

**UNIVERSITY OF COLORADO, SCHOOL OF MEDICINE
CURRICULUM VITAE**

Alison Xiaoqiao Xie, Ph.D.

1. Current Position Assistant Professor

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2. Education

1997/9-2002/7 B.S. University of Science and Technology of China, Hefei,
Anhui, P. R. China (biophysics)

2003/9-2005/7 M.Sc. University of Science and Technology of China, Hefei,
Anhui, P. R. China (neurobiology and biophysics)

2006/8-2011/8 Ph.D. University of California Riverside, Riverside, CA, USA
(neuroscience)

2011/9-2016/8 Postdoctoral Research Associate, Department of
Pharmacology, School of Medicine, University of North
Carolina at Chapel Hill, Chapel Hill, NC, USA

3. Academic Appointments and Positions

2016/9-2017/2 Research Assistant Professor, Department of Pharmacology,
School of Medicine, University of North Carolina at Chapel Hill,
Chapel Hill, NC

2017/8-2019/9 Instructor, Division of Urology, Department of Surgery, School
of Medicine, University of Colorado, Anschutz Medical
Campus, Aurora, CO

2019/10-present Assistant Professor, Division of Urology, Department of Surgery, School of Medicine, University of Colorado, Anschutz Medical Campus, Aurora, CO

4. Professional Positions

2001/9-2002/7 Undergraduate research assistant, Department of Biology, University of Science and Technology of China, Hefei, Anhui, P. R. China

2002/8-2003/8 Professional Research Assistant, Department of Biology, University of Science and Technology of China, Hefei, Anhui, P. R. China

2003/9-2005/7 Graduate Research and Teaching Assistant, Department of Biophysics, School of Life Sciences, University of Science and Technology of China, Hefei, Anhui, P. R. China

2006/8-2011/8 Graduate Research and Teaching Assistant, Neuroscience Graduate Program, University of California Riverside, Riverside, CA, USA

5. Honors and Awards

2005 Dong-gang Scholarship
University of Science and Technology of China

2014 Excellence in Mentoring Undergraduates
University of North Carolina at Chapel Hill

2016 Young Investigator Travel Award
Federation of American Societies for Experimental Biology (FASEB)
Maximizing Access to Research Careers (MARC) Program

2022 Best Poster Award
American Urological Association (AUA)

2023 Young Investigator Award
Society of Basic Urologic Research (SBUR)

2024 Faculty Professionalism Award
Department of Surgery, School of Medicine, University of Colorado, Anschutz Medical Campus

6. Professional Affiliations

- 2007-2011 Student Member, Society of Neuroscience (SfN)
- 2007- Student and Faculty Member, American Society of Neurochemistry (ASN)
- 2017- Faculty Member, Colorado Clinical & Translational Sciences Institute (CCTSI), Aurora, CO
- 2017- Faculty Member, Center for NeuroScience (CNS), Aurora, CO
- 2018- Faculty Member, American Urological Association (AUA)
- 2018- Faculty Member, South Central Section (SCS) of the American Urological Association (AUA)
- 2019- Faculty Member, Society for Basic Urologic Research (SBUR)
- 2021- Faculty Member, Neuroscience Graduate Program, University of Colorado, Anschutz Medical Campus
- 2024 Faculty Member, Medical Scientist Training Program, University of Colorado, Anschutz Medical Campus
- 2024 Faculty Member, Integrated Physiology Program, University of Colorado, Anschutz Medical Campus

7. Professional Leadership and Service

Departmental and interdepartmental

University of North Carolina at Chapel Hill

- 2013-2016 Mentor, Undergraduate Research
- 2013, 2015 Mentor, Carolina Summer Fellowship Program, Department of Pharmacology, School of Medicine

University of Colorado, Anschutz Medical Campus

- 2022 Member, The Uro Social Media Workgroup, Department of Surgery
- 2022- Research Advisor, Urology resident research Program, Department of Surgery
- 2022- Mentor, Women in STEM (WiSTEM) Mentorship Program

2022, 2024 Judge, Undergraduate Summer Research Symposium
 2024 Co-chair, Neuroscience Graduate Program Retreat
 2024 Steering Committee, Neuroscience Graduate Program
 2024 Steering Committee, Academy of Research Mentoring Educators (ARME), Graduate School, CU-AMC
 2024 Admission Committee, Neuroscience Graduate Program
 2025 Chair, Neuroscience Graduate Program Retreat

National and international

2019/05 Member, Neuroscience in Urology Thank Tank, NIH/NIDDK, Rockville, MD
 2022/09 Moderator, Reconstruction/Neuro-urology Poster Session, South Central Section of the American Urological Association Meeting, Coronado, CA
 2024/04 Co-chair, Foundational Science Session “Peripheral glia take center stage in autonomic functions”, American Physiological Society Summit. Long Beach, CA
 2024/04 Chair, Scientific symposium “The roles of satellite glial cells during development and diseases”. American Society of Neurochemistry meeting, Portland, OR.

Local/community

2010- TED translator (English, Mandarin)
 - Served as volunteer transcriber and translator (from English to Chinese) for scientific talks of TED conferences.
 - Subtitled 55 talks, translated 18 talks, and reviewed translation for 37 talks.
 2018- Judge, Denver Metro Regional Science and Engineering Fair
 - Served as a judge for junior high and high school poster competition every year since 2018.

Professional development and leadership training

2022 Leadership, Empower & Engage, Authenticity & Awareness, Diversity (LEAD) training, University of Colorado, Department of Surgery
 - This training program helps DOS members to develop their leadership identity.

- 2022-2023 Women’s Leadership training, University of Colorado, School of Medicine
- Selected from all women Assistant Professors with primary appointments in the School of Medicine to receive professional development training.
- 2024 Mentoring Academy, Center for the Improvement of Mentored Experiences in Research (CIMER) facilitator training, University of Colorado, School of Medicine.
- Selected from all School of Medicine faculty to receive mentoring facilitators training. The trainees in this program are expected to implement mentorship training at their institution or organization, and therefore increase the capacity for research mentor training offered at colleges and universities, research institutes, and organizations.
- 2024-2025 Striving Towards Excellence Program (STEP) training, Department of Surgery, CU Anschutz.
- Aligned with the departmental mission of “Enlightening Tomorrow’s Leaders,” this 10-module training program assist faculty in developing five essential skills: Communication, Collaboration, Coaching, Change Management and Credibility.

