

Anoud Ailabouni, Ph.D

Assistant Professor

Department of Pharmaceutical Technology

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Professional Summary

Assistant Professor in the Department of Pharmaceutical Technology at Jordan University of Science and Technology. Earned a Bachelor's degree in Pharmacy and a Master's degree in Pharmaceutical Technology from Jordan University of Science and Technology, followed by a Ph.D. in Pharmaceutical Sciences from Washington State University.

Ph.D. research focused on investigating the effects of genetic variation, age, and transporter inhibition on metformin pharmacokinetics across preclinical, clinical, and pediatric populations. Research expertise includes LC-MS/MS bioanalysis, metabolomics, transporter assays, pharmacokinetic analysis, and mechanistic pharmacokinetic modeling, including physiologically based pharmacokinetic (PBPK) and population pharmacokinetic (PopPK) modeling.

Master's research focused on formulation development and enhancement of poorly soluble drugs using solid dispersion technologies.

Education

- Ph.D. **Pharmaceutical Sciences and Molecular Medicine**, *January 2022-May 2025***
Washington State University, Spokane, WA, USA
Thesis Title: "Variability in metformin pharmacokinetics: Influence of cimetidine coadministration, genetic polymorphisms, and age"
Research Advisor: Dr. Bhagwat Prasad, Bhagwat.Prasad@cchmc.org
- M.Sc. **Pharmaceutical Technology**, *September 2013-January 2016***
Jordan University of Science and Technology, Irbid, Jordan
Thesis Title: "Preparation and evaluation of solid dispersions of celecoxib"
Research Advisor: Dr. Rana Obeidat, Rana.Obeidat@jfda.jo
- B.Sc. **Pharmacy**, *August 2008- June 2013***
Jordan University of Science and Technology, Irbid, Jordan

Experience

Assistant Professor | Jordan University of Science and Technology

February 2026 – Present

Biopharmaceutics & Pharmacokinetics

- Undergraduate course for Pharmacy and Pharm D students
- Teach undergraduate PharmD students principles of drug absorption, distribution, metabolism, elimination, bioavailability, and bioequivalence.
- Instruct students in pharmacokinetic calculations for blood and urine drug concentration data following single and multiple dosing regimens.

Clinical Pharmacokinetics

- Undergraduate course for PharmD students
- Teach application of pharmacokinetic principles to optimize individualized drug dosing regimens using therapeutic drug monitoring (TDM).
- Guide students in clinical case-based problem solving related to dosing adjustments and pharmacokinetic variability.

Pharmacy Training I

- Undergraduate course for Pharmacy and Pharm D students
- Supervise introductory pharmacy practice training across hospital, community pharmacy, industry, and simulation laboratory settings.
- Mentor students in patient communication, professional ethics, interprofessional collaboration, and early clinical practice skills.

Lecturer | Jordan University of Science and Technology

February 2016 – August 2021

Pharmacy Practice Laboratory

- Undergraduate course for Pharm D students
- Taught laboratory applications related to physical pharmacy, industrial pharmacy, and dispensing practices.
- Provided hands-on training in pharmaceutical preparations, compounding of dosage forms, dissolution testing, rheology, micrometrics, and quality control of pharmaceutical formulations.

Pharmaceutical Microbiology & Biotechnology Laboratory

- Undergraduate course for Pharm D students
- Delivered practical training in pharmaceutical microbiology and biotechnology laboratory techniques for undergraduate pharmacy students.
- Supervised laboratory experiments and supported students in developing technical and analytical laboratory skills.

Research Experience

Ph.D. in Pharmaceutical Sciences and Molecular Medicine

Washington State University, Spokane, WA, USA

Advisor: Dr. Bhagwat Prasad

January 2022 – May 2025

Thesis Title: *Variability in Metformin Pharmacokinetics: Influence of Cimetidine Coadministration, Genetic Polymorphisms, and Age*

Research Focus

Investigated the impact of transporter inhibition, genetic polymorphisms, and age-related physiological variability on metformin pharmacokinetics and endogenous organic cation transporter (OCT) biomarkers using clinical, preclinical, and mechanistic modeling approaches.

