



The HARCC Herald

SUMMER 2024

THE ULTIMATE GOAL:

Healthy, Happy Pet Birds



McKayla Miller



Dr. Cheryl Greenacre

In the Beginning

Harrison Avian Research and Conservation Collaboration (HARCC) is a non-profit corporation resulting from a donation to Dr. Greg Harrison from David Nusbaum, a devoted caretaker of his umbrella cockatoo, Snowflake. For the first time, in addition to avian research projects, funds have been directed to a specific conservation organization.



Miriam Walling

New Projects Funded for 2024

• Conservation of Macaws in Honduras

One Earth Conservation

“Thank you so much for your very generous 2024 donation in support of the work of One Earth Conservation. Your timing of this grant couldn’t be better, as the needs of our field projects have exploded over the past year with inflation and our efforts to curtail trafficking and to care for higher numbers of rescued, injured, and confiscated parrots.



Gail Koelln, MS and Rev. Dr. LoraKim Joyner,
Co-Directors of One Earth Conservation



For example, we are protecting over 130 scarlet macaw nests in Honduras and lack enough funds to manage such a large project beyond the current year. One Earth Conservation is the biggest employer in this part of Honduras and our project not only safeguards parrots but also local families and children. This is to say that your grant will have a positive impact on our work in 2024 and beyond!”



• Pharmacokinetics of Amoxicillin-Clavulanic Acid in Domestic Chickens After Multiple-day Oral Dosing of Two Different Formulations

Cheryl Greenacre, DVM, DABVP (Avian), DABVP (Exotic Companion Mammal) - Professor Emeritus, University of Tennessee

Individual (pet, companion, backyard, small flock) chickens are being presented to avian veterinarians frequently, and there are few antibiotics that are labeled or can be used in an extra-label manner in chickens, meaning it is all the more important to have confidence the appropriate dose is being given based on a PK study.

A previous pharmacokinetic (PK) study in domestic chickens showed that after 9 doses of the pill form of amoxicillin-clavulanic acid administered at 150 mg/kg every 12 hours, therapeutic plasma concentrations (0.5 µg/ml) were never reached, and no amoxicillin was detectable in the plasma after 2 hours.¹ The results of this previous PK study caused

avian veterinarians to question the efficacy of this long standing published dose. Some practitioners are now using 250 mg/kg q12h with no evidence-based data to prove efficacy at this dose.

We plan to repeat the study in domestic chickens using a higher dose (250 mg/kg orally every 12 hours for 9 doses) and comparing the plasma concentrations of amoxicillin after being administered the pill or liquid formulation of commercially available Clavamox. The study will be conducted in collaboration with East Tennessee Clinical Research, Inc. and the University of Tennessee Pharmacology Laboratory.



I. Shannon L, Cox SK, Bailey J, Fortner C, Davis R, Gerhardt L, Souza MJ. Pharmacokinetics and Drug Residue in Eggs After Multiple-Day Oral Dosing of Amoxicillin-Clavulanic Acid in Domestic Chickens. *J Avian Med Surg.* 2020 Mar 29;34(1):3-8. doi: 10.1647/1082-6742-34.1.3. PMID: 32237676.

• Effects of Atorvastatin, Rosuvastatin and Pravastatin on Blood Lipids in Cockatiels (*Nymphicus hollandicus*)

Hugues Beaufrère, DVM, PhD, DACZM, DABVP (Avian), Dip ECZM (Avian) – University of California, Davis

Statins are hypolipidemic and anti-atherosclerotic drugs widely and commonly utilized in human medicine to treat dyslipidemias. Nevertheless, their efficacy on lowering blood lipids has not yet been conclusively demonstrated in psittacine birds despite several published experiments

in Amazon parrots and Quaker parrots. The goal of this study will be to test the lipid and non-lipid effects of atorvastatin, rosuvastatin and pravastatin on blood lipids and metabolites on a research population of cockatiels (*Nymphicus hollandicus*) at higher doses than previously used. The research



objectives of this study will be as follows:

- To measure and quantify the plasma lipid effects of three different statin drugs (atorvastatin, rosuvastatin and pravastatin) administered orally at different doses.
- To estimate oral dose equipotency of 3 different statin treatments.

• Investigation of Side Effects of Using Intravenous Honey Infusion Therapy to Treat Avian Veterinary Patients

Jörg Mayer, Dr med vet, MSc, DABVP (ECM), DECZM, DACZM, DACEPM - University of Georgia

This is a primary toxicology study to show that the use of honey as an intravenous treatment does not cause any adverse effects in the patient. While research studies on mammals are available that document the use of IV honey as a treatment modality, no publication is available on the use of this modality in birds. We are planning two toxicology studies: acute and chronic. We will

use chickens as a model with the cooperation of the UGA Poultry Research Center and our own honey produced at the university. The idea of the study is to show that the use of honey as a slow IV infusion is safe and can be potentially used to boost the immune system in affected birds and can be considered as an adjuvant modality in cancer treatments.





• Avian Cervical Spinal Anatomy and Applications Towards Understanding Intervertebral Diseases

M. Scott Echols, DVM, DABVP (Avian) – Scarlet Imaging, The Medical Center for Birds

In this ongoing study, we are making numerous anatomical discoveries in the neck region alone. Case analysis of avian cervical disease (based off CT scans) is suspected to show correlation between cervical and other diseases (such as feather damaging, mutilation, pain).