8. Licensure and board certification

Not applicable

9. Inventions, intellectual property, and patents held or pending

Not applicable

10. Review, Referee and Editorial Activities

Editorial board

- 2022- Review Editor, Frontiers in Pain Research
 2022- Review Editor, Frontiers in Systems Neuroscience

Ad hoc manuscript reviewer

- Journal of Visualized Experiments (JoVE)
 Journal of Pain research
 Frontiers in Molecular Neuroscience

Cell Reports

Grant review committees and study sections

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| 2019-2021 | Reviewer, Colorado Clinical and Translational Sciences Institute (CCTSI) Pilot Grant Program |
| 2022 | Reviewer, NIH/CSR Renal/Urological Sciences Small Business Activities Special Emphasis Panel |
| 2023 | Reviewer, NIH/NIDDK Kidney and Urological Systems Function and Dysfunction study section |
| 2024 | Reviewer, NIH/CSR Neurobiology of Pain and Itch study section |

11. Invited Lectures, Presentations, Workshops

Local

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| 2016/04 | Department of Pharmacology Retreat, University of North Carolina at Chapel Hill, Chapel Hill, NC. “Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo” |
| 2016/09 | Department of Pharmacology, University of North Carolina at Chapel Hill, Chapel Hill, NC. “Targeting sympathetic satellite glial cells for treating cardiovascular diseases. |
| 2021/10 | Department of Anesthesiology, University of Colorado, Anschutz Medical Campus, Aurora, CO. “The analgesic role of peripheral GFAP+ glia in vivo” |
| 2022/01 | Neuroscience Graduate Program, University of Colorado, Anschutz Medical Campus, Aurora, CO. “Peripheral glia modulation of autonomic control: from heart to bladder” |
| 2023/10 | Department of Surgery Retreat, University of Colorado, Anschutz Medical Campus, Aurora, CO. “Satellite Glial Cells Regulate Bladder Functions and Pain” |
| 2023/11 | Department of Surgery, Urology resident research seminar, University of Colorado, Anschutz Medical Campus, Aurora, CO. “Research strategies and experimental models used in basic and translational urology research” |

- 2024/01 Department of Surgery, Research seminar series, University of Colorado, Anschutz Medical Campus, Aurora, CO. “Peripheral Glial Signaling Modulates Micturition and Bladder Pain”
- 2024/03 Division of Urology Grand Rounds, Department of Surgery, University of Colorado, Anschutz Medical Campus, Aurora, CO. “The neural (and glial) regulation of bladder functions”
- 2024/09 Integrative Physiology Program, University of Colorado, Anschutz Medical Campus, Aurora, CO. “The Role of GFAP+ Glia in bladder functions”
- 2024/10 Neuroscience Program Retreat, University of Colorado, Anschutz Medical Campus, Estes Park, CO. “Satellite glial regulation of bladder functions”

Regional

- 2016/04 Duke Neuroimmunology and Glia Group Annual Retreat, Duke University, Durham, NC. “Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo”
- 2017/10 Integrative Physiology Program, University of Colorado Boulder, Boulder, CO. “DREADD the Glia: Pharmacogenetic Approaches for Studying the Role of GFAP+ Glia in Physiology and Disease”

National

- 2020/10 South Central Section of the American Urological Association Meeting, Virtual. “Lumbar-sacral neuromodulation alleviates visceral pain and improves lower urinary tract symptoms in animal model of urological chronic pelvic pain syndrome”
- 2022/09 South Central Section of the American Urological Association Meeting, Coronado, CA. “Modulation of Sensory Glia Gq-GPCR Signaling in vivo Affects Spontaneous Voiding and Bladder Function in an Animal Model of Chronic Pelvic Pain”
- 2023/11 Department of Biology, Johns Hopkins University, Baltimore, MD. “Probing the roles of satellite glial signaling in vivo and in physiology”

International

- 2014/07 Cold Spring Harbor Laboratory Glia in Health & Disease meeting, Cold Spring Harbor, NY. "Ganglionic GFAP+ glia regulate cardiovascular function via Gq-GPCR activation"
- 2016/03 American Society of Neurochemistry Meeting, Denver, CO. "Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo"
- 2018/05 American Urological Association Meeting, San Francisco. "VEGF-induced bladder nerve remodeling and visceral hyperalgesia in bladder pain"
- 2021/09 American Urological Association Meeting, Virtual. "Sensory glial Gq-GPCR signaling alleviates visceral pain and improves micturition function in an animal model of urological chronic pelvic pain syndrome"
- 2023/05 American Urological Association Meeting, Chicago, IL . "Manipulating peripheral glial signaling to treat pelvic pain"
- 2024/04 American Physiological Society Summit, Long Beach, CA. "Satellite glial regulation of bladder function and pain"
- 2024/04 American Society of Neurochemistry Meeting, Portland, OR. "The analgesic role of satellite glial signaling in bladder sensory ganglia and chronic pelvic pain"

12. Teaching and Mentoring Record

Courses and lectures

University of Science and Technology of China

2004 Teaching Assistant, Zoology Experiments

University of California, Riverside

2008-2009 Teaching Assistant, Introduction to Cell and Molecular Biology Lab

2010 Teaching Assistant, Genetics

2010 Teaching Assistant, Introduction to Neuroscience

2009-2011 Instructor, Neuroscience Laboratory

2010-2011 Teaching Assistant, Cellular Neuroscience: Membrane and Synaptic Phenomena

2009, 2011 Instructor, Human Reproduction and Sexual Behavior

Teaching certificate

University of California, Riverside

2011 University Teaching Certificate
University Teaching Program, the Graduate Division, University of
California, Riverside

Supervision of students and postdoctoral fellows

University of North Carolina at Chapel Hill

2013 **Shailja Admin**, Undergraduate Student, Department of Biology.

Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Shailja Admin's research project during her Individual Mentored Undergraduate Research (Course Credit) for one semester.

