. Methods: In this retrospective clinical study records of all equine patients examined by the Ophthalmology Service were reviewed. Results: The Equine Clinic evaluated 1331 equine patients from January 2010 to December 2014. We examined 111 of those patients for ocular abnormalities during 163 visits (46.5%). Diagnoses on initial examination were as follows: 33 (25.1%) corneal ulcerations of which 27 were infectious or melting, 6 were indolent, 13 (9.9%) corneal perforations, 9 (6.8%) non-ulcerative keratits, 4 (10.5%) viral keratitis, 24 (18.3%) unilateral and 6 (4.5%) bilateral uveitis, 5 (18.8%) unilateral and 3 (12.2%) bilateral conjunctivitis, 6 (4.5%) cataracts, 5 (3.8%) squamous cell carcinoma (eyelid, conjunctival, or corneal), 5 (18.8%) eyelid lacerations or abscesses, 12 (2.2%) endophthalmitis, 2 (1.5%) bilateral retinal degenerations. Other abnormalities, including anterior segment dysgenesis, asteroid hydrol, corneal dermoid, corneal foreign body, eyelid scarring, glaucoma, retrobulbar neoplasm, traumatic iridocorneal effusion (TIE) were diagnosed in 26 patients. This cat was formed under general anesthesia: different corneal surgeries, cycloplegmin injections, enucleations, and 27 surgeries in standing: eyelid surgeries, keratomections, enucleations, simmons trephination. Conclusion: The overall diagnosis revealed diffuse bilateral uveitis. Support: The Equine Clinic visits. Ocular lesions (49.6%) and uveitis (22.9%) were most commonly diagnosed. We had an increasing number of patients and standing surgeries year by year. Other common problems, such as eyelid sarcomas are rarely evaluated, possibly as a result of improved treatment by ‘field’ veterinarians.

POSTER 24
Molecular order of stromal proteoglycans as revealed by linear dichroism in rabbit corneal limbal explants cultured ex vivo
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Purpose: Evaluate changes in the molecular ordering of stromal proteoglycans (PGs) in corneal explants cultured ex vivo. Methods: Five (n = 5) limbal explants cultured for different periods. PGs are important extracellular regulators of cell differentiation. Methods: The study protocol adhered to the ARVO guidelines and the Helsinki declaration. Ralbit limbal explants (n = 18) were cultured on human dermal amnion (hDA) for 7 (n = 3), 14 (n = 2), seven (n = 2) and 42 days (n = 1). Non-cultured corneal limbal tissues (group IV, n = 6) were used as control. Samples were collected at 8 μm and stained with hematoxylin and eosin. Conclusions: Corneal pathology examination of the mass yielded a lacrimal gland ductal cyst with pyogranulomatous inflammation. Follow-up revealed a good functional result and no recurrence after 6 months after cyst removal. Conclusion: Lacrimal gland ductal cysts are rare in cats but must be considered in the differential diagnosis of conjunctival mass lesions.

Results: Ex vivo corneal explants were aged for different periods. PGs’ linear dichroism (LD) were calculated using the formulas AGPA/C6 = 11.13, seven (1296.00 ± 1.15), and 15 days (1290.80 ± 1.15), P = 0.00. LD and DR values were respectively 19.71 and 0.99 for group I, 0.62 and 0.99 for group II, 28.49 and 0.97 for group III, 25.19 and 0.98 for group IV, and 0.62 and 0.99 for group IV. Conclusion: Cell culture promotes remodeling of limbal extracellular matrix and spatial-temporal alterations in molecular ordering of stromal PGs. Support: CAFES, CNPq (Proc. 300813/2010-5 and 467289/2014-0), and FAPESP (Proc. 2013/04494-7 and 2013/ 2551-3).