Research Highlights

- Conducted clinical and preclinical studies evaluating the effects of cimetidine-mediated OCT/MATE inhibition on metformin disposition and endogenous metabolite profiles.
- Performed LC-MS/MS bioanalysis of plasma and urine samples from rats, healthy adults, and pediatric patients.
- Applied untargeted metabolomics approaches to identify endogenous biomarkers of renal OCT/MATE transporters.
- Developed and validated bioanalytical methods for the quantification of metformin and endogenous transporter substrates.
- Investigated the influence of transporter genetic polymorphisms (OCT1, OCT2, MATE1, and MATE2K) on metformin pharmacokinetics and drug-drug interactions.
- Developed physiologically based pharmacokinetic (PBPK) models using Simcyp® to quantitatively predict transporter-mediated drug-drug interactions.
- Conducted transporter uptake and inhibition assays using HEK293 cell lines and recombinant systems to investigate mechanisms underlying altered endogenous biomarker concentrations.
- Characterized interindividual variability in pediatric metformin pharmacokinetics using population pharmacokinetic modeling (NONMEM) and covariate analysis.

M.S. in Pharmaceutical Technology**Jordan University of Science and Technology, Irbid, Jordan**

Advisor: Dr. Rana Obeidat

September 2013 – January 2016

Thesis Title: *Preparation and Evaluation of Solid Dispersions of Celecoxib***Research Focus**

Investigated formulation strategies to enhance the dissolution and physicochemical properties of celecoxib using solid dispersion techniques.

Research Highlights

- Prepared celecoxib solid dispersions using multiple polymers, including Soluplus®, polyvinylpyrrolidone, and polyethylene glycol.
- Evaluated formulation approaches using vacuum drying and rotary evaporation techniques.
- Characterized physicochemical properties of formulations using Powder X-ray Diffraction (PXRD), Differential Scanning Calorimetry (DSC), Fourier Transform Infrared Spectroscopy (FTIR), and Scanning Electron Microscopy (SEM).
- Conducted in vitro dissolution studies to compare drug release profiles across formulations and commercially available products.
- Assessed formulation stability using accelerated stability testing methods.

Awards and Honors

- 2025-Student Excellence Award for Leadership, College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA
- 2024- 1st place in graduate poster competition, Pacific Northwest Association of Toxicologists (PANWAT) meeting, Lynnwood, WA, USA
- 2024- 1st place in graduate poster competition, Research Day, College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA
- 2024- 1st place in 3-minute thesis competition, College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA
- 2024- Travel award from ASPET to attend ASPET meeting in Arlington, VA, USA
- 2023- 2nd place in graduate poster competition, Research Day, College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA
- 2023-Travel award from ASPET to attend ASPET meeting in St Louis, MO, USA
- 2021- Full scholarship sponsored by Jordan University of Science and Technology to pursue a doctoral degree in Pharmaceutical Sciences at Washington State University
- 2017- Best Master's Thesis, JUST Excellence in Graduate Research, Jordan University of Science and Technology, Irbid, Jordan

