

FVSP Faculty Application Checklist-DUE 1/19/2024 5PM EST

X Completed cover page with prior mentorship history

X Training/Registration requirements needed

X Abstract of proposed work

X NIH-format biosketch

Submission Instructions

Convert the application to *one .pdf document*. Name the file using your last name, followed by an underscore, and your first initial. For example: Martyniuk_C.pdf

Submit the following pages, via email attachment, to Dr. Chris Martyniuk (cmartyn@ufl.edu). The subject line should read “FVSP Faculty Application”.

The FVSP Research Program runs 5/27/2024 to 8/07/2024 with final research presentations prior to the national symposium.

2024 Linda F. Hayward Florida Veterinary Scholars Program Faculty Application

Name	Cleverson de Souza
Email address	cdesouza@ufl.edu
Proposed project title	Enhancing Veterinary Education through AI: Evaluating the Impact of a GPT-4 Chatbot in Clinical Pathology Learning
Will you provide matching student stipend funding (\$3250)?	Yes
Source of project/research funding	Department competitive funds Start up funds

Prior student research mentees (last 5 years, if applicable):

CLASS	STUDENT	PROJECT TITLE	STATUS
e.g. 2016			Completed/published/in progress

I am a new faculty member at UF. I have successfully mentored several graduate and undergraduate students throughout my life, and I am positive I can perform similarly at UF.

If project qualifies for Morris Animal Foundation Student Scholarship Funding and you have identified a specific interested student, please provide their name and email address

LAST NAME	FIRST NAME	EMAIL ADDRESS

I agree to obtaining all necessary approvals (e.g. IACUC/IRB/EH&S/VHRRRC – see below for specifics) to conduct the project with the student PRIOR to the commencement of the summer program, as well as submitting documentation of these approvals to the FVSP board by 5/11/2024

YES

I agree to assisting my student prepare for the summer program during the Spring semester, which will include preparation of a study outline, and training in relevant laboratory techniques

YES

I agree to plan for commencing the experiment/data collection by the beginning of the summer program (5/22/24)

YES

I agree to be available to the student throughout the summer to assist with the experiment/data collection, preparation of the manuscript and poster.

YES

	Needed (Yes/No)	Approval by 5/11/24 (Yes/No)?
IACUC Approval and Training	No	
IRB Registration and Training	No	
Biological Agent Registration	No	
Biopath Registration	No	
Veterinary Hospital Research	No	
FERPA Training	No	
Biohazardous Waste Training	No	
Laboratory Safety Training	No	

Abstract of proposed student project (1 page limit. This should mirror the aims page of a grant and CLEARLY indicate the student's role.)

Title: Enhancing Veterinary Education through AI: Evaluating the Impact of a GPT-4 Chatbot in Clinical Pathology Learning

Background: The rapid evolution of artificial intelligence (AI) and its application in veterinary education highlight a critical need to explore and validate new pedagogical tools for teaching the next generation of veterinary students. AI chatbots, already impactful in healthcare, hold promise in veterinary medicine by potentially streamlining clinical workflows, enhancing patient care, and improving diagnostic accuracy. These technologies are poised to transform educational methodologies by facilitating team-based learning, allowing students to better consolidate knowledge, and providing realistic simulation scenarios. The current pedagogical landscape necessitates rigorous testing of these chatbots to ensure they meet educational objectives while addressing the challenges of information accuracy, privacy protection, bias mitigation, and ensuring equitable access. *The successful integration of AI chatbots in veterinary curricula could significantly augment learning experiences and prepare students for a technologically advanced healthcare environment.*

Objectives and Hypothesis: This study aims to evaluate the efficacy of a GPT-4-based chatbot as a teaching aid in the clinical pathology curriculum for second-year veterinary students. Objectives include assessing the feasibility of chatbot integration into existing educational frameworks and gauging its utility as a learning tool compared to traditional study methods. *Our hypothesis posits that students will demonstrate a greater preference for, and potentially better learning outcomes with, the chatbot-assisted methodology over conventional reading materials.* The study will measure student engagement, comprehension, and the ability to apply knowledge gained through the use of the chatbot, with the overarching goal of enhancing the quality and efficiency of veterinary education.

Aims: In our study, 60 veterinary students will first be collectively introduced to a GPT-4-based chatbot, highlighting its features and use best practices for educational support in clinical pathology. Their initial perceptions will be assessed through a structured survey. Subsequently, the cohort will be randomly divided into two groups for a controlled experiment: one group will study a designated topic via the chatbot, and the other through traditional materials for two hours. A standardized multiple-choice test will follow to measure knowledge retention and comprehension. This process will be repeated with the groups swapping study methods utilizing a new learning topic. Post-study surveys will then capture detailed feedback on the chatbot's helpfulness, ease of use, engagement, and information accuracy. The comparative analysis of test scores and survey responses will inform the effectiveness and student receptivity towards the chatbot as a learning tool.