POSTER 25
Effects of firocoxib on aqueous humor prostaglandin F₂α levels for controlling experimentally-induced anterior uveitis in healthy and Toxoplasma GONDII-seropositive cats
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Purpose: To evaluate the effects of firocoxib for controlling experimentally-induced anterior uveitis in healthy and Toxoplasma gondii-seropositive cats. Methods: Thirty two cats with no ocular abnormalities based on slit lamp biomicroscopy, applanation tonometry, and ophthalm-
POSTER 26
Eye blink rate, tear production, and corneal sensitivity in Australian shepherd dogs
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Purpose: The aim of this study was to measure the eye blink rate, tear production, and corneal sensitivity in adult Australian Shepherd dogs.

Methods: Ten healthy Australian Shepherd dogs were treated (TF, TP, TH) and a control group (CE, CH). The eye blink rate (EBR) was obtained using a video camera and the original video images of each dog’s eyes were captured during 1 min and represented a counting of the eyelid movements (complete and incomplete blinks). Tear production was measured with the Schirmer tear test 1 (STT1). The central corneal sensitivity was determined using the corneal touch threshold (CTT) with the Cochet-Bonnet aesthesiometer. The tests were performed in both eyes without instillation of anesthetic eye drops.

Results: In all dogs, there were no significant differences between the left and right eyes (P > 0.05). Sensitivity in the experimental group (TF and TP) was determined by evaluating the corneal touch threshold (CTT) with the Cochet-Bonnet aesthesiometer. The tests were performed in both eyes without instillation of anesthetic eye drops. The right eye was the eye examined in this study. These dogs were from the “Australian Shepherd Wind Spirit Kennel” (Sao Paulo, SP, Brazil) and all procedures were conducted with the consent of the owners.

Conclusion: The eye blink rate (EBR) and the tear production obtained with the Schirmer tear test 1 (STT1) were not statistically different between control and experimental dogs. The central corneal sensitivity was slightly higher in the experimental group (TF and TP) compared to control group (CE, CH).
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Purpose: Evaluate the growth and differentiation of rabbit corneal limbal epithelial cells grown on human denuded amniotic membrane (dAM), without air-lifting or 3T3 feeder layer. Methods: Corneal limbal epithelial cells (n = 8) were expanded on dAM monolayer for 14 days, an explant culture technique was used. Cell migration and growth were evaluated daily by phase contrast microscopy. Histological examination was performed following hematoxylin and eosin staining. Antibodies against the cytokertatin pan 3/12 and p63 were used to detect corneal differentiated and progenitor cells, respectively. The Feulgen reaction was performed to study the nuclear geometry (area and Feret ratio). Material was evaluated under an optical microscope (Eclipse E2000, Nikon) equipped with a 40× objective, video camera and image analysis software (Image J). Results: Cell migration was observed at 7 days of culture. The mean cell growth area 14 days after culture was 302.06 ± 40.08 pixels² (n = 30), and the Feret ratio was 1.03 ± 0.14, respectively. The mean Feret ratio was 1.03 ± 0.14, respectively, compared with progenitor cells (27.87 ± 8.11 pixels² and 1.03 ± 0.14, respectively). Conclusions: LEPCs grown on dAM showed reduced IOD values (14.62 ± 5.92). LEPCs grown on iAM and dAM showed reduced OD values (0.51 ± 0.008). IOD and OD were significantly lower between LEPCs grown on iAM or dAM and controls (P < 0.001 and P < 0.0001 respectively). Statistical difference was found between d1 [IOD: F(1, 8) = 0.003, P = 0.940] and area [F(1, 8) = 0.0001] and between control group and DM and between control group and CKD [IOD: F(1, 8) = 0.003, P = 0.940 and area [F(1, 8) = 0.0001]]. Conclusions: LEPCs grown on dAM had a higher degree of differentiation than LEPCs grown on iAM. Further research is needed to develop feline-optimised automated retinal imaging analysis. Clinical significance of retinal vascular geometry parameter differences found in cats with CKD and DM is unknown.
tinning of the eyelid hairs was restored. Patients were discharged the same day and treated with atropine for 4 days. Results: 15 dogs were treated. No local nor systemic side effects were observed in the early postoperative period and all patients showed complete remission of disease. Follow-up ranged from 1 to 2 years. Conclusion: This minimally invasive yet highly effective technique shows promising results and this study is ongoing. Therefore the aim of the study was to examine diabetic cats for ocular changes.

