Abstracts: Annual Meeting of the European College of Veterinary Ophthalmologists/European Society of Veterinary Ophthalmologists, Copenhagen, Denmark, June 3–7, 2009

ABSTRACT NO.: 01
Effect of intermittent light on the photoreceptor cells of the retina in rabbits
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Purpose: The objective of the present study was to determine the histological change of the photoreceptor layer in male rabbits, which were exposed to intermittent light with different intensity.
Methods: Twelve 6-month-old New Zealand White male rabbits were randomly divided into three groups of control (CON), experimental group 1 (EXP-1, and experimental group 2 (EXP-2). The rabbits in each group were exposed to intermittent light (3 h/3 h of dark/light) with a 60 or 200-fluorescent bulb, respectively. The eyes of the rabbits were removed, routinely fixed and studied by transmission electron microscope.
Results: In Rabbits exposed in control group, the outer limiting membrane was detected in the outer nuclear layer and in the outer plexiform layer. In the EXP-1 group, shorted ultrastructure damage was detected. The nuclei were deformed and the chromatin was pyknotic. The outer segment of the photoreceptor was distorted in the EXP-2 group. In the EXP-2 group, the outer limiting membrane was absent in some site and swelling and pyknotic nuclei were existed.
Conclusion: These observations suggest that intermittent light with high intensity rather than low intensity causes more damages in photoreceptor layer of the retina.

ABSTRACT NO.: 02
Ultrastructural and histomorphometrical study of retinal pigment epithelium of the retina in cats under the effect of continuous light exposure and dark adaption
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Purpose: The aim of the study was to evaluate the morphometry and ultra structure of the retinal pigment epithelium layer after continuous light exposure and dark adaption in domestic female cats.
Methods: Twenty four healthy adult cats were divided into three groups: control, continuous light exposed, and continuous dark adapted groups. Bright light intensity measured with a power meter, was 500–600 lux. The eyes of animals were routinely fixed and studied by electron and light microscopy.
Results: In the control group, the nuclei of pigment epithelium layer was round and pyknotic. Mitochondria, golgi apparatus and rough endoplasmic reticulum increased in the light exposed group. In comparison with control and dark adapted groups (P<0.05), Mitochondria, golgi apparatus and rough endoplasmic reticulum increased in the light exposed group.
Conclusion: Our findings have confirmed that high cell activity occur in cat retinal pigment layer under the effect of 24 h continuous light.

ABSTRACT NO.: 03
Congenital day blindness in sheep: Behavioral, electrophysiological, anatomical and genetic investigation of a new disease
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Purpose: To study a sheep herd in which congenital impaired day vision was reported.
Methods: Epidemiology of the herd was studied through breeding records. Six affected lambs and six age-matched controls (mean age 4.2 months) were selected for detailed investigation. The objective of the present study was to determine the histological change of the photoreceptor layer in male rabbits, which were exposed to intermittent light with different intensity.
Results: In the control group, the outer limiting membrane was detected in the outer nuclear layer and in the outer plexiform layer. In the EXP-1 group, shorted ultrastructure damage was detected. The nuclei were deformed and the chromatin was pyknotic. The outer segment of the photoreceptor was distorted in the EXP-2 group. In the EXP-2 group, the outer limiting membrane was absent in some site and swelling and pyknotic nuclei were existed. Conclusion: These observations suggest that intermittent light with high intensity rather than low intensity causes more damages in photoreceptor layer of the retina.

ABSTRACT NO.: 05
Ophthalmic and cone-derived electrodiagnostic findings in outbred miniature Long-haired dachshunds homozygous for the rpgrip1 mutation
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Purpose: To investigate ophthalmic and cone-derived electrodiagnostic findings in outbred miniature Long-haired dachshunds (MLHD), homozygous for a mutation in the RPGRI1 gene previously associated with cone-rod dystrophy 1 (cord1). Methods: Thirty six MLHD homozygous for the RPGRI1 mutation (mean age 5.28 ± 2.14 years) and 25 dogs clear of the mutation (mean age 3.94 ± 2.81 years) underwent ophthalmological examination and cone-derived ERG recordings, including four high intensity light stimuli (3 cd/m²/sec) at a rate of 5.1 Hz, followed by cone b flicker responses at 10 Hz (3 cd/m²/sec). T-tests for independent samples were used to compare the measurements. Results: Findings on ophthalmological examination included diastasia in 9 of 23 control dogs and 16 of 36 affected dogs. In the control group three dogs presented with one of the following: a small coloboma of the retinal pigment epithelium, a persistent hyperplastic tunica vasculosa lentis (PHTVL) and a mild radial pattern of tapetal hyperreflectivity. In the affected group one dog presented with bilateral symmetric retinal atrophy at well as iris atrophy, corneal oedema and anterior hyaloid in the OD. Small focal choroid retinae was present in the tapetal fundus of four dogs. One dog each presented with iris atrophy, PHTVL and a diffuse, mild hyperreflectivity of the peripheral tapetal fundus. ERG recordings were available in 23 control dogs and 54 affected dogs. The b-wave amplitudes of the 30 Hz b flicker were significantly different with clear dogs having larger values on average. Age did not significantly affect the difference. Conclusion: Hyperreflectivity at the RPGRI1 mutation does not invariably result in early onset cord1. However cone derived ERG recordings show evidence of a relatively reduced cone function in homozygous but clinically normal MLHD. Modifying genes that have yet to be identified may enhance an in-bred dog's risk of developing the binding cord1 and also the age of onset and rate of progression. Support: Kennel Club Charitable Trust, Animal Health Trust residents fund.