Student role: In the proposed GPT-4 chatbot project, the assisting student will take on a critical role encompassing both administrative and academic responsibilities. They will spearhead the recruitment of student participants, ensuring a diverse and representative sample for the study. Additionally, the student will manage logistics, coordinating the smooth execution of the project's various phases. Academically, they will support the data analysis process, working alongside the research team to interpret findings, and will contribute to the drafting and revision of the research manuscript, providing valuable input for scholarly dissemination. This multi-dimensional involvement is designed to enrich the student's experience in research practices and project management.

Biographical Sketch

Name: de Souza, Cleverson

Date: 01/17/2024

Position Title: Associate Professor

Department/School: Department of Comparative Diagnostic and Population Medicine, UF, Gainesville, FL

Education/training

Institution and location	Degree	Year	Field of study
Federal University of Parana, PR, Brazil	DVM	1999	Doctor of Veterinary Medicine
University of Sao Paulo, Sao Paulo, Brazil	Specialist	2001	Veterinary Clinical Pathology
Federal Univ. of Santa Maria, RS, Brazil	MSc	2003	Immunology/Infectious disease
University of Minnesota, St Paul, MN, USA	Ph.D.	2008	Immunology/Infectious disease
University of Minnesota, St Paul, MN, USA	Specialist	2009	Veterinary Clinical Pathology
American College of Veterinary Pathology	Certified	2011	Veterinary Clinical Pathology

A. Personal statement and contribution to science:

Dr. Souza, a recognized veterinary clinical pathologist, has dedicated his career to advancing the field through both academic and practical avenues. With a profound commitment to veterinary science, his expertise spans the intricate relationships between host-pathogen interactions, notably in *Mycobacterium avium* subsp. *paratuberculosis* infection. His career is marked by a relentless pursuit of knowledge, improvement of veterinary clinical practices, and a deep-seated passion for teaching and mentoring the next generation of veterinary professionals.

Dr. Souza's contributions to science are multifaceted as evidenced by his publications, reflecting his broad expertise in veterinary pathology. His significant achievements include groundbreaking research on host-pathogen interactions, particularly in the context of *Mycobacterium avium* subsp. *paratuberculosis*, leading to valuable insights into the immune responses in infected animals. He has also made advancements in the development of diagnostic and therapeutic strategies for animal diseases, leveraging his expertise in veterinary pathology and immunology. Dr. Souza's commitment to education is evident in his extensive teaching and mentorship activities, where he has shaped the careers of numerous veterinary students and professionals. His scholarly works, including numerous peer-reviewed publications and presentations at international conferences, underscore his contributions to his field.

Professional positions

Associate Professor of Veterinary Clinical Pathology, Department of Comparative Diagnostic and Population Medicine, UF, Gainesville, FL, USA, *Jan 2023 to present*.

Associate Professor of Veterinary Clinical Pathology, Department of Veterinary Clinical Sciences, Washington State University, College of Veterinary Medicine, WA, USA, *Jan 2019 to 2022*.

Assistant Professor of Veterinary Clinical Pathology, Department of Veterinary Clinical Sciences, Washington State University, College of Veterinary Medicine, WA, USA, *Jan 2013 to 2019*.

Assistant Professor of Pathology, Department of Anatomy and Pathology University of Fortaleza, School of Medicine, CE, Brazil, *Jan 2009 to Dec 2012*.

Adjunct Professor, UniChristus, CE, School of Dentistry, Brazil, *Sep 2010 to Dec 2012*.

Adjunct Professor, Department of Pathology and Legal Medicine, Federal University of Ceara, School of Dentistry, CE, Brazil, *Jan 2010 to Dec 2012*.

Veterinary Clinical Pathologist, Laforvet (private diagnostic lab), *Jan 2009 to Dec 2012*.

Assistant Professor of Veterinary Clinical Pathology, Faculty of Veterinary Medicine, University of Passo Fundo, RS, Brazil, *Jun 2002 to Sept 2003*.

Honors

Newbrey teaching Scholar at WSU, 2016

CAPES, Full Scholarship (PhD studies) - \$125,000, 2004 to 2008

CAPES, Full Scholarship (MS studies) - \$ 35,000, 2000 - 2001

Selected peer review publication (selected from 50)

Michelle Athena Decourcey, William Charles Davis & Cleverson de Souza* **Use of RNA-seq to identify genes encoding cytokines and chemokines activated following uptake and processing a candidate peptide vaccine developed against *Mycobacterium avium* subsp. paratuberculosis**. *Braz J of Vet Med*, 46, e002723. <https://doi.org/10.29374/2527-2179.bjvm002723>, 2024.

Meghan Eren, Julianne Hwang, Janean Fidel, Rance Sellon, Cleverson D SOUZA*. **Preliminary evaluation of an autologous dendritic cell vaccine using nanoparticle technology for the treatment of canine malignant melanoma**. *American J of Biomedical and Life Sciences*, 9(1):88-96, 2021

Gaber S. Abdellrazeq, Mahmoud M. Elnaggar, John P. Bannantine, Kun T. Park, Cleverson D. SOUZA, Brian Backer, et al. **A peptide-based vaccine for *Mycobacterium avium* subspecies paratuberculosis**, *Vaccine*, Volume 37, Issue 21, p. 2783-2790, 2019.

