DPI. To determine if the inability to infect nude mice was stock dependent, Hsd:Athymic Nude-*Foxn1*^{nu} mice (n = 6) were similarly infected with L3 larvae. Only 2 of 6 mice shed eggs at 8 DPI shed < 25 EPG. Eggs were not detected at days 16 or 28 DPI. While NSG mice became chronically infected, nude mice did not. The results of this study, possible explanations, and their implications on research are reported.

P347 Improved Detection and Transmission of *Proteus mirabilis* in Immunodeficient Mice

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Opportunistic pathogen exclusion is important for protecting animal health and ensuring desired research outcomes in immunodeficient mice. *Proteus mirabilis* has been associated with gastrointestinal tract lesions, septicemia, pyelonephritis, splenomegaly, and hepatitis and can influence select mouse models. To inform colony health surveillance practices following difficulty excluding *P. mirabilis*, we aimed to determine the likelihood of detecting *P. mirabilis* positive immunocompromised (SRG; n=32), immunovague (Fbn1$^{+/-}$; n=16), and immunocompetent (CD-1; n=16) colony mice by culture and PCR; to evaluate transmission by 2 sentinel approaches (direct contact, n=16 cages; indirect dirty bedding transfer, n=16 cages); and to further characterize associated pathology (n=24 mice). We hypothesized immunocompromised mice would be better detectors and transmitters of *P. mirabilis*. Multiple logistic regression models were used for analysis and included PCR copy number, repeat testing, age (various), sex (both), and diet (Trimethoprim and Sulfamethoxazole) as covariates. After 10 wk of repeat testing, *P. mirabilis* colonized immunocompromised mice were 95 times more likely than immunocompetent mice to test positive by culture (P=0.006) and 30 times more likely by PCR (P=0.022). Sentinel mice were 15 times more likely to test positive by PCR for *P. mirabilis* if exposed by direct contact compared to dirty bedding (P=0.006) and 18 times more likely to test positive if exposed to positive immunocompromised colony mice instead of immunocompetent (P=0.001). After 10 wk of exposure, 3.8% of bedding sentinel PCR tests were positive, as opposed to 30.7% of contact sentinels (P<0.0001). Only immunocompromised mice on antibiotic diet developed lesions of the urogenital tract and abdominal cavity consistent with known pathology of *P. mirabilis* (37.5%). Our findings suggest that PCR testing of dirty bedding sentinels alone is not sufficient for detecting *P. mirabilis* in mouse colonies and direct contact sentinels, testing colony mice, especially immunocompromised, with adjunct culture indicated for successful bioexclusion.

P348 Feasibility of Using a Non-contact Infrared Thermometer to Monitor Disease Progression and Make Endpoint Decisions in SARS-CoV-2-infected hACE2 Hamsters

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Several animal models for SARS-CoV-2 have been established to investigate therapeutics, test vaccines, and understand the pathogenesis of COVID-19. Our laboratory uses hamsters to evaluate therapeutic efficacy and elucidate the pathogenesis of COVID-19. Because fever is a common clinical sign in human patients with COVID-19, measuring temperature for evidence of fever in the hamster model is desired. By contrast, SARSCoV2infected hACE2 hamsters demonstrate a precipitous drop in the body temperature, which has been effectively used as part of the endpoint criteria for experiments using this model. Typically, transponders are implanted in hamsters to avail temperature monitoring; however, when studies involve computed tomography or magnetic resonance imaging, the transponders produce local artifacts that significantly compromise image evaluation. Developing a reliable alternative method to monitor the temperature of hamsters has received great interest. Since these studies are performed in a biosafety level 4 laboratory and body temperature is obtained at least twice a day, a safe, minimally invasive technique was needed. We explored the use of a non-contact infrared thermometer, which we have used successfully in mice. To determine the feasibility of using infrared temperature, we compared temperatures obtained by infrared thermometer and programmable temperature transponders implanted in 1 female and 4 male adult hamsters. Temperatures were recorded on 10 daytime occasions over a 30-d period. Infrared temperatures were obtained immediately after opening the cage lids. Each hamster was quickly removed from the cage, and a previously shaved ventral area was scanned with an infrared thermometer. Not surprisingly, implantable transponder temperatures were usually higher than skin surface temperatures; however, the alignment between these 2 methods was evident, as demonstrated by correlation coefficients ranging from 0.67 to 0.94, obtained with a correlation function calculation within spreadsheet software. These results demonstrated the feasibility of using a non-contact infrared thermometer to monitor temperature in SARS-CoV-2-infected hamsters and make endpoint decisions without compromising imaging performed during studies.