ABSTRACT NO.: 06
Gonioscopic, ultrasound biomicroscopic, light and scanning electron microscopic imaging of a diffuse iris melanoma in a cat
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Purpose: This study aims to provide original imaging of a diffuse iris melanoma in a cat through gonioscopy, ultrasound biomicroscopy (UBM), light microscopy (LM), and scanning electron microscopy (SEM). Methods: An 11-year-old female cross-breed cat was presented with a progressive lowering of the visual acuity over several weeks. The cat had not received any treatment prior to presentation. Complete ophthalmic examination, gonioscopy and UBM were performed. Results: On clinical examination there were no obvious signs of ocular pain. Vision testing resulted to be normal. The OD had a slightly D-shaped pupil but appeared otherwise normal. The left iris showed a reverse D-shaped pupil and a severe ‘caxis-like’ hyperpigmentation. On that side, fundus examination and IOP were normal, but gonioscopy showed dramatic hyperpigmentation of the ICA, and UBM revealed an important thickening of the iris root and filling of the ciliary cleft. The origin of the dyscia of OU was unidentified. Although differential diagnosis included iris nevus and senile pigmentation, the most likely diagnosis was diffuse iris melanoma (DIM). Due to the potential risk of metastasis and despite the eye was visual, a transconjunctival enucleation was performed. The globe was fixed in formalin and cut in half along the sagital axis. One half was routinely processed for histopathologic examination and the other half was prepared for a scanning electron microscope evaluation. The diagnosis of DIM was histologically confirmed with transillumination of the iris, ciliary body, pectinate ligament, uveal and corneoscleral trabecular meshworks. Emboli were not visible. SEM examination showed that melanocytes invade the iris surface, presenting light, fenestrated, corneoscleral portion of the ciliary cleft, ciliary emboli. Emboli were visible in the scleral function in affected animals. Ophthalmic examination, including funduscopic evaluation, was unremarkable. Histologic and immunohistochemical evaluation of affected retinas revealed the physical presence of both red–green and blue cones in large numbers, suggesting that the behavioral day blindness and reduced cone ERGs reflect cone dysfunction rather than severe cone photoreceptor loss. Affected lambs were homozygous for a single nucleotide substitution in the CNGA1 gene, changing amino acid R216 to a stop codon. Conclusion: Our results show that a mutation in the ovine CNGA1 gene causes impaired daytime vision and diminished cone function in sheep while cone photoreceptors are histologically present in large numbers. We propose that affected sheep can serve as a naturally-occurring large animal model for human achromatopsia, including the study of gene therapy for this disease.

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venuous plasm. Unfortunately, the cat was unavailable for follow-up examinations 18 months after surgery; therefore, the existence of organ metastasis was not investigated. Conclusion: This case-report provides an original iconography of a diffuse iris melanoma in cats. To the authors' knowledge, this is the first detailed illustration of this disease. The causative behavior is unknown. Support: This work was supported by the Société Française d’Études et de Recherches en Ophthamologie Vétérinaire (SFEROV) and by Urgent.

ABSTRACT NO.: 07

Results of virus isolation, immunohistochemistry and response to antiviral therapy in cats suspected of having viral conjunctivitis

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Purpose: To evaluate the results of virus isolation, conjunctival histopathologic appearance; immunohistochemical staining results and response to therapy in cats suspected to have viral conjunctivitis. Methods: In a prospective study 30 cats (50 eyes) with conjunctivitis were evaluated. Conjunctivitis was categorized as acute (<2 weeks duration) or chronic (2 weeks or greater duration). Conjunctival swabs for virus isolation were collected from all 50 affected eyes. Conjunctival biopsy for histopathology and immunohistochemistry for FHV and FCV was collected from 24 cats (40 eyes). Brush cytology samples were collected from 17 cats (29 eyes). All the cats were treated with an ophthalmic antiviral agent and oral s.-lysin. All the cats were re-evaluated at least once (range 1–8 visits). If clinical resolution was not noted by the second recheck, topical ant-inflammatory agents were prescribed (bupropion or cyclosporine). Results: A range in age from 6 weeks to 14 years (mean 3.2 years). Fifteen cats (22 eyes) had acute and 17 cats (28 eyes) had chronic disease. Nine cats had been steaming. Virus isolation was positive for FHV in 13 of 24 eyes (68%) and for FCV in eight of 24 eyes (34%). Immunohistochemical stains for FHV and FCV were negative in all samplings. Histopathologic examination of biopsy samples showed conjunctival hemorrhages and, most importantly, immunohistochemical infections (in the submucosa of most samples. Viral inclusion bodies were not observed. Brush cytology samples typically included the same inflammatory cells as the biopsy samples. Twenty (12 eyes) cats were treated with antiviral therapy at the first or second recheck and 10 cats (18 eyes) did not improve with antiviral therapy alone and were treated with anti-inflammatory medication. Conclusion: Conjunctival immunohistochemistry was not helpful in diagnosing viral infections. Viral infection could be demonstrated in only 30% of eyes but the majority of cats improved with therapy, or in the case of FCV, on their own. Epithelial ulceration and response to treatment suggested a viral cause. Conjunctival histopathology was not helpful in identifying a non-viral negative virus isolation. Many cats required topical anti-inflammatory therapy for additional improvement or resolution of conjunctivitis.

ABSTRACT NO.: 08

Evaluation of a vessel-sealing device to assist in exenteration and extention in the horse

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Purpose: To describe and evaluate the use of the LigaSure TM, (Valleylab, Boulder, CO) for exenteration or exenteraion in the horse. The LigaSure is a feedback-controlled bipolar vessel removal using the LigaSure at The Clinique Desbrosse between April 2005 and March 2009 be helpful to assist eye removal.

Results: A range in age from 6 weeks to 14 years (mean 3.2 years). Fifteen cats (22 eyes) had acute and 17 cats (28 eyes) had chronic disease. Nine cats had been steaming. Virus isolation was positive for FHV in 13 of 24 eyes (68%) and for FCV in eight of 24 eyes (34%). Immunohistochemical stains for FHV and FCV were negative in all samplings. Histopathologic examination of biopsy samples showed conjunctival hemorrhages and, most importantly, immunohistochemical infections (in the submucosa of most samples. Viral inclusion bodies were not observed. Brush cytology samples typically included the same inflammatory cells as the biopsy samples. Twenty (12 eyes) cats were treated with antiviral therapy at the first or second recheck and 10 cats (18 eyes) did not improve with antiviral therapy alone and were treated with anti-inflammatory medication. Conclusion: Conjunctival immunohistochemistry was not helpful in diagnosing viral infections. Viral infection could be demonstrated in only 30% of eyes but the majority of cats improved with therapy, or in the case of FCV, on their own. Epithelial ulceration and response to treatment suggested a viral cause. Conjunctival histopathology was not helpful in identifying a non-viral negative virus isolation. Many cats required topical anti-inflammatory therapy for additional improvement or resolution of conjunctivitis.