2013/06-07 **Jakovin J. Lee**, Undergraduate Student, Department of Biology.
Carolina Summer Fellowship Program

The Carolina Summer Fellowship (CSF) Program is a summer research program for undergraduate students sponsored by the Department of Pharmacology at UNC-Chapel Hill and supported in part by a SURF award from the American Society for Pharmacology and Experimental Therapeutics (ASPET). The CSF Program is designed to give students planning a career in the biomedical sciences an opportunity to conduct research under the direction of a research pharmacologist and to gain knowledge and skills in scientific communication and networking.

Jakovin Lee was selected to participate in this program during summer 2013 in Dr. Ken McCarthy's laboratory in the Department of Pharmacology. As a postdoctoral fellow in Dr. Ken McCarthy's laboratory, Dr. Xie served as the primary mentor and provided laboratory training and project management for Jakovin Lee's research project.

2013-2014 **Jakovin J. Lee**, Undergraduate Student, Department of Biology.

After a successful summer research project, Jakovin Lee continued to conduct research activity in the laboratory of Dr. Ken McCarthy's. During the Fall semester of 2013 and Spring semester of 2014, Dr. Xie

served as the postdoctoral mentor and provided laboratory training and project management for Jakovin Lee's Individual Mentored Undergraduate Research (Course Credit) project.

2014-2016 **Jakovin J. Lee**, B.S., Professional Research Assistant. Department of Pharmacology.

After graduating from UNC Chapel Hill with a Bachelor of Science, Jakovin Lee worked as a Professional Research Assistant in Dr. Ken McCarthy's laboratory. Dr. Xie served as co-mentor. Jakovin Lee was accepted by the University of South Carolina Medical School in 2016. This mentorship resulted in multiple co-authorships including one (1) manuscript and eleven (11) meeting abstracts.

2014 **Brook Teffera**, Undergraduate Student, Department of Biology.

Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Brook Teffera's research project during his Individual Mentored Undergraduate Research (Course Credit) for one semester.

2014 **Miles Herr**, Undergraduate Student, Department of Biology, Department of Music, and Department of Computer science.

Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Miles Herr's Individual Mentored Undergraduate Research (Course Credit) project for two semesters.

2015/06-07 **David Reich**, Undergraduate Student, Department of Biochemistry and Molecular Biology, Brown University.
Carolina Summer Fellowship Program

David Reich was selected to participate in the Carolina Summer Fellowship Program during summer 2015 in Dr. Ken McCarthy's laboratory in the Department of Pharmacology. As a postdoctoral fellow in Dr. Ken McCarthy's laboratory, Dr. Xie served as the primary mentor and provided laboratory training and project management for David Reich's research project.

2015 **Stephanie K. Yu**, Undergraduate Student, Department of Computer science, Department of Biology, and Department of Physics.

Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Staphanie Yu's Individual

Mentored Undergraduate Research (Course Credit) project for two semesters.

- 2016 **Esther Y. Lee**, Undergraduate Student, Department of Biology.
- Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Esther Lee's Individual Mentored Undergraduate Research (Course Credit) project for two semesters.
- 2016 **Dante N. Duncan**, Undergraduate Student, Department of Chemistry.
- Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Dante Duncan's Individual Mentored Undergraduate Research (Course Credit) project for two semesters.
- 2016 **Tanya Qureshi**, Undergraduate Student, Department of Biology.
- Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Tanya Qureshi's Individual Mentored Undergraduate Research (Course Credit) project for one semester.
- 2016 **Angelo Chaia**, Undergraduate Student, Department of Chemistry.
- Dr. Xie served as the postdoctoral mentor and provided laboratory training and project management for Dante Duncan's Individual Mentored Undergraduate Research (Course Credit) project for one semester. This project resulted in a co-authored manuscript.

University of Colorado, Anschutz Medical Campus

- 2018-2019 **Kelly P. Smith**, B.S., Master Student, Department of Bioengineering, College of Engineering, Design and Computing.
- Dr. Xie served as a co-mentor and provided laboratory training for Kelly Smith's research project during his internship in the Urology Research program for two semesters.
- 2022- **Sathish Kumar Yesupatham**, Ph.D., Postdoctoral Research Associate, Department of Surgery, School of Medicine
- Dr. Yesupatham joined Dr. Xie's laboratory in April 2022 as a full-time Postdoctoral Research Associate in the Division of Urology, Department of Surgery. Dr. Xie serves as Dr. Yesupatham's mentor and

provides laboratory training and project management for Dr. Yesupatham's research activity supported by R01 NIH DK129260 (Xie). One manuscript from Dr. Yesupatham has been submitted and two more manuscripts are in active preparation.

2022-2023 **Jin Cha**, B.S., Professional Research Assistant, Department of Surgery, School of Medicine

Jin Cha was hired as a full-time Professional Research Assistant in June 2022. Dr. Xie provided laboratory training and project management for Jin Cha's research activity supported by R01 NIH DK129260 (Xie).

2022-2023 **Kayla Janevski**, B.S., PA-II.
Women in STEM (WiSTEM) Mentorship Program

The goals of the Women in STEM Mentorship Program are to: 1) Facilitate one-on-one mentoring relationships between senior and junior members of the Anschutz campus (and beyond); 2) Create a mentorship community; and 3) Provide training on mentoring skills to mentors and mentees. Participants are matched in a mentor-mentee pair and are required to meet at least once a month. The WiSTEM Mentorship Program also hosts quarterly mentoring mixers and semi-annual training events for mentors and mentees.

Dr. Xie served as the mentor for Kayla Janevski from Sept. 2022 to June 2023. Dr. Xie was nominated for the **Outstanding Mentorship Award** for her mentorship.

2022-2023 **Ester Oh**, Ph.D., Postdoctoral Fellow, Division of Renal Diseases and Hypertension
Women in STEM (WiSTEM) Mentorship Program

Dr. Xie served as the mentor for Ester Oh from Sept. 2022 to June 2023.

2023-2024 **Aubrianna Gholar**, B.A., Master student, Master of Science in Modern Human Anatomy (MHA) Program
Women in STEM (WiSTEM) Mentorship Program

Dr. Xie served as the mentor for Aubrianna Gholar from Sept. 2023 to June 2024.