P349 Immunomodulators as Therapy for Canine Inflammatory Triple-negative Mammary Cancer

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Immunotherapy constitutes a novel, successful, and very active research area in breast cancer. However, little is known about its efficacy in inflammatory breast cancer and even less in the canine species. The aim of this study was to determine the efficacy of an immunomodulator in mice xenotransplanted with the canine inflammatory mammary cancer cell line in terms of tumor growth and levels of estrogens, androgens, and glucorticoids. 24 SCID mice: 12 male and 12 females Fox Chase SCID® Beige CB17.Cg-PrkdcscidLystbg-J / Crl mice, 6-8-wk-old were used. A suspension of 106 IPC-366 cells was implanted orthotopically into the mammary fat pad. When tumors developed, mice were administered orally with a solution of 1 mg/kg/d of Immunocin solution for 4 wk; both experiments were done simultaneously. Mice were inspected twice/wk for the development of tumors. If tumors were detected, they were monitored weekly by palpation and measured by calipers. When tumors reached 1500 mm3 of volume, mice were euthanized, and tumors and organs were used. A portion of tumor was used for hormonal analysis. Steroid hormones determination in serum and tumor homogenates (testosterone (T), 17β-estradiol (E2), cortisol (C), and corticosterone (CT) were assayed by EIA previously validated. In our results, a decrease of 56% in females and 36% in males is observed in tumor progression. The intratumoral E2 levels of mice treated with the immunomodulator are higher in males than in females; however, the levels of testosterone in treated females are significantly higher than in the case of males. Serum and intratumoral cortisol levels are higher in both treated males and females. No differences were found between control and treated mice in serum and intratumoral CT concentrations. In conclusion, the administration of the immunomadulator (Immunocin) produces a significant reduction in tumor progression mediated by the action of steroids. Giving evidence that immunomodulatory drugs could be an effective treatment for canine triple-negative mammary cancer.

P350 Efficacy and Duration of Various Buprenorphine Preparations in a Mouse Hind Paw Incision Model of Pain

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The ideal surgical analgesic regimen has adequate efficacy, sufficient duration, and minimal side effects. Buprenorphine, a synthetic opioid (partial μ agonist and k antagonist), is a common analgesic used to manage postoperative pain in mice, but its duration of action is short, ranging from 4-12 h, minimally requiring administration twice daily. We chose to evaluate 2 buprenorphine products reported to have an extended duration of action: an FDA-approved highly concentrated buprenorphine (up to 24 h in cats) and an FDA-indexed extended-release buprenorphine (up to 72 h in mice), utilizing a validated mouse hind paw incision model. We aimed to determine a dose for these formulations resulting in analgesia for at least 72 h with minimal adverse effects, evaluating doses higher than have been assessed previously. Male C57BL/6J mice (6-8-wk-old; n=6 per group) were administered highly concentrated buprenorphine (10, 30, 60, or 100 mg/kg), extended-release buprenorphine (3.25, 9.75, or16.25 mg/kg), or saline, 1-2 min before hind paw incision. Mechanical allodynia and thermal hypersensitivity of the incised and non-incised paw (using von Frey and Hargreaves tests, respectively) and clinical parameters were assessed 4 and 1 d before, then 4, 24, 36, 48, 60, 72, and 96 h after surgery. Open-field tests quantified activity levels 4 d and 1 d before surgery, then 30 min, 1, 2, 4, 12, 24, and 48 h after treatment. Buprenorphine plasma concentrations were also measured by liquid chromatography-mass spectrometry at 1, 4, 24, 36, 48, 60, 72, and 96 h after treatment. Plasma concentrations were maintained above the minimum therapeutic levels of buprenorphine for up to 48 h for highly concentrated buprenorphine at 30 mg/kg and up to and 36 h for extended-release buprenorphine at 3.25 mg/kg; therefore, these were determined to be the lowest doses to attenuate pain in the incised paw for 72 h with no adverse effects or significant changes in weight or activity.