Methods: In this prospective study cats with D.m. underwent a complete ophthalmic exami-
nation. Patients’ signalment, laboratory test results and the time since diabetes was diagnosed were recorded. Statistical analysis was performed using the Student's t-test for comparison of means. Results: In 400 cats). It is known to cause ocular changes in various species, among which osmotic cataracts and retinopathies are most common. Cats are reported to be almost resistant to diabetic cataract formation and only few case reports of feline diabetic retinopathy are published. This study includes 188 feline diabetic patients. Inclusion criteria were: feline diabetes mellitus, age 1 year or older, appropriate lab results for diabetes management, and complete ophthalmologic examination. Retinoscopic and Slit lamp examination were performed for all cats to evaluate the presence of diabetic retinopathy and cataracts. Results: Of the 188 feline diabetic patients, 20 were found to have diabetic retinopathy and 16 had diabetic lens opacities. Conclusion: There is a need for further research to determine the exact prevalence of diabetic retinopathy in cats with diabetes mellitus. The results of this study suggest that diabetic retinopathy and cataracts are common in diabetic cats and further research is needed to determine the incidence and severity of these complications.

POSTER 41

Effect of exercise on intraocular pressure (IOP) in dogs

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Purpose: To investigate changes in intraocular pressure (IOP) during exercise in dogs. Material and Methods: 12 healthy dogs of different breeds, with an average age of 2.9 years and an average body weight of 14.1 kg, underwent an exercise test on a motorized treadmill (pro-
cedural treadmill). Procedure: Exercise test. Results: Significant differences in IOP were observed. Immediately after exercise, the mean IOP was 12.69 mmHg in OD and 11.71 mmHg in OS. In the control group (T0) the mean IOP was 12.86 mmHg in the right eye (OD) and 13.57 mmHg in the left eye (OS). Immediately after exercise (T1) the mean IOP was 12.66 mmHg in OD and 11.71 mmHg in OS. After the exercise test, (T2) the mean IOP was 11.69 mmHg in OD and 11.84 mmHg in OS. Conclusion: Most changes in IOP were not significant immediately at the end of the exercise (P > 0.05), but after exercise, significant changes were observed in both the eyes (P < 0.05).

POSTER 42

Ocular biometry of capuchin monkey (Cebus apella)

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Purpose: The aim of this study was to determine the ocular dimensions of capuchin monkeys by A-mode ultrasonography and keratometry, and to determine the refractive power of the crystalline lens (IOL) employing formulas to calculate the lens power. Methods: Eighteen adult monkeys (16 eyes) of Cebus apella species were used. Experimental procedures were approved by Ethical Committee for Animal Experimentation (CEEA) of the Veterinary Teaching Hospital of State University of Mato Grosso. Blood samples were taken for complete blood count and serum biochemistry. The average refractive power of the crystalline lens was determined using the Holladay 1, 2 and 3 formulas. Results: The average refractive power of the crystalline lens for monkeys was: 34.00 ± 5.20 D, 33.75 ± 4.75 D and 33.20 ± 4.20 D for the Holladay 1, 2 and 3 formulas, respectively. Conclusion: The refractive power of the crystalline lens for capuchin monkeys was determined using the Holladay 1, 2 and 3 formulas. The results showed that the refractive power of the crystalline lens for Cebus apella monkeys was similar to that of humans, indicating that capuchin monkeys can be used as a model for studying the behavior of the crystalline lens under different conditions.
POSTER 45

Effect of deep selenectomy for experimentally induced ocular hypertension in dogs

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Purpose: To evaluate the effect of deep selenectomy (DS) on intraocular pressure (IOP) in dogs with experimentally induced ocular hypertension.