ABSTRACT NO.: 09

Development of an ex vivo model of retinal diseases

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Purpose: To develop and standardize an organotypic culture model of porcine neuroretina that would allow us to study Mueller cell modifications in response to the addition of peripheral blood lymphocytes (PBLs) or monocytes and lymphocytes as a source of macrophages. Methods: Neuroretinas were mechanically detached from the retinal pigment epithelium and cut into 5 mm explants. Control and PBL-stimulated neuroretinal explants were cultured in Transwell inserts in bicameral culture inserts (Corning Inc., NY, USA), containing Neurobasal A medium. Specimens were examined at 3, 6, and 9 days of culture and processed for epoxy-resin embedding and cryosectioning. Light and confocal laser scanning microscopy were performed, using toluidine blue staining and antibodies against glial fibrillary acidic protein (GFAP), as a reactive gliosis marker, and cellular retinolephilic-binding protein (CRALBP), as a Mueller cell marker. Results: The explants were cultured for 12 days and produced increased cellular disorganization and larger tissue invasion of the subretinal space at 9 days of culture. Immuno-staining of the PBL-treated explants revealed evidence of more reactive gliosis and greater macrophage infiltration. Support: This work was supported by the Société Française d’Études et de Recherches en Ophthamologie Vétérinaire (SFEROV) and by Urgent.

ABSTRACT NO.: 13

Causes of canine uveitis in Lisbon region: 122 clinical cases (2001–2009)

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Purpose: The purpose of this study was to identify the most common causes of canine uveitis in the Lisbon region, Portugal. Methods: Medical records of 14 horses with a diagnosis of indolent corneal ulcers between January 2005 and December 2008 were analyzed. All dogs had complete clinical and ophthalmic examinations and the diagnosis of SARDS was based on electroretinographic (ERG) studies, which demonstrated abolished or subnormal ophthalmoscopic findings. Results: The sudden acquired retinal degeneration syndrome (SARDS) in dogs is characterized by an acute and irreversible loss of vision. A number of cases recently examined showed a higher risk of the Brittany Spaniel breed for SARDS. Whereas the susceptibility of the Brittany Spaniel to SARDS is well documented, the susceptibility of other breeds is less clear. The presence of infectious diseases had only unilateral uveitis. In general, younger dogs were more likely to have infectious or traumatic uveitis whereas older dogs were more prone to neoplastic or phacoxytic uveitis. Conclusions: Because of the high prevalence of systemic diseases, thorough physical examination in dogs, extensive diagnostic testing is recommended before instituting symptomatic anti-inflammatory therapy. Non-specific treatment for uveitis sometimes includes potent anti-inflammatory medications such as corticosteroids. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS.

ABSTRACT NO.: 14

Sudden acquired retinal degeneration in the dog: report of fifteen cases with susceptibility of the Brittany Spaniel

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Purpose: The sudden acquired retinal degeneration syndrome (SARDS) in dogs is characterized by an acute and irreversible loss of vision. A number of cases recently examined showed a higher risk of the Brittany Spaniel breed for SARDS. Whereas the susceptibility of the Brittany Spaniel to SARDS is well documented, the susceptibility of other breeds is less clear. The presence of infectious diseases had only unilateral uveitis. In general, younger dogs were more likely to have infectious or traumatic uveitis whereas older dogs were more prone to neoplastic or phacoxytic uveitis. Conclusions: Because of the high prevalence of systemic diseases, thorough physical examination in dogs, extensive diagnostic testing is recommended before instituting symptomatic anti-inflammatory therapy. Non-specific treatment for uveitis sometimes includes potent anti-inflammatory medications such as corticosteroids. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS.

ABSTRACT NO.: 15

Superficial nonhealing corneal ulcers in 14 horses: occurrence, clinical symptoms and surgical treatment

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Purpose: To describe the occurrence, clinical symptoms, and to evaluate the results of superficial nonhealing corneal ulcers (SNCU) in 14 horses. Methods: Medical records of 128 horses with superficial nonhealing corneal ulcers (SNCU) were included in this study. Results: The sudden acquired retinal degeneration syndrome (SARDS) in dogs is characterized by an acute and irreversible loss of vision. A number of cases recently examined showed a higher risk of the Brittany Spaniel breed for SARDS. Whereas the susceptibility of the Brittany Spaniel to SARDS is well documented, the susceptibility of other breeds is less clear. The presence of infectious diseases had only unilateral uveitis. In general, younger dogs were more likely to have infectious or traumatic uveitis whereas older dogs were more prone to neoplastic or phacoxytic uveitis. Conclusions: Because of the high prevalence of systemic diseases, thorough physical examination in dogs, extensive diagnostic testing is recommended before instituting symptomatic anti-inflammatory therapy. Non-specific treatment for uveitis sometimes includes potent anti-inflammatory medications such as corticosteroids. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS. Sudden blindness in cats. To the authors' knowledge, this is the first report in this animal species. Accordingly, blindness in cats was considered to be a manifestation of SARDS.

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14 horses showed minimal corneal vascularization. Two of the 14 cases showed signs of chronic uveitis. Horses generally did respond well to superficial keratectomy and grid keratotomy. Twelve horses healed after one surgical treatment, and two horses healed after two surgical treatments. One horse was euthanized at 5 days OD, two horses showed signs of perioperative complications after the 14 horses showed signs of superficial corneal vascularization. Two months after surgical treatment the cornea become completely clear in all horses. Conclusion: Superficial keratectomy and grid keratotomy are effective for superficial nonhealing corneal ulcers in horses. This surgical procedure is simple, rapid, with uncomplicated healing of the cornea and strengthens well the adhesion of the epithelium to the corneal stromal collagen fibers.