- 2023-2024 **Aurélie Ledreux**, Ph.D., Associate Professor, Department of Neurosurgery, School of Medicine
Women in STEM (WiSTEM) Mentorship Program
- Dr. Xie served as the mentor for Dr. Aurélie Ledreux from Sept. 2023 to June 2024.
- 2024/06-07 **Alyssa Granley**, Undergraduate Student, Department of Molecular, Cellular, and Developmental Biology, University of Colorado Boulder.
Colorado Research Experiences (CORE) program
- CORE at CU Anschutz provides full-time summer research internships for undergraduate students in research labs at the CU Anschutz Medical Campus. Students receive ongoing mentorship to help them build a career in science or medicine.
- Alyssa Granley was selected to participate in the CORE program in summer 2024 and served as a full-time Undergraduate Research Assistant in Dr. Xie's laboratory. Dr. Xie served as Alyssa Granley's mentor and provided laboratory training and project management for Alyssa Granley's research project.
- 2024/09- **Alyssa Granley**, Undergraduate Student Employee, Department of Surgery, School of Medicine
- After a successful summer internship, Alyssa Granley was hired as a part-time Student Employee in Dr. Xie's laboratory. Dr. Xie continues to provide mentorship, laboratory training, and project management for Alyssa Granley's research project supported by R01 NIH DK129260 (Xie).
- 2024/09- **Emmett Spreitzer**, Undergraduate Student Employee, Department of Surgery, School of Medicine
- Emmett Spreitzer is a junior in the Department of Neuroscience, CU Boulder. Emmett was hired as a part-time Student Employee in Dr. Xie's laboratory. Dr. Xie will provide research mentorship and laboratory training for Emmett Spreitzer's research project supported by the Translational Methods Pilot Award (Xie).
- 2024-2025 **Emma Shelby**, B.S., MD Program, Class of 2027
Women in STEM (WiSTEM) Mentorship Program

2024-2025 **Isabella Tyler, B.S.**, 1st year Graduate Student, Neuroscience
Graduate Program
Women in STEM (WiSTEM) Mentorship Program

Thesis Committee

University of Colorado, Anschutz Medical Campus

2024 **Garcia Gonzalez, Paola**
Toxicology PhD student, the Skaggs School of Pharmacy
Thesis mentor: Manisha Patel, Ph.D. Associate Dean for Research
and Graduate Studies, Professor of CU School of Pharmacy

2024 **Lowe, Samantha**
Biomedical Engineering Master student, University of Colorado -
Boulder
Thesis mentor: Sarah Calve, Ph.D. Associate Professor of Mechanical
Engineering, Materials Science and Biomedical Engineering University
of Colorado Boulder University of Colorado - Boulder

Mentorship awards and nominations

2014 Excellence in Mentoring Undergraduates
Office for Postdoctoral Affairs, University of North Carolina at Chapel
Hill

2023 Outstanding Mentorship Award (nomination)
Women in STEM (WiSTEM) Mentorship Program, University of
Colorado, Anschutz Medical Campus

13. Research Grants

Ongoing research funding

1. NIH/NIDDK R01 DK129260
“Activating Peripheral Glia to Relieve Visceral Pain in Animal Models of Urological
Chronic Pelvic Pain Syndrome (UCPPS)”
Role: Principal Investigator
08/05/2021-05/31/2026
Total direct cost: \$1,100,000
- This project is the first study on the roles of sensory GFAP+ glia in bladder
function and disease.
2. Translational Methods Pilot Award, Colorado Clinical and Translational Sciences
Institute (CCTSI)

“Development of a murine pelvic ganglia-bladder preparation for the study of glial control of micturition”

Role: co-Principal Investigator

08/01/2024-07/31/2025

Total direct cost: \$30,000

- This project aims to establish an MPG-bladder model that can be easily applied to existing LUTS mouse models for mechanistic studies and future hypothesis testing.

Completed research funding (Principal Investigator)

3. Colorado Pilot Program Mentored Award, Colorado Clinical and Translational Sciences Institute

“Beyond the neurons: the role of peripheral glia in neurogenic bladder dysfunction”

Role: Principal Investigator

03/01/2019-02/29/2020

Total direct cost: \$30,000

- This project supported our investigation on how satellite glial Gq-GPCR activation modulates visceral afferent sensitivity in vivo. Pharmacogenetic method was used to remotely activate satellite glial Gq-GPCR signaling in awake mice. This project also included investigations of changes in glial transcriptome and translome in sensory glia innervating the lower urinary tract.

4. Academic Enrichment Fund, Department of Surgery, School of Medicine

“The role of mechanosensitive TREK-1 channels in detrusor overactivity and voiding dysfunction in patients with overactive bladder (OAB)”

Role: Principal Investigator

09/01/2020-08/30/2021

Total direct cost: \$40,000

- This project investigated the cellular and molecular mechanisms of aberrant mechano-sensitivity in idiopathic detrusor overactivity and identify molecular targets and signaling pathways associated with increased sensory activity in overactive LUTS.

5. Ludeman Center Early Career Faculty Research Development Awards

“Sex differences in sympathetic glial regulation of blood pressure”

Role: Principal Investigator

09/01/2023-10/31/2024

Total direct cost: \$25,000

- This project studies the sexual dimorphism in sympathetic glial regulation of blood pressure.

Completed research funding (Key Personnel)

University of North Carolina at Chapel Hill

6. NIH/NINDS R21 NS081589 (McCarthy)

Role: Key Personnel

9/01/2012 – 8/31/2014

Total direct cost: \$270,000

- This project identified the cellular mechanism of glial modulation of cardiovascular functions.

7. NIH/MH RO1 MH099564 (McCarthy)

“Function of Astrocytic GPCR Signaling Cascades in Physiology and Mental Illness“

Role: Key Personnel

6/01/2013 – 5/31/2017

Total direct cost: \$1,368,000

- The proposal for this project was submitted in response to a Request for Applications entitled New Tools for Examining Astrocyte Heterogeneity. The goal was to develop new mouse models expressing engineered GPCRs driven by intersectional gene activation.