Methods: Under general anesthesia, DS was performed on the right eye (DS-group) of 9 clinically normal beagle dogs. After the sclera was incised, a one-third thickness circular based superficial 5 × 5 mm scleral flap was dissected. A deep 4 × 4 mm scleral flap was dissected leaving a thin layer of sclera over the choroid. Once the discoloration burred through the tissue, the flap was repositioned and sutured with 10.0 nylon. The left eye of each dog was included as control.

Results: Postoperative complications and IOPs were evaluated after surgery. Ten days after surgery, both eyes were examined. There were no postoperative complications in any eye. In the DS-group, IOP was significantly lower compared to the control (P = 0.01). The DS had IOP-lowering effect on experimentally induced ocular hypertension with few immediate postoperative complications.

POSTER 46

Superior orbitectomy in a dog with frontal sinus squamous cell carcinoma

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Purpose: To describe the effect of vision-sparing superior orbitectomy in a Small Munsterlander with frontal sinus squamous cell carcinoma (FS-SCC), which has invaded the orbit.

Methods: A 9.5-year-old, female spayed Small Munsterlander (body weight 14 kg) was pre-sented with a 1-month history of swelling of the right zygomatic arch. Computed tomography of the skull revealed a space-occupying mass. The right maxillary sinus was opened and brown aspirated fluid revealed the presence of numerous inflammatory cells without the presence of subtleto marked enhancement of the oculomotor nerve in nine cases. MRI was used to rule out a neoplastic mass. MRI revealed the presence of subtle to marked enhancement of the oculomotor nerve in nine cases. MRI was used to rule out a neoplastic mass.

Results: The tumor was resected radically by using a dorsal approach. Postoperative complications were mainly mild conjunctival hemorrhage and disappeared in 3 days with topical-steroid antisepsis. Postoperative IOP of the DS-group was not significantly different from control and preoperative IOP, respectively. While inducing ocular hypertension, the IOP of the DS-group was significantly lower than that of the control (P = 0.01). Sixty minutes after infusion, the IOP values of DS-group and control were 45.7 ± 7.3 (mean ± S.D.) and 76.6 ± 9.2 mmHg, respectively. Conclusion: The DS had IOP-lowering effect on experimentally induced ocular hypertension with few immediate postoperative complications.

POSTER 47

Unusual epithelial inclusion cyst of the zygomatic arch in a horse

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Purpose: To describe a case of an unusual epithelial inclusion cyst of the zygomatic arch in a horse.

Methods: A 12-year-old Belgian Warmblood was presented for subcutaneous swelling of the right zygomatic region of 1 month’s duration. Ophthalmic examination was unremarkable. Ultrasound examination demonstrated an anechoic, cyst-like lesion lateral to the orbit consistent with a cyst or an abscess. Cytologic examination of the dark brown aspirated fluid revealed the presence of numerous inflammatory cells without the presence of infectious organisms. Further work-up was declined by the owner. The horse was reevaluated 2 months later because of recurrence and worsening of the swelling associated with mild exophthalmos. Results: Computed tomography of the skull revealed a space-occupying mass originating from the right frontal bone zygomatic process, extending through the temporal bone zygomatic process ventral to the globe in the zygomatic bone, and cephalad to the right maxillary sinus. Soft tissue expansile mass of the zygomatic arch was observed and mild exophthalmos was confirmed. Total cyst excision was performed leaving a communication with the right maxillary sinus. Histological examination revealed a cyst lined with non-keratinizing epithelium in contrary to previously reported cases. Recovery was uneventful. No recurrence was observed within a 5-month follow-up period.

Conclusion: The etiology of this cyst remains inconclusive. Conclusion: We report the successful surgical cure of an epithelial inclusion cyst of the zygomatic arch in a horse which origin differs from previously reported frontal bone cysts.