ABSTRACT NO.: 16
Investigation of recoverin as possible autoantigen in patients with sudden acquired retinal degeneration syndrome (SARDS)
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Purpose: The etiology of canine sudden acquired retinal degeneration syndrome (SARDS) remains still unclear. We previously reported that antibodies against neuron specific enolase (NSE) were detected in sera of canine SARDS, which might play a role in the pathogenesis of SARDS. In the past it has also been suggested that SARDS patients might share a similar etiology. The aim of this study was to investigate antibodies against recoverin in the sera of SARDS patients with sudden onset blindness, a normal fundus and an extinguished ERG. Patients with CAR develop antibodies against recoverin due to a small lung carcinoma, which expresses recoverin. As no studies with purified recoverin have been performed so far, we decided to investigate the possible involvement of antibodies against recoverin in the etiology of SARDS.
Methods: Veinocutaneous samples were used to screen serum samples for anti-recoverin antibodies in 25 serum samples of typical SARDS patients and 15 normal controls. SARDS was diagnosed by sudden onset blindness, a normal fundus and an extinguished electroretinogram (ERG). All SARDS serum samples were analyzed for anti-recoverin antibodies. Analysed sera were incubated with a cell culture with Hep-2 cells, a Chlamydiaceae Real Time PCR (23S rRNA as target sequence) taken from each cat. Two swabs for cell culture and one swab for PCR. Cats that suffered from symptoms of autochthonous Chlamydophila pneumoniae (homozygosity mapping). All these positive cats had signs for

ABSTRACT NO.: 20
Magnetic resonance imaging findings in a case of blindness following an anesthetic accident in a dog
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Purpose: This case report describes the clinical and magnetic resonance imaging (MRI) findings of a case of blindness caused by suspected brain hypoxia following general anesthesia in a dog. To the author's knowledge, blindness as the sole neurological deficit following an anesthetic accident has not been reported in the dog. Methods: An 8-month-old male neutered Siberian Husky presented for assessment of bilateral visual deficits. Four days earlier, the dog underwent a general anesthesia for castration at the referring veterinary practice. Anesthetic monitoring was limited and during the anesthesia an approximately 3-minute period occurred during which oxygen delivery to the dog was compromised. No obvious abnormalities were reportedly noted during recovery and the dog was discharged the same day. The owners noticed a significant deterioration in vision over the following 24–72 h. Results: Ophthalmic examination revealed no menace response and reduced and incomplete pupil light reflex bilaterally. An slit-lamp and indirect ophthalmic examination showed no structural abnormalities. Schirmer's tear test and tonometry values were within reference values. The electroretinogram showed normal implicit times and normal amplitudes. A MRI of the brain was declined by the owner at this point. Therefore an oral prednisolone therapy (1 mg/kg once daily for 10 days) was suggested as a symptomatic treatment. After an immediate and complete vision followed. Deterioration of vision accompanied by (other) neurologic symptoms occurred after a medication free period of 2 months. MRI of the brain was performed after a complete general, neurologic and ophthalmologic examination. A fluid-filled cyst between the cerebrum and the occipital lobe and an altered structure ventrally to the cerebellum in the brain stem was detected. The radiologic diagnosis was: intracranial arachnoid cyst in the quadrigeminal cistern. The visual deficits and the neurologic symptoms improved again under systemic prednisolone medication. Due to this fact a surgical intervention was refused by the owner. Conclusion: An intracranial arachnoid cyst in the quadrigeminal region is not a rare finding and should be considered as a differential diagnosis, especially in male toy breed dogs.

ABSTRACT NO.: 22
Congenital keratoconjunctivitis sicca and ichthyosiform dermatosis (ckcsid) in the Cavalier King Charles Spaniel (CKCS) dog: a candidate gene study
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Purpose: To identify causative mutations(s) for CKCSID in CKCS dogs using a candidate gene approach. DNA from 21 cases/patients were collected. Canine candidate genes (CCGs) for similar inherited human diseases were chosen. Twenty-eight candidate genes were identified by searching the Pubmed database (http://www.ncbi.nlm.nih.gov/sites/entrez/query?db=pubmed) for the keywords that describe the orthologous of human CKCSID. The CCGs were then included in a cell culture with Hep-2 cells, a Chlamydiaceae Real Time PCR (23S rRNA as target sequence) was performed on a panel of 21 DNA samples from CKCS dogs (13 affected, 8 carriers). Genotyping data was analysed to identify markers homozygous in affected dogs and heterozygous in carriers (homozygosity mapping). Results: None of the microsatellites associated with 25 of the CCGs displayed an association with CKCSID in the 21 DNA samples tested. Three CCGs associated microsatellites were monomorphic across all samples tested. Conclusion: Twenty five CCGs could not be excluded from involvement in the inheritance of CKCSID. Support: Kennel Club Charitable Trust Grant.

ABSTRACT NO.: 23
Detection of Chlamydia in the conjunctiva of cats with and without conjunctivitis
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Purpose: To determine the prevalence of Chlamydia in cats with conjunctivitis versus cats without conjunctivitis and in cats from the animal shelter versus privately owned cats. To evaluate the role of new chlamydial agents in cats and to compare sensitivity, specificity and practicality of cell culture and PCR in the detection of C. felis. Methods: Twenty five cats without conjunctivitis and 49 cats with conjunctivitis (21 from the animal shelter, 24 privately owned) were tested for Chlamydia. After an ophthalmologic examination three conjunctival swabs were taken from each eye (Frontal, Temporal, Lateral). Two swabs for cell culture and one swab for PCR. Cats that were previously treated with new chlamydial agents were tested with a genus-specific Chlamydia-IG-ELISA and a species specific Chlamydia pneumoniae IgG-ELISA. Results: In two cats one eye was positive for Chlamydia felis. One eye of four cats and OU of a fifth cat were positive for Chlamydia felis. Conclusion: Cats positive for Chlamydia felis were positive for Chlamydia felis.
ABSTRACT NO.: 24
Comparison of anaesthetic complications between diabetic and nondiabetic dogs undergoing phacoemulsification cataract surgery: a retrospective study
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Purpose: This study compared the incidence of anaesthetic complications in diabetic and nondiabetic dogs undergoing general anaesthesia and phacoemulsification cataract surgery.