University of Colorado, Anschutz Medical Campus

8. NIH/NIDDK R01 DK121506 (Malykhina)

“Regulation of pelvic pain and micturition reflex by VEGF in urological chronic pelvic pain syndrome”

Role: Key Personnel

08/01/2019-07/30/2022

Total direct cost: \$600,000

- This work evaluated the role of bladder VEGF signaling pathways in neurogenesis and neural plasticity of the neural pathways innervating the lower urinary tract.

9. NIH/NIDDK R01 DK116648 (Malykhina)

“Mechanisms of neurogenic voiding dysfunction in a viral murine model of multiple sclerosis”

Role: Key Personnel

09/08/2020-8/30/2023

Total direct cost: \$600,000

- The project investigated the neural mechanisms of lower urinary tract symptoms in an animal model of multiple sclerosis induced by mouse hepatitis virus (MPV).

14. Bibliography

Thesis

- 2022 Bachelor of Science, Biophysics
“Effects of different stimulation modes on short-term synaptic plasticity of visual cortex in adult rats”
- 2005 Master of Science, Neurobiology and Biophysics
“The function of visual cortex neurons of different age rats”
- 2011 Doctor of Philosophy, Neuroscience
“Bidirectional scaling of astrocytic metabotropic glutamate receptor signaling following long-term changes in neuronal synaptic transmission”

Peer-reviewed publications

Graduate/Undergraduate Research

- 2004 Jia F, **Xie X**, Zhou Y. “Short-term depression of synaptic transmission from rat lateral geniculate nucleus to primary visual cortex in vivo”. Brain Research. doi: 10.1016/j.brainres.2004.01.001
- 2005 **Xie X**, Wang H, Chen B, Zhou Y. “Neural response characteristic of neuron to flashing stimulus in visual cortex of young rats”. Progress in Biochemistry and Biophysics. 2005,32(11):1088-1092
- 2005 Jia F, Wei H, Li X, **Xie X**, Zhou Y. “Short-term synaptic plasticity in the rat geniculo-cortical pathway during development in vivo”. Neuroscience Letters. doi: 10.1016/j.neulet.2005.12.054
- 2006 Wang H, **Xie X**, Li X, Chen B, Zhou Y. “Functional degradation of visual cortical cells in aged rats”. Brain Research. doi: 10.1016/j.brainres.2006.09.010
- 2009 Carson MJ, Crane J, **Xie AX**. “Modeling CNS microglia: the quest to identify predictive models”. Drug Discovery Today: Disease Models. Doi: 10.1016/j.ddmod.2008.07.006
- 2012 **Xie AX**, Sun MY, Murphy T, Lauderdale K, Tiglao E, Fiacco TA. “Bidirectional scaling of astrocytic metabotropic glutamate receptor signaling following long-term changes in neuronal firing rates”. PLoS One. doi: 10.1371/journal.pone.0049637

- 2013 Sun MY, Devaraju P, **Xie AX**, Holman I, Samones E, Murphy TR, Fiacco TA. "Astrocyte calcium microdomains are inhibited by bafilomycin A1 and cannot be replicated by low-level Schaffer collateral stimulation in situ". *Cell Calcium*. doi: 10.1016/j.ceca.2013.10.004
- 2014 **Xie AX**, Lauderdale K, Murphy T, Myers TL, Fiacco TA. "Inducing plasticity of astrocytic receptors by manipulation of neuronal firing rates". *Journal of Visualized Experiments*. doi: 10.3791/51458

Postdoctoral Research

- 2013 Agulhon C, Boyt KM, **Xie AX**, Friocourt F, Roth BL, McCarthy KD. "Modulation of the autonomic nervous system and behaviour by acute glial cell Gq protein-coupled receptor activation in vivo". *Journal of Physiology*. doi: 10.1113/jphysiol.2013.261289
- 2015 **Xie AX**, Petravicz, J, McCarthy KD. "Molecular approaches for manipulating astrocytic signaling in vivo". *Frontier in Cellular Neuroscience*. doi: 10.3389/fncel.2015.00144
- 2016 Annis RP, Swahari V, Nakamura A, **Xie AX**, Hammond SM, Deshmukh M. "Mature Neurons Dynamically Restrict Apoptosis via Redundant Pre-Mitochondrial Brakes". *the FEBS Journal*. doi: 10.1111/febs.13944
- 2017 **Xie AX***, Lee JJ, McCarthy KD. "Ganglionic GFAP+ Glial Gq-GPCR Signaling Enhances Heart Functions in vivo". ***Corresponding author**. *Journal of Clinical Investigation Insight*. 2017;2(2):e90565. doi: 10.1172/jci.insight.90565.
- 2017 **Xie AX***, Chaia A, McCarthy KD. "Targeting sympathetic glia for treating cardiovascular diseases". ***Corresponding author**. *Receptors and Clinical Investigation*. 2017;4:e1572. doi: 10.14800/rci.1572.

PI-led and Collaborative Research

- 2019 **Xie AX†**, Pan XQ†, Meacham RB, Malykhina AP. "The Expression of Transcription Factors Mecp2 and CREB Is Modulated in Inflammatory Pelvic Pain", *Frontiers in Systems Neuroscience*. †Equal contribution. doi: 10.3389/fnsys.2018.00069.
- 2020 **Xie AX***, Madayag A, Minton SK, McCarthy KD, Malykhina AP. "Sensory Satellite Glial Gq-GPCR Activation Alleviates Inflammatory Pain via Peripheral Adenosine 1 Receptor Activation". ***Corresponding**

author. Scientific Reports. Sci Rep. 2020 Aug 25;10(1):14181. doi: 10.1038/s41598-020-71073-z