POSTER 48

Pharmacokinetics of topical and intravenous administered atropine in the horse – a pilot study

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Purpose: To investigate the plasma concentration and terminal half-life of atropine sulphate after intravenous injection and topical administration in a pilot study with one horse.

Methods: One mg of atropine sulphate was administered intravenously and topically to one healthy Swedish warmblooded trotter with a washout period of 1 week in between treatments. Jugal blood samples were taken 15 times in 5 h after treatment. Plasma concentrations were determined by high-performance liquid chromatography tandem mass spectrometry (UPLC-MS/MS) with a detection limit for atropine in plasma of 0.13 ng/mL. Pharmacokinetic parameters were determined by noncompartmental analysis. A clinical examination was performed every 1 h and the horse was continuously monitored for signs of colic. Results: The plasma concentration of atropine 10 min after intravenous injection was 0.2 ± 0.1 µg/mL at the terminal half-life. The plasma levels of atropine were below detection limit 6 h after intravenous treatment. The plasma concentration of atropine at topical administration could not be determined. The plasma concentration of atropine was determined to be 61 µg/mL and plasma levels of atropine were below detection limit 5 h after topical treatment. No colic signs were observed during the study in any of the treatments.

Conclusions: This pilot study indicates that the terminal half-life of atropine in plasma is approximately 1 h in the horse after topical administration. Further studies are needed to confirm the results and to draw conclusions regarding the clinical significance of the results, including the potential systemic effects of different treatment regimens.

POSTER 49

Unilateral ophthalmoplegia/opthalmoparesis associated with suspected oculomotor neuritis of unknown origin in 12 dogs

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Purpose: To examine whether a nutritional antioxidant blend can improve visual function in dogs with progressive neurological signs.

Methods: Cases presented to the AHT from January 1999 to July 2014 with suspected oculomotor neuritis were included. Cases with ophthalmoplegia/ophthalmoparesis (9/12) or only internal ophthalmoplegia (3/12). MRI revealed the presence of subtle to marked enhancement of the oculomotor nerve in nine cases. MRI was used to rule out a neoplastic mass. The clinical signs varied from 1 day to 2 years (mean 6.29 years). The duration of the clinical signs varied from 1 to 2 years (mean 2.29 years). Cases with ophthalmoplegia/ophthalmoparesis were included in the study.

Results: The study was performed in 12 dogs. Antioxidant supplementation increased retinal responses and decreased refractive error changes in dogs.

Conclusions: Suspected oculomotor neuritis of unknown origin should be included as a differential diagnosis in dogs presenting with unilateral ophthalmoplegia/opthalmoparesis. These cases have a good prognosis and clinical signs improve over time.

POSTER 50

Antioxidant supplementation increased retinal responses and decreased refractive error changes in dogs

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Purpose: To examine whether a nutritional antioxidant blend can improve visual function in healthy dogs as measured by electroretinography (ERG) and autofluorescence.

Methods: Twelve Beagles, 6–8 years of age, with normal eyes upon indirect ophthalmoscopy and slit lamp examination were included. Antioxidant supplementation was performed in 6 dogs. Dogs were treated with a nutritional antioxidant blend for 12 weeks. Antioxidant supplementation increased retinal responses and decreased refractive error changes in dogs.
POSTER 51
Morphological features of ocular inflammation and distribution of viral antigens in ocular tissues of cats with feline infectious peritonitis (FIP)
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Purpose: To evaluate immediate effects of diamond burr debridement (DBD) on the cornea and M Matas-Riera†
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To describe the innervation of the cornea in horses with no ocular abnormalities. Results: Corneas were dissected from globes in 1 h post mortem and fixed in 4% formaldehyde. Frozen sections were stained with rabbit anti-neurofilament and anti-tyrosine hydroxylase (TH). Binding of antibodies was evaluated using widefield fluorescence microscopy. Series of optical sections were stacked to construct 3D images of corneal innervation patterns. Results: Nerve fibers and fiber bundles presented as β-tubulin-immunoreactive in three major corneal layers: corneal stromal nerves, a subepithelial nerve plexus and a subbasal nerve plexus. The strongest stromal nerves were more abundant in the anterior stroma. TH-immunoreactive fibers were found in the subepithelial stroma in medium-sized bundles but absent in the corneal epithelium. Conclusion: The results demonstrate for the first time the normal innervation pattern in the equine cornea using immunofluorescent labeling. The architectural features of horse corneal innervation closely resemble those reported for other mammals. The results of this study will serve as baseline data for assessing changes in corneal innervation in cases of equine corneal disease.