Methods: The medical and anaesthetic records of all dogs undergoing phacoemulsification cataract surgery at a tertiary referral hospital between October 2004 and 2008 were reviewed. Inhalation anaesthetic records were evaluated by an ECVAA Diplomate. Dogs for which records were incomplete were excluded. Fifty-six diabetic and sixty-one nondiabetic dogs were included in the study. The anaesthetic records included all drugs administered in the perioperative period, were recorded. The anaesthetic complications investigated included hypotension (mean arterial pressure (mmHg) < 55–59), bradycardia (< 60 bpm) associated with hypotension and hypothermia (rectal temperature < 36.5°C). Where hypotension was present, the method of and response to treatment was recorded. The incidence of severe hyperglycaemia (blood glucose > 13.7 mmol/l) in the diabetic group was also assessed. Statistical analysis was performed using two-tailed methodology, chi-squared tests, t-test and Wilcoxon rank-sum test.

Results: Of P < 0.05 were considered significant. Results: Age, breed and sex were comparable for both groups. Diabetic dogs had a significantly higher rate of anaesthetic complications (86% of the group) compared to nondiabetic dogs (65% of the group). Hypotension was significantly more likely to occur in diabetic dogs (71% of group; 20% in severe category) than nondiabetic dogs (61% of group; 15% in severe category). Where hypotension occurred, it required more aggressive treatment in diabetic than nondiabetic dogs (47% of dogs and 36% non-diabetics required treatment). Where hypotension was severe, diabetic dogs had at least one episode of severe hyperglycaemia whilst under general anaesthesia. Conclusion: Diabetic dogs undergoing phacoemulsification are more likely to suffer anaesthetic complications, in particular hypotension, than nondiabetic dogs. The increased incidence and severity of hypotension in diabetic dogs may be explained by hyperglycaemia in these dogs secondary to hyperglycaemia and resultant osmotic diuresis.

ABSTRACT NO.: 27
Dacryocystitis in rabbits: 28 cases (2003–2007)
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Purpose: To document the clinical presentation, diagnosis, treatment and clinical outcome of rabbits with dacryocystitis.

Methods: This retrospective study included 28 rabbits (75% females) with dacryocystitis. Available records of clinical and ophthalmological examinations, bacteriological and imaging treatment were reviewed. A telephone survey of the owners was conducted to evaluate recovery and recurrences.

Results: The mean age of the 28 Rabbits presented with ocular discharge from the nasolacrimal duct was 4.4 years. In 23 rabbits (89%), dacryocystitis was unilateral. No specific cause could be evaluated in 10 animals (36%). Dental malocclusion was observed in 15 rabbits (54%), rhinitis in 3 animals (11%) with one animal showing both symptoms. One rabbit (4%) was presented with panophthalmitis. Most (36%) of the rabbits were diabetic (36% of the group) compared to nondiabetic dogs (61% of the group). Hypotension was significantly more likely to occur in diabetic dogs (71% of group; 20% in severe category) than nondiabetic dogs (61% of group; 15% in severe category). Where hypotension occurred, it required more aggressive treatment in diabetic than nondiabetic dogs (47% of dogs and 36% non-diabetics required treatment). Where hypotension was severe, diabetic dogs had at least one episode of severe hyperglycaemia whilst under general anaesthesia. Conclusion: Diabetic dogs undergoing phacoemulsification are more likely to suffer anaesthetic complications, in particular hypotension, than nondiabetic dogs. The increased incidence and severity of hypotension in diabetic dogs may be explained by hyperglycaemia in these dogs secondary to hyperglycaemia and resultant osmotic diuresis.

ABSTRACT NO.: 28
Cellular-resolution in vivo imaging of the cat retina using adaptive optics
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Purpose: To image the cat retina with cellular-resolution using an adaptive optics (AO) flow illumination fundus camera (FIC) designed for the human eye. Methods: We recorded cellular resolution images in the cat retina using two-seated (rod/monochromatic) ACG rats. Ocular waveform aberrations (OWAs) were corrected using an AO system operating in closed-loop at 10 Hz, based on a 52-actuator electromagnetic deformable mirror and a 1024 lenslet Shack-Hartmann sensor (both Imagine Eyes, France). A square 3 x 1° area of the eye fundus was illuminated by a pulsed LED emitting at 850 nm and imaged on a low-noise CCD camera (Roper Scientific, USA). The animals’ pupils were dilated (1% tropicamide) and the effective pupil size was set to 7.5 mm. The on-scan retinal movements were corrected in real-time. The entire procedure was repeated three times. Every acquisition consisted in 20 consecutive images, out of which 10 were numerically averaged to produce an enhanced final image. Results: The total amount of OWAs was strongly reduced by AO correction. Wavefront errors were corrected from 0.2 to 0.3 μm RMS and resulted in a decrease in M-scan of 8 times compared to images without AO correction. We succeeded in visualizing retinal cells as well as small blood vessels. Cones and nerve fiber bundles were clearly discernible and their counting was possible. Blood vessels walls were more sharply resolved than in all the other images. Conclusions: Retinal imaging with cellular resolution was feasible in cats under sedation using an AO FIC designed for human eyes without any optical modification. The system’s resolution might be further enhanced by optimizing its optical magnification for the cat’s pupil size. The AO-FIC technology could find new applications in clinical, pharmacological and toxicological investigations.

ABSTRACT NO.: 29
Acute bilateral postretinal blindness: ophthalmologic, neurologic and magnetic resonance imaging findings in dogs and cats (8 cases)
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Purpose: To describe the ophthalmologic, neurologic and magnetic resonance imaging findings of eight animals with acute postretinal blindness as sole neurologic deficit.