- 2021 **Xie AX†***, Taves S†, McCarthy KD. “Nuclear factor Kappa B-COX2 pathway activation in non-myelinating Schwann cells is necessary for the maintenance of neuropathic pain in mice”. ***Corresponding author.** †Equal contribution. Frontiers in Cellular Neuroscience. doi: 10.3389/fncel.2021.782275
- 2021 Iguchi N, Carrasco A Jr, **Xie AX**, Pineda RH, Malykhina AP, Wilcox DT. (2021) Functional constipation induces bladder overactivity associated with upregulations of Htr2 and Trpv2 pathways. Scientific Reports. doi: 10.1038/s41598-020-80794-0.
- 2022 Clarkson TC, Iguchi N, **Xie AX**, Malykhina AP. Differential transcriptomic changes in the central nervous system and urinary bladders of mice infected with a coronavirus. PLoS ONE. doi: 10.1371/journal.pone.0278918
- 2022 **Xie AX**, Iguchi N, Clarkson TC, Malykhina AP. “Pharmacogenetic inhibition of lumbosacral sensory neurons alleviates visceral hypersensitivity in a mouse model of chronic pelvic pain”. PLoS ONE. doi: 10.1371/journal.pone.0262769
- 2024 **Xie AX†**, Iguchi N†, Malykhina AP*. “Long-term follow-up of TREK-1 KO mice reveals the development of bladder hypertrophy and impaired bladder smooth muscle contractility with age”. American Journal of Physiology, Renal Physiology. †Equal contribution. doi: 10.1152/ajprenal.00382.2023.
- 2024 Yesupatham SK, Malykhina AP, **Xie AX***. “Transcriptome Analysis in Lumbosacral Dorsal Root Ganglia Reveals Molecular Changes in Animal Models of Urological Chronic Pelvic Pain Syndrome (UCPPS)”. ***Corresponding author.** Scientific Report, Submitted.

Competitive abstracts

- 2016 **Xie AX**, McCarthy KD. “Chemogenetic Activation of Satellite Glial Gq-GPCR Signaling Regulates Cardiovascular Functions in vivo”. Arteriosclerosis, Thrombosis and Vascular Biology and Peripheral Vascular Disease (ATVB/PVD) Meeting, May 5 - 7, 2016. Nashville, TN. Moderated Poster Presentation

- 2018 **Xie AX**, Nedumaran B, Meacham RB, Malykhina AP. “Vascular Endothelial Growth Factor (VEGF) induces bladder nerve remodeling and visceral hyperalgesia in mouse model of bladder pain”. American Urological Association Meeting, May 17 - 21, San Francisco, CA. Oral Presentation
- 2018 **Xie AX**, Meacham R, Malykhina AP. “VEGF-induced bladder nerve remodeling and visceral hyperalgesia in bladder pain”. South Central Section of the American Urological Association Meeting, September 26 – 29, 2018. Nashville, TN. Moderated Poster Presentation
- 2019 **Xie AX**, Meacham RB, Malykhina AP. “Pharmacogenetic inhibition of afferent excitability alleviates VEGF-induced visceral allodynia and hyperalgesia in a mouse model of urological chronic pelvic pain syndrome (UCPPS)”. South Central Section of the American Urological Association Meeting, September 25 - 28, 2019. Colorado Springs, CO. Moderated Poster Presentation
- 2019 **Xie AX**, Meacham RB, Malykhina AP. “Pharmacogenetic inhibition of afferent excitability alleviates VEGF-induced visceral allodynia and hyperalgesia in a mouse model of UCPPS”. Society for Basic Urologic Research meeting, November 7–10, 2019. New Orleans, LA. Poster Presentation
- 2020 **Xie AX**, Meacham RB, Malykhina AP. “Pharmacogenetic inhibition of lumbosacral spinal and sensory neurons alleviates visceral pain and improves lower urinary tract symptoms in animal model of urological chronic pelvic pain syndrome”. American Urological Association Meeting (cancelled due to COVID-19). Accepted for Moderated Poster Presentation
- 2020 **Xie AX**, Meacham RB, Malykhina AP. “Lumbar-sacral neuromodulation alleviates visceral pain and improves lower urinary tract symptoms in animal model of urological chronic pelvic pain syndrome”. South Central Section of the American Urological Association Meeting, October 10, 2020. Virtual. Oral Presentation
- 2020 **Xie AX**, Meacham RB, Malykhina AP. “Adeno-associated viral vector (AAV)-mediated pharmacogenetic inhibition of lumbosacral sensory neurons alleviates visceral hypersensitivity in a mouse model of urological chronic pelvic pain syndrome (UCPPS)”. Society for Basic Urologic Research meeting, Virtual. Poster Presentation

- 2021 **Xie AX**, Meacham RB, Malykhina AP. “Sensory glial Gq-GPCR signaling alleviates visceral pain and improves micturition function in an animal model of urological chronic pelvic pain syndrome”. American Urological Association Meeting, September 10 – 13, 2021. Virtual. Oral Presentation
- 2022 **Xie AX**, Meacham RB, Malykhina AP. “Modulation of Sensory Glia Gq-GPCR Signaling in vivo Affects Spontaneous Voiding and Bladder Function in an Animal Model of Chronic Pelvic Pain”. American Urological Association Meeting, May 13 – 16, 2022. New Orleans, LA. Moderated Poster Presentation
This poster presentation was awarded the "**2022 AUA Best Poster**".
- 2022 **Xie AX**, Meacham RB, Malykhina AP. “Modulation of Sensory Glia Gq-GPCR Signaling in vivo Affects Spontaneous Voiding and Bladder Function in an Animal Model of Chronic Pelvic Pain”. South Central Section of the American Urological Association Meeting, September 7 - 10, 2022. Coronado, CA. Oral Presentation
- 2023 **Xie AX**. “Manipulating peripheral glial signaling to treat pelvic pain”. American Urological Association Meeting, April 28 – May 1, 2023. Chicago, IL. Oral Presentation
- 2023 **Xie AX**, Iguchi N, Malykhina AP. “The Lack of Mechanosensitive TREK-1 Channel Mimics the Development of Aging-related Bladder Phenotypes in Mice”. American Urological Association Meeting, April 28 – May 1, 2023. Chicago, IL. Moderated Poster Presentation
- 2023 Yesupatham SK, **Xie AX**. “Transcriptome Analysis in Lumbosacral Dorsal Root Ganglia Reveals Key Molecular Changes in Animal Models of Urological Chronic Pelvic Pain Syndrome (UCPPS)”. American Urological Association Meeting, April 28 – May 1, 2023. Chicago, IL. Moderated Poster Presentation
- 2023 Yesupatham SK, **Xie AX**. “Transcriptome Analysis in Lumbosacral Dorsal Root Ganglia Reveals Key Molecular Changes in Animal Models of Urological Chronic Pelvic Pain Syndrome (UCPPS)”. South Central Section of the American Urological Association Meeting, September 6 - 9, 2023. Austin, TX. Moderated Poster Presentation
- 2024 Yesupatham SK, **Xie AX**. “Targeted Purification of Polysomal mRNA Sequencing reveals satellite glial cells-specific translational changes during in animal models of urological chronic pelvic pain syndrome”.