P351 Evaluation of Compassion Fatigue in Laboratory Animal Personnel During the COVID-19 Pandemic

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Compassion fatigue (CF) is commonly observed in care-associated professions, including both human and animal care. The COVID-19 pandemic challenged laboratory animal research institutions to implement new guidelines while maintaining essential animal care operations. These ranged from shift changes to last-resort measures such as culling animal colonies to comply with reduced staffing regulations. As a result, laboratory animal personnel experienced increased stress, isolation, and helplessness, all of which could increase CF risk. To gauge whether CF had risen among laboratory animal personnel due to the pandemic, 200 individuals involved with animal research were recruited for an online survey. The survey consisted of questions examining professional quality of life, self-assessed levels of CF, institutional changes, perceived changes in animal welfare, and institutional measures enacted to alleviate CF. 86.4% of participants experienced CF at some point in their career, with 41.2% experiencing a CF event (new or worsening symptoms of CF) during the pandemic. 89.7% of participants that reported a CF event also reported an impact on their personal or professional lives as a result. Health, employment, and animal-related stressors that arose due to the pandemic significantly impacted CF scores. 95.7% of respondents were considered essential workers, but 67% did not feel as valued for their work as other essential personnel. 88% of personnel responsible for the euthanasia of healthy animals who experienced a CF event also reported that CF impacted their personal life, professional life, or both. 78.2% responded that interventions from internal CF programs or leadership did not help alleviate CF symptoms. The COVID-19 pandemic and resultant institutional changes will likely have lasting impacts on individuals and organizations. By determining and subsequently mitigating sources of CF, we can better assist the laboratory animal community through future crises.

P352 Optimizing a Rat Surgical Model for Recurrent Laryngeal Nerve Regeneration Strategies

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During anterior neck operative procedures in human and animal patients, the recurrent laryngeal nerve (RLN) is at risk for surgical sacrifice and iatrogenic injury, leaving a gap in the nerve that requires nerve grafting. However, recovery of the RLN may take several months to years and full return of normal physiologic function rarely occurs, resulting in lifelong dyspnea, dysphagia, and dysphonia. Therefore, we sought to establish a rat surgical model of RLN transection with nerve grafting repair to optimize our novel intraoperative vagal nerve stimulation (iVNS) treatment strategy, with the goal of restoring normal laryngeal function. In our pilot study, we performed ventral neck surgery on 10 Sprague Dawley male rats, which all underwent right-sided RLN transection and conduit repair with hydrogel. All 10 rats were food restricted for 4-6 h prior to being anesthetized intraperitoneally with Ketamine + Xylazine for the microsurgery and laryngoscopies. During the surgical procedure, 5 of the 10 rats had iVNS for 30 min immediately after nerve repairment, while the remaining 5 rats underwent sham-treatment for 30 min without electrical stimulation. Behavioral assays were performed to determine upper airway function prior to and following surgery; laryngoscopy, video-fluoroscopy, and whole-body plethysmography were used to assess vocal fold (VF) motion, swallow function, and respiratory function, respectively. The immediate post-surgical results showed that RLN transection created ipsilateral VF paralysis and laryngeal adductor reflex (LAR) impairment. Thus far, our preliminary data demonstrates evidence of bilateral VF movement and improved LAR/airway protection in both groups of rats, but to varying degrees. Monthly testing will continue until 4 mo post-surgery. Additionally, our plan is to create another cohort to increase group sample sizes for statistical analysis. This study is a work in progress for surgical protocol refinement and method development to promote long-term survival and analyze in-depth characterization of neuromuscular recovery and treatment effects. We envision this rat surgical model of RLN transection with nerve grafting repair will serve as a translational platform to investigate a variety of therapeutic interventions that may ultimately accelerate and improve restoration of laryngeal functions in human and veterinary patients.

P353 Sex Differences in the Role of Vascular Endothelin-1 in Diabetic Kidney Disease

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Renal diseases progress faster in males than females; however, diabetic kidney disease advances at a similar rate in both sexes. In type 1 diabetes, little or no insulin is produced, resulting in high blood glucose. Endothelin-1 (ET-1) is a vasoactive peptide critical in kidney injury. In the kidney, endothelial and tubular cells produce ET-1. ET-1 is important in diabetic kidney disease; however, whether there are sex differences in the role of vascular ET-1 in the development of diabetic nephropathy remains unclear. We