Gaber S. Abdellrazeq, Mahmoud M. Elnaggar, John P. Bannantine, Kun T. Park, Cleverson D. SOUZA, et al. **A *Mycobacterium avium* subsp. Paratuberculosis relA deletion mutant and a 35 kDa major membrane protein elicit the development of cytotoxic T lymphocytes with the ability to kill intracellular bacteria**. *Veterinary Research*, 49:53, doi.org/10.1186/s13567-018-0549-3, 2018.

Cleverson D. SOUZA*, John P. Bannantine, Wendy C. Brown, William C. Davis, et al. **A nanoparticle vector comprised of poly lactic-co-glycolic acid and monophosphoryl lipid A and recombinant *Mycobacterium avium* subsp paratuberculosis or *Anaplasma marginale* peptides stimulate a pro-immune profile in bovine macrophages**. *Journal of Applied Microbiology*, *doi: 13491*, 2017.

Guldner D, Hwang JK, Cardieri MCD, Eren, M, Ziaei P, Norton MG, SOUZA. CD*. **In vitro evaluation of the biological responses of canine macrophages challenged with PLGA nanoparticles containing Monophosphoryl Lipid A**. *PLoS One*, (11), 2016.

Research support

2022-2023 Transcriptomic Analysis to Identify Genes Associated with Thrombosis and Coagulation in Lipopolysaccharide-Exposed Bovine Monocyte-Derived Macrophages",

	\$5,000 Cohen, H (P.I.), SOUZA, CD (M.S. major student advisor), - completed.
2020-2022	Stanley L Adler Research Fund. Evaluation of gene expression profiling as a predictor of prognosis and response to therapy in dogs with B cell lymphoma undergoing CHOP therapy – A pilot study", \$14,562, SOUZA, CD (P.I.), - completed
2019-2020	Assessment of the capacity of dendritic cells incubated with melanocyte tyrosinase antigen containing-PLGA/MPLA nanoparticles to stimulate lymphoproliferative responses in dogs, \$7,000, SOUZA, CD (M.S. major student advisor) & Michelle Decourcey– completed
2018-2020	Autzen Endowment. Evaluation of the capacity of blood and monocyte-derived dendritic cells pulsed with canine melanoma antigen containing-nanoparticles to stimulate lymphoproliferative responses and INF- γ production in dogs, \$14,627, SOUZA, CD (P.I.) – completed
2017-2018	Effects of Ionizing Radiation on Lymphocyte Profiles in Cancer-Bearing Dogs, \$20,000, Fidel, J (P.I.), SOUZA, CD (M.S. major student advisor)- completed
2017-2018	Evaluation of a novel cell-based melanoma vaccine in dogs – A pilot study, \$7,000, SOUZA, CD (M.S. major student adviser) & Meaghan Eren - completed.
2016-2017	Marge Crowley Canine Cancer Research Endowment. Safety, tolerability, and effectiveness of a nanoparticle-based dendritic cell vaccine using whole tumor lysate in canine patients with stage I- IV malignant melanoma- Pilot Study, \$20,000 SOUZA, CD. (P.I.) – completed
2015-2016	PLGA-nanoparticles that induce protective macrophage responses to <i>Mycobacterium paratuberculosis</i> ." \$20,000 – SOUZA, CD. (P.I.) - completed
2014-2015	Evaluation of canine macrophage responses against <i>Mycobacterium paratuberculosis</i> . \$7,000, SOUZA, CD (Major MS student advisor) & Guldner, D - completed.
2013-2014	The bacterial cell wall glycolipid ManLam of <i>Mycobacterium paratuberculosis</i> modulates immunity in cattle. \$20,000 – SOUZA, CD. (P.I.) - completed
2013-2015	WSU Office of Grant & Research Development (OGRD). "Studies on bovine immunity using relA-deficient <i>Mycobacterium paratuberculosis</i> organisms.", \$21,000 - SOUZA, CD. (P.I.) - completed
2010-2011	FUNCAP – Fortaleza, C.E., Brazil "Prevalence of Paratuberculosis in C.E. and functional studies of MAP-infected monocytes in small ruminants." FUNCAP -, \$20,000 - SOUZA, CD, (P.I.) - completed
2007-2009	USDA-CSREES-NRI 2004-35605-14243 Host response to <i>Mycobacterium paratuberculosis</i> : Role of MAPK-p38 and interleukin-10, \$22,000, 147 - SOUZA, CD, (CO-PI) - completed
2004-2007	USDA-NRI/AFRI- "Bovine mucosal immune response to <i>Mycobacterial paratuberculosis</i> : Role of interleukin-10 and CD25 ⁺ T cells". USDA \$ 350,000, 2005 - 2008, (Research fellow) – completed