Resident 1
Immediate effects of diamond burr debridement in patients with spontaneous chronic corneal epithelial defects; light and electronmicroscopic evaluation
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Purpose: To evaluate immediate effects of diamond burr debridement (DBD) on the cornea of canine patients diagnosed with spontaneous chronic corneal epithelial defects (SCCEDs). Methods: Nine eyes from eight client-owned dogs with SCCEDs underwent superficial keratectomy. Two of four quadrants underwent DBD for 40 s each. The remaining quadrants were fixed with glutaraldehyde 2.5% and underwent transmission electron microscopy (TEM). The pathology was masked to the samples. Student’s paired t-tests were used to analyse the data. This study was approved by the Royal Veterinary College Ethics Committee. Results: With LM all non-burred samples had a superficial keratopathy (SC). DBD resulted in an inter mittent HAZ and in two burred samples this zone was absent. The HAZ thickness of burred samples (1.062 ± 0.604 μm) was significantly thinner than that of the non-burred samples (4.309 ± 1.484 μm) (P < 0.001). TEM showed an absence of basement membrane and the presence of an amorphous, fine fibrillar material in the superficial stroma in non-burred samples (P < 0.05), but not in burred samples. TEM analysis demonstrated that DBD significantly reduces the superficial stromal HAZ in SCCEDs, which is believed to interfere with the healing of these defects. Conclusion: DBD supplementation to the company provided financial support in the form of a grant to fund the evaluation of histopathology samples.

Resident 2
Morphology of horse corneal innervation
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Purpose: To describe the innervation of the cornea in horses with no ocular abnormalities. Methods: Corneas were dissected from globes in 1 h post mortem and fixed in 4% formaldehyde. Frozen sections were stained with rabbit anti-neurofilament and anti-tyrosine hydroxylase (TH). Binding of antibodies was evaluated using widefield fluorescence microscopy. Series of optical sections were stacked to construct 3D images of corneal innervation patterns. Results: Nerve fibers and fiber bundles presented as β-tubulin-immunoreactive in three major corneal layers: corneal stromal nerves, a subepithelial nerve plexus and a subbasal nerve plexus. The strongest stromal nerves were more abundant in the anterior stroma. TH-immunoreactive fibers were found in the subepithelial stroma in medium-sized bundles but absent in the corneal epithelium. Conclusion: The results demonstrate for the first time the normal innervation pattern in the equine cornea using immunofluorescent labeling. The architectural features of horse corneal innervation closely resemble those reported for other mammals. The results of this study will serve as baseline data for assessing changes in corneal innervation in cases of equine corneal disease.