Methods: Retinal and CNS records of dogs and cats suffering with blindness as main clinical complaint were searched from 2004 to 2008. Among these, a selection was made based on the following criteria: clinical diagnosis of postretinal blindness, no evidence of other neurologic signs on neurological examination and without treatment at presentation, and a non-diabetic M type as part of the diagnosis. In addition to complete physical, ophthalmologic, and neurologic examinations, the following diagnostic tests were performed in all animals: CBC, complete serum biochemistry, thoracic radiographs, abdominal ultrasound, electroretinogram and cranial MRI. Cerebrospinal fluid (CSF) analysis was performed in six animals, and postmortem histopathological examination was performed in five animals. Presumptive and histopathological diagnoses were correlated. Results: Eight animals fulfilled the inclusion criteria (5 dogs and 3 cats). Intracranial lesions affecting the visual pathways were observed on MR images in seven cases. Exact localization, intensity and number of MR features of the lesions were described. Neuropathologic localization of the lesions included: olfactory region with involvement of the optic chiasm (n = 4), pituitary fossa with invasion of the optic chiasm (n = 3), pituitary fossa with involvement of the optic chiasm (n = 2), right lateral ventricle (n = 1), left lateral ventricle (n = 1), cerebellum (n = 1), and brain stem (n = 1). The most common lesions were: meningioma (5 cases), pituitary adenoma (3 cases), and craniopharyngioma (2 cases). Conclusion: Neoplasms were the most common cause of postretinal blindness. In particular, the most common lesions were meningioma, pituitary adenoma, and craniopharyngioma.
chosen as controls. All horses were examined ophthalmo-scopically and with a slit-lamp bio-

microscope before and after dilation of the pupils with tropicamide. Results: Temporal ciliary
cysts and temporal curvilinear retinal streaks heralding previous focal retinal detachments were seen in both eyes of the homoygote and two of the heterozygotes. The homoygote stollal also showed bilateral miosis and iridal stromal hypoplasia, as well as bilateral, main-
coronal cataracts. No ocular abnormalities were detected in three of the heterozygotes and the five homozygous horses. Results: Ocular examination was carried out by the silver dapple
mutation. Conclusion: Three Icelandic horses, homoygous or heterozygous for the silver dapple mutation, showed similar ocular abnormalities as previously described by Ramsey et al. in Rocky Mountain horses with the homozygous

ABSTRACT NO.: 34

Retrospective study of external-beam Co-60 radiation therapies with orbital fields in 30 dogs

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Purpose: The aim of the study was to retrospectively evaluate cancer bearing dogs treated with external-beam Co-60 radiation in which one or both orbits were included in the radiation field. Methods: Signalment, tumor type, radiation protocols, and ocular radiation side effects were evaluated in 30 cases presented to the Ontario Veterinary College from 1999 to 2009. Results: The most common breeds were golden retriever, mixed breed and Labrador retriever. The mean age was 8 years (range 4–14 years). There were 17 female spayed, 9 male castrated, 3 male, and 1 female dog(s). The most common tumors were salivary adenocarcinoma, choroid-
oma, and carcinoma. The radiation protocols ranged from a total of 60 Gy in 24 fractions for curative intent (17 cases) to a total 24 Gy in 3 fractions for palliative treatment (13 cases). The average field size was 12 × 9 cm and included one or OU. Ocular data was available for 28 cases. The main side effects reported were conjunctivitis (21), mucoid/mucopurulent discharge (15), periorcular alopecia and blepharitis (11). Keratoconjunctivitis sicca (KCS) (12), keratitis (7), and corneal vascularization were inconsistently diagnosed. Curative protocols had more reports of inci-
cidence of KCS (8) and palliative protocols had more reports of ocular discharge (10). Other reported ocular conditions were of similar incidence with both protocols. All cases responded to p.o. carprofen (Rimadyl, Pfizer). Results: The focus was the SFEROV’s protocol

ABSTRACT NO.: 35

Treatment of corneal pigmentary keratitis by cryosurgery: a retrospective study of 20 cases

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Purpose: In pigmented keratitis, the veterinarian’s goal is to slow the rate of corneal pigment by correcting the irritating factor or controlling it medically. In certain cases where pigmentation is extended, it can lead to visual impairment and blindness. Cryosurgery is then an interesting alternative treatment for corneal pigment. The aim of this study is to evaluate the efficacy of corneal cryosurgery in the horse. Methods: Twelve dogs presenting with uni- or bilateral corneal melanic pigmentations were included. The pre-operative ophthalmological examination on each dog allowed us to determine the cause of the corneal disease, the results of the tear test, and the severity of pigmentation and its repercussion on sight. A cryotherapy kit (Askina Skin Freeze) was used for the corneal applications. The cryogenic agent was applied to pigmented zones of the cornea. Duration as well as number of applications were recorded. A postoperative treatment was prescribed and included depending on the case a topical antibiotic with or with-
out corticosteroids and artificial tears. Results: An eye examination was conducted in 5 days, 2, weeks, and 1 month after surgery. Pigmentation, edema and corneal lesions were recorded, as well as the patient’s visual behavior. Conclusion: The good clinical results of this study show that cryosurgery is an attractive therapeutic option in corneal pigmentation. Less invasive and easier to perform than superficial keratectomy, it is quick and cost-effective and can be used several times without damaging the cornea. An etiological treatment remains nonethe-
less absolutely necessary, or pigmentation will rapidly reappear.

ABSTRACT NO.: 36

Extraction of an adenoma of the ciliary body

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Purpose: The surgical removal of tumors of the ciliary body with the aim of maintaining the eye and vision bare a lot of risks. The aim of this presentation is to show how to avoid some of those risk factors. Methods: A 9-year-old dog showed a nonpigmented tumor of the ciliary body in the OD. The removal of the tumor was prepared with a prophylactic transpalpebral 360° laser photocoagulation (VisuLite II, 810 nm, Zeiss, Germany). The tumor excision was carried out 4 weeks later. The approach was done with an H-shaped scleralcutural cut. For this cut as well as the excision of the part of the ciliary body in the OD, the Diacapsutom (Erbe, Germany) was used. Postoperative therapy included topical prednosolone acetate (Flunisolide, Alcon). Results: The tumor excision and recovery were uneventful. On histological analysis the tumor was an adenoma (2 months post-op). Follow-up examinations every 6 months showed no regrowth of the tumor. The eye appeared quiet and the dog was visual. Conclusion: In our opinion the pre-surgical retinopexy is reasonable. The H-shaped approach appears to be appropriate for the excision of ciliary tumours if there is no sclera involved. The Diacapsutom seems to be an appropriate tool for the safe and precise preparation with a very low risk of bleeding.