Peer-Reviewed Publications

1. **Ailabouni, A.** and Prasad, B., 2025. Organic cation transporters 2 (OCT2): Structure, regulation, functions, and clinical implications. *Drug Metabolism and Disposition*, 53(3), p.100044.
2. **Ailabouni, A.S.**, Vijaywargi, G., Subash, S., Singh, D.K., Gaborik, Z. and Prasad, B., 2025. Is N 1-Methylnicotinamide a Good Organic Cation Transporter 2 (OCT2) Biomarker?. *Metabolites*, 15(2), p.80.
3. **Ailabouni, A.S.**, Singh, D.K., Thakur, A., Boone, E.C., Gaedigk, A. Paine, M.F., and Prasad, B., 2025. Quantitative contributions of hepatic and renal organic cation transporters to the clinical pharmacokinetic cimetidine-metformin interaction. *Clinical Pharmacology & Therapeutics*.
4. **Ailabouni, A.S.**, Mettu, V.S., Thakur, A., Singh, D.K. and Prasad, B., 2024. Effect of cimetidine on metformin pharmacokinetics and endogenous metabolite levels in rats. *Drug Metabolism and Disposition*, 52(2), pp.86-94.
5. AlSheyyab, R.Y., Obaidat, R.M., Altall, Y.R., Abuhuwaij, R.T., Ghanma, R.R., **Ailabouni, A.S.**, Mashaqbeh, H.A. and Al-Haj, S., 2019. Solubility enhancement of nimodipine through preparation of Soluplus® dispersions. *Journal of Applied Pharmaceutical Science*, 9(9), pp.030-037.
6. Obaidat, R.M., AlTaani, B. and **Ailabouni, A.**, 2017. Effect of different polymeric dispersions on in-vitro dissolution rate and stability of celecoxib class II drug. *Journal of Polymer Research*, 24(4), pp.1-14.

Manuscripts accepted for publication

7. **Anoud Sameer Ailabouni**, Kelsee Halpin, Erin C. Boone, Andrea Gaedigk, Takanobu Nadai, Kei Irie, Tomoyuki Mizuno, Steven J. Leeder, and Bhagwat Prasad. Interindividual variability in metformin pharmacokinetics in pediatric patients.

Conferences and Meetings

1. **Pacific Northwest Association of Toxicologists (PANWAT) Meeting, “Data to Knowledge to Action”**
September 2024 | Embassy Suites by Hilton Seattle, Lynnwood, WA, USA
 - **Poster presentation:** “Interindividual variability in the disposition and pharmacokinetics of organic cation substrates in humans: Asymmetric effects on systemic and tissue exposures”
 - **Co-authors:** **Anoud Ailabouni**, Dilip Kumar Singh, Aarzoo Thakur, Mary F. Paine, Bhagwat Prasad

2. Industry Advisory Board (IAB) & Research Day

August 2024 | College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA

- **Poster competition:** “Predicting contributions of hepatic and renal organic cation transporters to the clinical pharmacokinetic cimetidine–metformin interaction using a mechanistic PBPK model”
- **Co-authors:** Anoud Ailabouni, Aarzoo Thakur, Dilip Kumar Singh, Mary F. Paine, Bhagwat Prasad

3. American Society for Pharmacology and Experimental Therapeutics (ASPET) Annual Meeting

May 2024 | Hyatt Regency Crystal City, Arlington, Virginia, USA

- **Poster competition:** “Predicting contributions of hepatic and renal organic cation transporters to the clinical pharmacokinetic cimetidine–metformin interaction using a mechanistic PBPK model”
- **Co-authors:** Anoud Ailabouni, Aarzoo Thakur, Dilip Kumar Singh, Mary F. Paine, Bhagwat Prasad

4. Rocky Mountain Discussion Group (RMDG) / American Association of Pharmaceutical Scientists (AAPS) Meeting

September 2023 | Virtual (Zoom)

- **Oral presentation:** “Effect of cimetidine on metformin pharmacokinetics and endogenous metabolite levels in rats.”

5. Industry Advisory Board (IAB) & Research Day

August 2023 | College of Pharmacy and Pharmaceutical Sciences, Washington State University, Spokane, WA, USA

- **Poster competition:** “Identification of endogenous biomarkers of renal organic cation transporters in rats by global metabolomics analysis”
- **Co-authors:** Anoud Ailabouni, Vijay Saradhi Mettu, Aarzoo Thakur, Dilip K. Singh, Bhagwat Prasad