American Urological Association Meeting, May 3 – May 6, 2024. San Antonio, TX. [Moderated Poster Presentation](#)

- 2024 Yesupatham SK, **Xie AX**. “Targeted Purification of Polysomal mRNA Sequencing reveals satellite glial cells-specific translational changes during in animal models of urological chronic pelvic pain syndrome”. South Central Section of the American Urological Association Meeting, October 30 - November 2, 2024. Colorado Springs, CO. [Moderated Poster Presentation](#)
- 2024 **Xie AX**, Yesupatham SK. “A new approach to neuromodulation: how to use pharmacogenetic activation in non-neuronal cells to promote micturition and alleviate visceral pain”. South Central Section of the American Urological Association Meeting, October 30 - November 2, 2024. Colorado Springs, CO. [Moderated Poster Presentation](#)
- 2024 Yesupatham SK, **Xie, AX**. “Sex-specific sympathetic satellite glial regulation of resting blood pressure”. National Conference on Women's Health and Sex Differences Research - Sex Differences Across the Lifespan: Focusing on Cardiometabolism and Mental Health. October 23 - 25, 2024. Colorado Springs, CO.

Non-competitive abstracts

- 2007 **Xie X**, Carson M. “Microglial activation in the cuprizone model of adult demyelination and remyelination”. Society for Neuroscience Meeting, November 3 - 7, 2007. San Diego, CA. [Poster Presentation](#)
- 2008 **Xie X**, Carson M. “TLT2 has both constitutive and inducible patterns of expression in the healthy and inflamed CNS”. American Society for Neurochemistry meeting, March 1 - 5, 2008. San Antonio, Texas. [Poster Presentation](#)
- 2008 **Xie X**, Carson M. “TLT2 has both constitutive and inducible patterns of expression in the healthy and inflamed CNS”. La Jolla Immunology Conference, October 21 - 23, 2008. La Jolla, CA. [Poster Presentation](#)
- 2009 **Xie X**, Fiacco TA. “Homeostatic scaling of astrocyte glutamate receptors and transporters”. Gordon Conference, Glial Biology: Functional Interactions among Glia & Neurons, March 15 - 20, 2009. Ventura, California. [Poster Presentation](#)

- 2009 **Xie AX**, Fiacco TA. “Homeostatic scaling of astrocyte glutamate receptors and transporters”. Society for Neuroscience Meeting, October 17 – 21, 2009. Chicago, IL. [Poster Presentation](#)
- 2010 **Xie AX**, Fiacco TA. “Homeostatic scaling of astrocyte glutamate receptors and transporters”. Society for Neuroscience Meeting, November 13 – 17, 2010. San Diego, CA. [Poster Presentation](#)
- 2011 **Xie AX**, Fiacco TA. “Homeostatic plasticity of astrocytic metabotropic glutamate receptors”. Gordon Conference, Glial Biology: Functional Interactions among Glia & Neurons, March 6-11, 2011. Ventura, California. [Poster Presentation](#)
- 2011 **Xie AX**, Fiacco TA. “Bidirectional scaling of astrocytic metabotropic glutamate receptor signaling following long term changes in neuronal synaptic transmission”. Society for Neuroscience Meeting, November 12 – 16, 2011. Washington, DC. [Poster Presentation](#)
- 2013 **Xie AX**, Boyt K, Agulhon C, McCarthy KD. "Studying the Role of Glial Gq Signaling in the Regulation of the Cardiovascular System". Gordon Conference, Glial Biology: Functional Interactions among Glia & Neurons, March 3 - 8, 2013. Ventura, California. [Poster Presentation](#)
- 2013 **Xie AX**, Boyt K, Agulhon C, McCarthy KD. "Studying the Role of Glial Gq Signaling in the Regulation of the Cardiovascular System". Department of Pharmacology Retreat, University of North Carolina at Chapel Hill. March 26, 2013. Chapel Hill, NC. [Poster Presentation](#)
- 2013 **Xie AX**, McCarthy KD. “Elimination of neuronal driven Ca²⁺ Activity in astrocytes in IP3R2 knock-out (IP3R2 KO) mice”. Society for Neuroscience Meeting, November 9 – 13, 2013. San Diego, CA. [Poster Presentation](#)
- 2014 **Xie AX**, Lee JJ, McCarthy KD. “Ganglionic glia regulate cardiovascular function via Gq-GPCR activation”. UNC’s Integrative Vascular Biology (IVB) T32 Training Program and the McAllister Heart Institute (MHI) joint Research Symposium, March 11, 2014. Chapel Hill, NC. [Poster Presentation](#)
- 2014 **Xie AX**, Lee JJ, McCarthy KD. “Chemogenetic activation of GFAP⁺ glia localizes a new regulatory unit of sympathetic output”. Cold Spring Harbor Laboratory Glia in Health & Disease meeting, July 17 – 21, 2014. Cold Spring Harbor, NY. [Oral Presentation](#)

- 2015 **Xie AX**, Lee JJ, McCarthy KD. “Ganglionic GFAP+ glia regulate cardiovascular function”. Gordon-Kenan Research Seminar and Gordon Conference, Glial Biology: Functional Interactions among Glia & Neurons, February 28 - March 1, 2015. Ventura, CA. [Poster Presentation](#)
- 2015 **Xie AX**, Lee JJ, McCarthy KD. “Ganglionic GFAP+ glia regulate cardiovascular function”. Glial Biology Across Taxonomy – Implications for Function & Dysfunction symposium at Duke, March 25, 2015. Durham, NC. [Poster Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo”. American Society of Neurochemistry Meeting, March 19 - 23, 2016. Denver, CO. [Oral Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Chemogenetic Activation of Satellite Glial Gq-GPCR Signaling Regulate Cardiovascular Functions in vivo”. American Society of Neurochemistry Meeting, March 19 - 23, 2016. Denver, CO. [Poster Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Chemogenetic Activation of Satellite Glial Gq-GPCR Signaling Regulate Cardiovascular Functions in vivo”. UNC’s Integrative Vascular Biology (IVB) T32 Training Program and the McAllister Heart Institute (MHI) joint Research Symposium, March 8, 2016. Chapel Hill, NC. [Poster Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo”. Department of Pharmacology Retreat, University of North Carolina at Chapel Hill, April 1, 2016. Chapel Hill, NC. [Oral Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Gq-GPCR Signaling in Sympathetic Satellite Glial Cells Regulate Cardiovascular Functions in vivo”. Duke Neuroimmunology and Glia Group Annual Retreat, April 11, 2016. Durham, NC. [Oral Presentation](#)
- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Sympathetic ganglionic GFAP+ Glia Regulate Cardiovascular Functions in vivo”. Weinstein Cardiovascular Development and Regeneration Conference, May 19 – 21, 2016. Durham, NC. [Poster Presentation](#)

