American Academy of Veterinary Pharmacology and Therapeutics
Special Online Student Research Symposium
May 20, 2022
11:00 AM – 4 PM Eastern Time (US and Canada)

Join Zoom Meeting
https://us02web.zoom.us/j/86457513711

Meeting ID: 864 5751 3711

11 AM: Introductory Remarks and Member Sign-on

11:15 AM – 12:45 PM: Abstract Presentations (15 minutes each)

Christopher Zdyrski. A Novel 3D Organoid Model to Study P-Glycoprotein Interactions in Preclinical Research. Iowa State University; PI: J. Mochel

Dr. Emma Price. Development of a preliminary benchmark of patient days of antimicrobial therapy in cats and dogs at a tertiary veterinary hospital. Tufts University; PI: C. Fellman

Dr. Emily Richards. Florfenicol Milk and Tissue Depletion Profiles Following Subcutaneous Administration to Goats. University of California, Davis; PI: L. A. Tell

Dr. Kommineni Susmita. In vitro studies on the effect of caffeic acid on the antibacterial activity of cefotaxime. NTR College of Veterinary Science Gannavaram; PI:

Dr. JD Foster. Population pharmacokinetic analysis of enrofloxacin and its active metabolite ciprofloxacin following intravenous injection in cats with reduced kidney function. Friendship Hospital for Animals; PI: M. Abouraya

Dr. Melissa Mercer. Pharmacokinetics and Clinical Efficacy of Acetaminophen (Paracetamol) in Adult Horses with Mechanically Induced Lameness. Virginia Tech; PI: J. Davis

12:45 – 1:00 PM: Break

1:00 – 2:30 PM: Abstract Presentations (15 minutes each)

Lilly Smith. The Pharmacokinetics of intranasal administration of flunixin meglumine in grower pigs. North Carolina State University; PI: K.M. Messenger

Paula Ichinose. Fenbendazole administration induces Cytochrome P450 1A-dependent enzyme activities in pig liver. Universidad Nacional del Centro; PI: C. Lanusse

Lucila Canton. Quantitative risk assessment for ivermectin residues in bovine and pork tissues. Centro de Investigación Veterinaria de Tandil; PI: C. Lanusse

Bailey Fritz. Determination of milk concentrations and pharmacokinetics of salicylic acid following acetylsalicylic acid (aspirin) administration in postpartum dairy cows. Kansas State University; PI: J. Coetzee

Dariyan Springfield. Evaluating methods to improve the clinical efficacy of butorphanol in healthy dogs. Kansas State University; PIs: B. and K. Kukanich

Ranee Miller. Elimination Kinetics of Subcutaneously Administered Eprinomectin in Plasma and Milk in Dry-Off Dairy Cattle. North Carolina State University; PI: R. Baynes

2:30 – 3:30 PM: Award Presentations

Lloyd E. Davis Award: Dr. Stephen Sundlof

Service Award: Dr. Anthony Lucas

Teaching Award: Dr. Duncan Ferguson

Research Award: Dr. Jonathan Mochel

Presentation: Modeling and Simulation: a Tool for Optimizing Dosing Decisions in Veterinary Medicine.

Abstract Presentation Winners: TBD

FENBENDAZOLE ADMINISTRATION INDUCES CYTOCHROME P450 1A-DEPENDENT ENZYME ACTIVITIES IN PIG LIVER

Ichinose, P.; Miró M.V.; Larsen, K.; Lanusse, C.; Lifschitz, A.; Virkel, G.L.

Addresses: Centro de Investigación Veterinaria de Tandil (CIVETAN) (CONICET-CICPBA-UNCPBA), Facultad de Ciencias Veterinarias, Universidad Nacional del Centro, Tandil, Argentina.
E-mail: paulaichinose@vet.unicen.edu.ar
Telephone number: +5492932500692

Key words: fenbendazole; metabolism; cytochrome P450; induction, pig liver

Fenbendazole (FBZ), a benzymidazole (BZD) drug, is used to control gastrointestinal parasites in continuous administration in swine. This drug undergoes two sequential S-oxidations through mixed function oxidases belonging to the cytochrome P450 (CYP) and flavin-monooxygenase (FMO) families. Also, BZD-containing drugs may induce the CYP1A subfamily. This work aimed to evaluate *in vitro* the effect of FBZ on CYP1A-dependent enzyme activities in pig liver. Five (5) piglets remained untreated (controls) and other six (6) were treated with a FBZ commercial powder mixed with food, in two dosing events repeated for 10 consecutive days, as usually is recommended. Both groups were fed *ad libitum* for 10 days and then euthanized for preparation of liver microsomes. FBZ and its metabolites, oxfendazole (OFZ) and fenbendazole sulphone ($FBZSO_2$), were detected in the systemic circulation of treated piglets. Mean plasma AUCs (μg.day/mL) were 0.28±0.08 (FBZ), 4.10±0.58 (OFZ) and 4.56±1.01 ($FBZSO_2$). Concentrations (μg/g) of FBZ, OFZ and $FBZSO_2$ in liver parenchyma were 4.66±1.59, 3.11±1.06 and 2.30±0.99, respectively. In liver microsomes from treated animals, CYP1A-dependent enzyme activities, 7-ethoxuresorufin O-deethylase and methoxyresorufin O-demethylase, increased 24.5-fold (p=0.003) and 17.2-fold (p=0.001), respectively. The participation of the CYP pathway in the S-oxidation of FBZ into OFZ was also enhanced (3.4-fold, p=0.004) in piglets which received the anthelmintic with food (61.8±19.5 pmol/min.mg) compared to controls (18.0±6.0 pmol/min.mg). Thus, FBZ may auto-induce its own metabolism though the CYP1A pathway. This fact may also affect the fate of other xenobiotics that share the same metabolic pattern, like aflatoxin B1 present in certain pig foodstuffs.