6. American Society for Pharmacology and Experimental Therapeutics (ASPET) Annual Meeting

May 2023 | St. Louis Union Station, St. Louis, Missouri, USA

- **Platform & poster presentation:** “Identification of endogenous biomarkers of renal organic cation transporters in rats by global metabolomics analysis”
- **Co-authors:** Anoud Ailabouni, Vijay Saradhi Mettu, Aarzoo Thakur, Dilip K. Singh, Bhagwat Prasad

7. Pacific Northwest Association of Toxicologists (PANWAT) Meeting

October 2022 | Washington State University, Spokane, WA, USA

- **Poster presentation:** “Effect of cimetidine-mediated inhibition on the levels of exogenous and endogenous substrates of organic cation transporters in rats”
- **Co-authors:** Anoud Ailabouni, Vijay Saradhi Mettu, Aarzoo Thakur, Dilip K. Singh, Bhagwat Prasad

8. JUST International Pharmacy Conference

2017 | Jordan University of Science and Technology, Irbid, Jordan

- **Poster presentation:** “Effect of low molecular weight chitosan on in-vitro dissolution rate and stability of celecoxib (Class II drug)”
- **Co-authors:** Anoud Ailabouni, Rana Obaidat, Bashar AlTaani

9. JUST Second International Conference on Advanced Materials

2017 | Jordan University of Science and Technology, Irbid, Jordan

- **Poster presentation:** “Effect of intermolecular forces between celecoxib and different polymers in dissolution behavior”
- **Co-authors:** Anoud Ailabouni, Rana Obaidat, Bashar AlTaani

10. Applied Science University (ASU) Third Postgraduate Conference

2016 | Amman, Jordan

- **Poster presentation:** “Effect of different polymeric dispersions on in-vitro dissolution rate and stability of celecoxib (Class II drug)”
- **Co-authors:** Anoud Ailabouni, Rana Obaidat, Bashar AlTaani

Workshops and Professional Training

1. Pharmaceutical Good Manufacturing Training

May 2026 | Elevify Online

- **Course chapters:** Introduction, GMP Foundations for Solid Dosage Production, Line Clearance and Mix-up Prevention for Tablet Lines, In-Process Controls and Equipment Operation, Deviation Management and Documentation Practices, Cleaning, Changeover, and Cross-Contamination Control, Communication and Interaction with Quality and Supervision, and Conclusion.

2. ISSX 2024 Virtual Transporter Workshop: Bringing Practical Applications of Endogenous Biomarkers for Drug Transporters a Step Closer: Current Status and Future Perspectives

February 2024 | Virtual workshop (Zoom)

- **Oral presentation:** “Identification of endogenous substrates of renal organic cation transporters as potential biomarkers by untargeted metabolomics analysis of cimetidine-treated rat blood and urine samples”
- **Co-Authors:** Anoud Ailabouni, Vijay Saradhi Mettu, Aarzoo Thakur, Dilip K. Singh, and Bhagwat Prasad

Technical Expertise

Bioanalytical & Metabolomics Techniques

- LC-MS/MS bioanalysis
- Bioanalytical method validation
- Untargeted metabolomics

Clinical pharmacokinetic data analysis

- MATLAB (SimBiology®)
- Monolix®

Pharmacokinetic Modeling

- PBPK modeling (Simcyp®, PK-Sim®)
- Population PK modeling (NONMEM)

In Vitro Experimental Techniques

- Cell culture
- Transporter uptake/inhibition assays
- Enzyme inhibition assays
- In vitro release (dissolution) assay

Multiple Software Experience

- Skyline®
- XCMS online
- GraphPad®.

Formulation Physicochemical Characterization Techniques

- Powder X-ray diffraction
- Differential Scanning Calorimetry
- Fourier Transform Infrared analysis
- Scanning Electron Microscopy

Membership

- International Society for the Study of Xenobiotics (ISSX), since 2023
- American Society for Pharmacology and Experimental Therapeutics (ASPET), since 2022
- Pacific Northwest Association of Toxicologists (PANWAT), since 2022
- Jordan Pharmaceutical Association, since 2013

References

Dr. Rana Obeidat

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