ABSTRACT NO.: 37

Multiple congenital ocular abnormalities in Icelandic horses

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Purpose: To screen and describe ocular abnormalities in Icelandic horses carrying the silver
dapple mutation. Methods: Eleven Icelandic horses were selected for ophthalmic examination. Six of these were known to be either homozygous (1 stallion) or heterozygous (4 mares, 1 stallions) for the dapple mutation. The pre-operative ophthalmological examination

ABSTRACT NO.: 38

Tear film osmolarity in healthy dogs

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Purpose: The aim of this project was to evaluate the feasibility of the TearLab™ Osmolarity (OutoSense, San Diego, USA) and to gain information on tear film osmolarity in healthy dogs. Methods: Tear film osmolarity was determined in 76 healthy dogs using the TearLab™ Osmolarity with a range of measurement from 273–400 mOsm/L. Additionally a general and ophthalmic examination including slit-lamp biomicroscopy (SL-11, Kowa, Japan) and Schirmer’s tear test (SST, Esex, Germany) was performed. The study includes female and male dogs (neutered and neutered) of different breeds and age (0.3–4.4 years), living in private keeping, animal shelter or as laboratory animals. Twelve animals were tested bilaterally. One subgroup was examined repeatedly (different days, different time of day) Results: No animals displayed measurable changes below six times. Six of these animals showed changes of 0.3 mOsm/L in the left eye and 0.5 mOsm/L in the right eye. Conclusion: The TearLab™ Osmolarity test is well-tolerated by dogs and may be used in dogs. According to our data the tear film osmolarity in healthy dogs seems to be less uniform as in humans.

ABSTRACT NO.: 41

Electroretinogram (ERG) recording on mini-pigs with a modified Société Française d’Etudes et de Recerches en Ophthalmologie Vétérinaire SFEROV’s protocol

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Purpose: To test a simple electroretinographic protocol, inspired by the protocol of the Société Française d’Etudes et de Recerches en Ophthalmologie Vétérinaire (SFEROV) on mini-pigs to control its usefulness in laboratory animals. Methods: ERGs were recorded on 162 healthy mini-pigs, age 4–6 months (81 males and 81 females). After a 1 h 30 light adaptation, 12.909 vs.

ABSTRACT NO.: 45

Topical ocular corticosteroid administration in dogs with experimentally-induced latent canine herpesvirus-1 infection

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Purpose: To determine if topical ocular corticosteroid administration reactivates latent canine herpesvirus (CHV-1) in adult dogs. Methods: Eight beagle dogs were randomly assigned to a placebo (0.1% ophthalmic suspension, one drop, OU, q6h) or placebo (artificial tear solution, one drop, OU, q6h) for 28 days. After a 14-day washout period, the treatment groups were reversed. Ophthalmological examinations, ocular pH, chloride, and tear osmolarity measurements were performed. Results: Viral reactivation was not detected

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more frequently in dogs administered topical ocular prednisolone than dogs administered placebo as determined by clinical ocular disease recrudescence, ocular viral shedding, and serologic response. Conclusions: The present study suggests administration of topical ocular prednisolone significantly increases the incidence of clinical ocular disease recrudescence, ocular viral shedding, and serologic response.

ABSTRACT NO.: 47
Contralateral optic neuropathy and retinopathy associated with visual and pupillomotor dysfunction following enucleation in six cats.

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Purpose: To describe the clinical and histopathologic findings associated with visual and pupillomotor dysfunction following enucleation in six cats.

Methods: Retrospective study. Information recorded included age, sex, breed, reason for enucleation, surgical technique used for enucleation, ophthalmic findings, and long-term ophthalmic findings. Further investigations included electron microscopy (EM) of the retina in two cases and cardiac echocardiography (CE) in one case.

Results: Six cases (4.5, 3.5, 3.5, 3.5, 3.5, 3.5) were examined over a period of 1.5 years. Six cats were presented with unilateral blindness (5/6), and a single case presented with bilateral blindness (1/6). The majority of cases (5/6) were presented with strabismus (4/6), nystagmus (4/6), and facial asymmetry (5/6). Visual field testing was performed in four cases and was abnormal in all cases. Fundus photography obtained using a Kowa RC-2 or Genesis camera (Kowa, Duesseldorf, Germany) (4/6).

Conclusion: The results of this study suggest that visual and pupillomotor dysfunction following enucleation in cats is a frequent occurrence. Further studies are required to determine the etiology of these findings.

ABSTRACT NO.: 48
Ocular findings in 14 cats with anemia and/or thrombocytopenia: preliminary findings of a prospective study.

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Purpose: Anemia and thrombocytopenia are common hematological abnormalities and are listed as potential causes of retinal hemorrhage in cats. This prospective study was conducted to document the prevalence and characteristic of ocular abnormalities in anemic and/or thrombocytopenic cats.

Methods: Selected cats were presented to the Hebrew university Teaching Hospital. The inclusion criteria were presence of anemia (packed cell volume <24%) and/or thrombocytopenia (platelets <200 × 10^9/L/mm^3). Fourteen cats met the inclusion criteria and were classified into two groups. Group I (11 cats) had both anemia (anemia, 10/11) and thrombocytopenia (thrombocytopenia, 9/11) and Group II (3 cats with normal platelet count).

Results: In Group I, 7/11 cats had retinal hemorrhages, 3/11 had retinal edema, and 3/11 had a combination of retinal hemorrhages and edema. In Group II, 2/3 cats had retinal hemorrhages, 1/3 had retinal edema, and 1/3 had a combination of retinal hemorrhages and edema.

Conclusion: The results of this study suggest that cats with anemia and/or thrombocytopenia are at increased risk for retinal hemorrhages and edema. Further studies are required to determine the underlying mechanism(s) and the clinical significance of these findings.

ABSTRACT NO.: 49
Serum amyloid A (SAA) in equine serum and vitreous.

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Purpose: Serum amyloid A (SAA) is among the fastest reacting acute phase proteins in horses and is used as a sensitive marker for inflammatory disease. However, the vitreous occurrence of SAA in horses is unknown. Therefore, the purpose of this study was to determine whether SAA can be detected in serum or vitreous in horses suffering from inflammatory and non-inflammatory diseases.