Resident 3
Comparison between handheld rebound tonometry (TonoVet®) and applanation tonometry (TonoPen®) in healthy guinea pigs: feasibility according to age
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Purpose: To compare intracocular pressure (IOP) measurements obtained by rebound tonometry (TonoVet®) and applanation tonometry (TonoPen®) in healthy guinea pigs of different ages. Methods: Fifty-two healthy guinea pigs (Cavia porcellus) with normal ophthalmic examination were included in the study (104 eyes). Animals were divided into two groups according to age: young (29 animals; 4 weeks-old) and adults (75 animals; 36 months, 36 months; 36 months, 23 animals). Twenty-two adult pig eyes were obtained at a local veterinary slaughterhouse. The intraocular pressure was measured with TonoVet® and TonoPen®. The mean pressure was measured with four replicates for each eye. Results: Mean IOP readings were as follows: 11.20 ± 1.83 mmHg (adults with TonoVet®) 10.93 ± 1.63 mmHg (adults with TonoPen®) and 8.53 ± 1.28 mmHg (young with TonoVet®). TonoPen® readings could not be obtained in young animals. Significant differences were observed between both tonometers in adults (P < 0.05), and between ages with TonoPen® (P < 0.0001). No differences were seen between left and right eyes (P > 0.05), nor between genders (P = 0.05). TonoVet® readings were obtained faster than the TonoPen® ones (<1 min vs 3.38 ± 1.27 min, respectively (P < 0.0001)). Conclusion: The TonoPen® rapidly establishes normal rebound tonometry values for young and adult Guinea Pigs, and demonstrates that TonoVet® tonometry is a rapid and well-tolerated procedure feasible in Guinea Pigs at any age. TonoVet® significantly overestimates TonoPen® IOP values in adult Guinea Pigs.

Resident 4
Feasibility of descemet stripping endothelial keratoplasty in pig eyes: an animal eye model
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Purpose: To evaluate the suitability of the porcine eye for Descemet stripping endothelial keratoplasty (DSEK) training. Methods: Twenty-two adult pig eyes were obtained at a local slaughterhouse. An anterior segment examination was carried out and DSEK was performed as previously described. Surgeries were recorded, and the execution of the surgery was evaluated. Results: Peared corneal tissues were fixed in 10% formaldehyde, paraffin-embedded, sectioned and stained with hematoxylin-eosin. Thickness of the stromal remnants was measured and quantified, and the Descemet membrane (DM) and endothelium were assessed. Conclusion: All DSEK procedures were performed in <10 min. DM was peeled away with no incidences in 18 eyes (82%). In 4 eyes (18%) DM was firmly attached to the overlying stroma, hindering the stripping and inducing peeling away of the DM in fragments. Scant stromal remnants were present in all the DSEK samples, ranging in thickness from 11.86 to 279.76 μm (mean 88.1 μm). While sparse endothelial remnants were only seen in 3/22 eyes (22%), DM was observed in all the samples (22/22; 100%). M11 stromal edema was seen in all the samples thicker than 16 μm. Conclusion: DSEK is a technically demanding surgical technique feasible in pig eyes. The amount of stromal remnants obtained is similar to those described in human ophthalmology. The pig model can be used for surgical training in DSEK, thereby reducing the incidence of several potential complications associated to the significant learning curve of this technique.
Residents 5

Characteristics of pulverulent nuclear cataracts in the Norwegian buhund breed
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Purpose: To describe prevalence and progression of pulverulent nuclear cataracts (PNC) in Norwegian Buhunds in Norway. Method: Between January 2009 and September 2014 169 Norwegian Buhunds were screened for presumed inherited eye disease. Thirty-six dogs were examined on more than one occasion (2–6), resulting in a total of 232 examinations. Age at the time of examination ranged from 10 weeks to 15 years with a median age of 4.7 years at the first examination, and 5.6 years at the last examination. Seventy-nine dogs (46.75%) were male and 90 (53.25%) were female. All examinations were performed by the same person (EOR). PNC were categorized as minimal, mild, moderate or pronounced. Results: A total of 94 dogs (55.6%) were found to be affected by PNC at their last examination. Of these, 29 (30.9%) had minimal, 19 (20.2%) had mild, 27 (28.7%) had moderate, and 19 (20.2%) had pronounced PNC. Of 42 dogs examined before the age of 2 years, only 10 (23.8%) had PNC, all of which were minimal. The majority of re-examined dogs that had minimal or mild PNC at their first examination demonstrated gradual progression of PNC, but at highly variable rates. Five dogs that were free of PNC at early examinations (age 1.1–6.2 years) developed PNC at later stages. Conclusion: PNCs were found in 94 of 169 Norwegian Buhunds. The rate of progression was unpredictable, and the condition was not always detectable at young age.