This particular study will focus on the

cervical region and involve at least two parrot species (golden conure and grey parrot). With the first goal to define cervical anatomy, the second is to make clinicians aware of cervical spinal disease. Once clinicians are aware of the problem, we can work towards better understanding the disease and how it can best be managed.



Golden Conure Vasculature

Updates of 2023 HARCC Funding



• TSH - Stimulation Test with Fresh and Frozen Commercially Available TSH in Quaker Parrots (*Myopsitta monachus*)

Nicola Di Girolamo, DVM, PhD, Dipl ACZM, Dipl ACVPM, Dipl ECZM Cornell University

“Thanks to the HARCC we were able to complete a study investigating the use of a commercially available TSH formulation for thyroid stimulation testing in Quaker parrots. This could allow an affordable way for

diagnosing hypothyroidism in clinical practice. Findings from this study were presented at the 2024 AAV annual conference, and are in the process of being published on a peer-reviewed journal.”



• ¹⁸F-Sodium Fluoride Positron Emission Tomography/Computed Tomography Imaging of Arterial Calcification in Amazon Parrots (*Evaluation of Potential Antemortem Diagnosis of Psittacine Atherosclerosis*)

Hugues Beaufrère, DVM, PhD, DACZM, DABVP (Avian), Dip ECZM (Avian) – University of California, Davis

The project is still ongoing. We have completed all imaging and data acquisition and most image interpretation. Preliminary results show that PET-scan is considerably more sensitive than CT-scan to detect atherosclerosis. We had several birds with atherosclerosis at different anatomical sites and interestingly had several with lesions in the abdominal aorta. We also learned to troubleshoot and optimize the PET-scan protocol (when to image post-injection, best practice to interpret images). This will lead to studies designed to simplify the PET-scan process so the imaging protocol could easily be done for patients in the clinics. This study also confirms the low sensitivity of CT-scans for diagnosing mild to

moderate atherosclerotic lesions even when calcification is detectable with PET-scan imaging.

We also did not find any relationship between blood lipids and atherosclerotic lesions in this cohort of birds, which shows that human risk factors cannot directly be translated to parrots and need further epidemiological research.

The results will benefit avian clinicians in improving the understanding of atherosclerosis in psittacine birds and what imaging techniques can achieve. It also shows that blood lipid risk factors may not be as reliable as in people.

We also realize during this study that the protocol can be logistically challenging to

perform as birds need to have a catheter placed, then injected with the radiotracer, and then re-sedated 2 hours later. In clinics, this would be challenging as there would be a need to maintain an intravenous catheter, poorly tolerated in conscious parrots, for 2 hours. For this reason, we will be conducting a follow up study comparing intravenous injection and intramuscular injection for PET-scan imaging in birds to see whether a simpler protocol, more adapted to companion birds, would lead to similar findings.





• **Effects of Deslorelin Acetate Implants on Blood Lipids and Lipoproteins in Female Cockatiels (*Nymphicus hollandicus*)**

Hugues Beaufrère, DVM, PhD, DACZM, DABVP (Avian), Dip ECZM (Avian) – University of California, Davis

This project is still ongoing. The data collection phase was scheduled to last 6 months, aligning with the reported maximum efficacy duration of deslorelin in cockatiels. Consequently, we do not have data to report at this time. All blood samples collected thus far are stored in an ultra-low freezer

and will be processed in a single batch for blood lipid analysis. The steroid panel by metabolomics, to be performed at the West Coast Metabolomics Center, may have a turnaround time of up to 6 months. We anticipate having results available once data collection is complete and blood



sample analysis performed. We expect that this study will provide clearer guidelines on how to use deslorelin to treat high blood cholesterol in female cockatiels with potential applications to other psittacine birds.

• **Using the Scarlet Animal Preservation System for In-depth Study of Avian Surgical Anatomy and Procedures**

M. Scott Echols, DVM, DABVP (Avian) – The Medical Center for Birds

We need basic anatomy information to perform our job as avian clinicians. Our current anatomy texts tend to be an amalgamation of data from numerous species creating information that is not only very superficial, it can also be misleading and not representative of any one bird. One of the goals of the Grey Parrot Anatomy Project is to create an accurate anatomy resource focused on one species.

This project is relatively new. However, we have made several discoveries. Our dissections have been mostly performed on grey parrots (in conjunction with the Grey Parrot Anatomy Project). However, we are also using CT data of submitted cases for review.

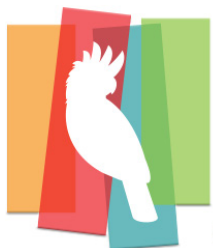
Preliminary findings show the avian cervical anatomy is not well documented and that cervical spinal disease can be found in numerous avian species (focus has been on parrots). One of the donated golden conures was given BriteVu and then micro CT scanned to show the vasculature. Three other birds were stained using a new stain (Scarlet Tissue Stain) and system to visualize the soft tissues and nerves using micro CT. Detailed information (vasculature, nerves, muscles) has been currently documented only at the superficial level.



Example of vascular map BriteVu Scarlet Imaging in a blue and gold macaw



Visit us at www.harccresearch.org



HARCC

Harrison Avian Research & Conservation Collaborative

3610 South Ocean Blvd, Unit 601

South Palm Beach, FL 33480 • www.harccresearch.org

Do you have a proposal or an idea for a research project relevant to avian clinicians? Send an email requesting further information to dperez@harccresearch.org.