Methods: Serum and vitreous were obtained from 24 horses assigned to one of 5 mutual exclusive groups: horses without inflammatory diseases (n = 10), horses with inflammatory diseases (n = 5), horses with corneal ulceration (n = 3). One foal with hypopyon was included. Concentrations of SAA in the serum and vitreous were determined using a previously validated assay.

Results: SAA concentrations ranged from 0.7 ± 0.6 mg/mL to 2.8 ± 1.4 mg/mL in serum and from 0.7 ± 0.6 mg/mL to 2.0 ± 1.2 mg/mL in vitreous. The concentration of SAA in serum was significantly higher than in vitreous (P < 0.05).

Conclusion: The results of this study suggest that SAA is present in serum and vitreous in horses suffering from inflammatory and non-inflammatory diseases. Further studies are required to determine the clinical significance of these findings.

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ABSTRACT NO.: 58
Clinical aspects of Equine Herpesvirus 2 and 5- induced keratitis in 134 horses
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Purpose: The significance of Equine Herpesvirus (EHV) 2/5 causing superficial and/or profound keratitis in horses has been discussed very controversially in the past. Since the coincidence of different forms of acute and chronic keratitis and a positive proof (PCR) for EHV 2/5 is obvious, from January 2007 until December 2008, 134 horses with a typical history and characteristic clinical signs of unilateral or bilateral keratitis were carefully examined and treated for a possible EHV-mediated keratitis. Methods: A three step therapy was applied for acute superficial kerato-conjunctivitis, that is, medical treatment (systemic and/or local) followed by superficial debridement and, if necessary, use of a soft contact lens. Superficial keratectomy was performed in nonhealing and/or chronic cases (89 eyes), when medical treatment failed or pathological changes of the cornea (ulceration, progressive deep keratitis) occurred. In addition to taking kerato-conjunctival swabs and scrapings prior to treatment and/or surgery in all horses, a specific PCR was performed on the corneal material (superficial and interstitial tissue) isolated from keratectomy. Results: PCR for EHV 2/5 was positive in 71 eyes, of which 32 eyes were tested negative for EHV prior to surgery. Recurrence of clinical signs of keratitis was observed in 67% of all horses with medically treatment alone, while renewed keratitis in horses after keratectomy occurred in four eyes only. Conclusion: Medical treatment of kerato-conjunctivitis presumed to be based on EHV 2/5 infection is not always successful, whereas surgery in severe cases seems to be an effective and definite solution.

ABSTRACT NO.: 59
In vitro effects of antifungal drugs and delivery vehicles on morphology and proliferation of equine corneal keratocytes
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Purpose: To evaluate effects of topical antifungal drugs and delivery vehicles on the morphologic and proliferation properties of cultured equine corneal keratocytes. Methods: Primary cultured equine keratocytes were exposed to three different concentrations of commonly used topical antifungal drugs, natamycin (5, 0.5, and 0.05 mg/mL), itraconazole (1, 0.1, and 0.01 mg/mL) and miconazole (1, 0.1, and 0.01 mg/mL). Effects of delivery vehicles for these drugs, dimethyl sulfoxide (0.6, 0.5, and 0.05 mg/mL), benzalkonium chloride (0.02, 0.002, and 0.0002 mg/mL) and carbomyethylcellulose (0.6, 0.06, and 0.006 mg/mL) were also evaluated. Morphologic changes and cellular proliferation were assessed 24, 48, and 72 h after application. Results: At the highest concentrations tested, all antifungal drugs caused marked cellular morphologic changes and inhibited proliferation. At lower concentrations, natamycin and miconazole induced cell rounding, shrinking and detachment with natamycin causing the most severe morphologic changes. Natamycin and miconazole also inhibited cellular proliferation at all concentrations. Itraconazole, at the lower concentrations, caused minimal morphologic changes and had no effect on proliferation. Benzalkonium chloride and carbomyethylcellulose, at the highest concentrations, caused marked morphologic changes and decreased cellular proliferation, while the lower concentrations showed no significant effects. Dimethyl sulfoxide had minimal cellular effects at the highest concentration and no effect at the two lower concentrations. Conclusion: Natamycin and miconazole induced marked cellular changes at all concentrations used. In contrast, itraconazole caused only mild morphologic changes and did not affect proliferation, at the lower concentrations. Dimethyl sulfoxide, although not commonly used as a carrier for topical ophthalmic antifungal drugs, produced minimal cellular changes and warrants further consideration as a potential ophthalmic vehicle. Support: The University of Georgia Veterinary Ophthalmology Research Fund.

ABSTRACT NO.: 60
Evaluation of rebound and applanation tonometry in normal and chronically glaucomatous cats
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Purpose: To determine the accuracy and reproducibility of IOP measurements obtained with the TonoVet® rebound tonometer (Teliop Oy, Helsinki, Finland) and Tonoopen-XL® applanation tonometer (Reichert, Depew, NY) in normal and glaucomatous cats. Methods: The anterior chambers of OU of three adult cats (2 glaucomatous and 1 normal) were cannulated with branched, 21-gauge needles under ketamine-xylazine anesthesia. One branch of each needle was attached to a vertically adjustable reservoir of degassed Bárány’s solution, while the other branch was attached to a pressure transducer, amplifier, voltmeter, and pen recorder, to allow measurement of manometric IOP. IOP was increased by 5 mmHg increments from 5 to 70 mmHg, and then decreased by 10 mmHg decrements to 10 mmHg, by raising and lowering the reservoir. At each increment and decrement, 3 TonoVet and 3 Tono-Pen XL readings were obtained for each eye by two independent observers. Results: In both normal and glaucomatous cats, TonoVet readings were accurate, with acceptable precision (mean slope = 1.032 ± 0.036, r² = 0.931 ± 0.045, y intercept = 2.23 ± 2.19) and minimal inter-observer variability. Measurements obtained with the Tono-Pen XL were reproducible but inaccurate, as this tonometer consistently underestimated IOP at all but the lowest IOPs (mean slope = 0.622 ± 0.044, r² = 0.951 ± 0.036, y intercept = 1.41 ± 0.65). Conclusion: The TonoVet tonometer allows further consideration as a potential ophthalmic vehicle. Support: NIH Grants K08 EY018609 and P30 EY016653.