- 2016 **Xie AX**, Lee JJ, McCarthy KD. “Chemogenetic activation of satellite glial Gq-GPCR signaling enhances cardiovascular function in vivo”. International Conference on Glial Biology in Medicine, October 16 – 18, 2016. Roanoke, VA. [Poster Presentation](#)
- 2018 **Xie AX**, Taves S, Madayag A, McCarthy KD, Malykhina AP. “Targeting Satellite Glial Signaling for the Treatment of Chronic Pain”. American Society of Neurochemistry Meeting, March 24 - 28, 2018. Riverside, CA. [Poster Presentation](#)
- 2018 **Xie AX**, Taves S, Madayag A, McCarthy KD, Malykhina AP. “Targeting Satellite Glial Signaling for the Treatment of Chronic Pain”. Rocky Mountain Regional Neuroscience Group Annual Meeting, May 11, 2018. Aurora, CO. [Poster Presentation](#)
- 2021 **Xie AX**, Malykhina AP. “Pharmacogenetic inhibition of afferent excitability alleviates VEGF-induced visceral hypersensitivity in a mouse model of UCPPS”. American Society of Neurochemistry Meeting, June 28 - July 1, 2021. Virtual. [Poster Presentation](#)
- 2023 Yesupatham SK, **Xie AX**. “Transcriptome Analysis in Lumbosacral Dorsal Root Ganglia Reveals Key Molecular Changes Underlying Nociceptive Sensitization in Animal Models of Urological Chronic Pelvic Pain Syndrome”. ASN annual meeting, American Society of Neurochemistry Meeting, March 18 - 22, 2023. Lexington, KY. [Poster Presentation](#)
- 2024 **Xie AX**. " Satellite Glial Regulation of Autonomic Function". American Physiological Society Summit, April 4 – 7, 2024. Long Beach, CA. [Oral Presentation](#)
- 2024 **Xie AX**. “The analgesic role of satellite glial signaling in bladder sensory ganglia and chronic pelvic pain”. American Society of Neurochemistry Meeting, April 14 - 18, 2024. Portland, OR. [Oral Presentation](#)
- 2024 Yesupatham SK, **Xie, AX**. “Targeted Purification of Polysomal mRNA Sequencing reveals satellite glial cells-specific translational changes during in animal models of urological chronic pelvic pain syndrome”. American Society of Neurochemistry Meeting, April 14 - 18, 2024. Portland, OR. [Poster Presentation](#)
- 2024 Granley A, Yesupatham SK, **Xie, AX**. “TRAP and glia: Revealing Translational Change in Sensory Glia during the Pathogenesis of

Visceral Pain” Undergraduate Summer Research Symposium, July 26, 2024. Aurora, CO. [Poster Presentation](#)

- 2024 Granley A, Yesupatham SK, **Xie, AX**. “Revealing Translatome Changes in Sensory Glia using Translating Ribosome Affinity Purification & RNA Sequencing” Neuroscience Graduate Program Retreat, October 24 - 26, 2024. Esters Park, CO. [Poster Presentation](#)

15. Citations and Highlights of Work in Media

- 2017 UNC School of Medicine, News. “Ganglionic GFAP+ glial Gq-GPCR signaling enhances heart functions in vivo”.
<https://www.med.unc.edu/pharm/ganglionic-gfap-glial-gq-gpcr-signaling-enhances-heart-functions-in-vivo/>
- 2022 *AUA News*, November issue. “Sensory Glia Gq-GPCR Activation In Vivo Modulates Micturition Functions in an Animal Model of Chronic Pelvic Pain”.
<https://auanews.net/issues/articles/2022/november-2022/aua2022-best-posters-sensory-glia-gq-gpcr-activation-in-vivo-modulates-micturition-functions-in-an-animal-model-of-chronic-pelvic-pain>
- 2023 *AUA Daily News*. “New approaches to understanding and treating pelvic pain”.
<https://www.auadailynews.org/aua-2023/article/22860473/new-approaches-to-understanding-and-treating-pelvic-pain>
- 2023 University of Colorado, Anschutz Medical Campus, Department of Surgery, News. “Studying the Role of Glial Cells in Regulating Blood Pressure”.
<https://news.cuanschutz.edu/department-of-surgery/role-of-glial-cells-in-regulating-blood-pressure>
- 2023 The John Hopkins Newsletter. “Alison Xie describes analgesic effects of glial-neuron interactions”.
<https://www.jhunewsletter.com/article/2023/10/alison-xie-describes-analgesic-effects-of-glial-neuron-interactions>
- 2023 University of Colorado, Anschutz Medical Campus, Department of Surgery, News. “Alison Xie, PhD, Named SBUR Young Investigator for 2023”.
<https://news.cuanschutz.edu/department-of-surgery/alison-xie-phd-named-sbur-young-investigator-for-2023>

- 2024 American Journal of Physiology-Renal Physiology, “First Author Highlights”.
<https://journals.physiology.org/doi/full/10.1152/ajprenal.2024.326.6.AU>
- 2024 University of Colorado, Anschutz Medical Campus, Department of Surgery, News. “CCTSI Grant Funds New Model for Bladder Research”.
<https://news.cuanschutz.edu/department-of-surgery/cctsi-grant-funds-new-model-for-bladder-research>