

LUCOM Medical Student Pre-Clinical Research Elective

Faculty Research & Scholarly Activity Program Overview

Mentor Information

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Expectations for Student Involvement During the Summer Research Elective

Please indicate amount of time students should dedicate to your research program over the summer to generate enough data/information for a research/scholarly activity product (such as an abstract for LUCOM Research Day or other meeting/conference).

More than 4-Weeks

Number of Students Willing/Able to Mentor During the Summer Research Elective

Please indicate the number of students who are able to participate in your research program for the Summer Research Elective.

3

Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

Immunological regulation of the gastrointestinal tract in trauma, sepsis, inflammatory bowel disease, and postoperative ileus.

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

<https://www.abstractsonline.com/pp8/#!/10469/presentation/5662>

- Acute Endothelial Cell Dysfunction Caused by A Protein Extract From Damaged Skeletal Muscle

<https://pubmed.ncbi.nlm.nih.gov/22489868/>

- Role of interleukin-6 in hemopoietic and non-hemopoietic synergy mediating TLR4-triggered late murine ileus and endotoxic shock

<https://pubmed.ncbi.nlm.nih.gov/21303433/>

- Novel model of peripheral tissue trauma-induced inflammation and gastrointestinal dysmotility

<https://pubmed.ncbi.nlm.nih.gov/19359433/>

- Role of interleukin 10 in murine postoperative ileus

<https://www.abstractsonline.com/pp8/#!/10469/presentation/6849>

Elucidation of a Novel Mechanism of Perioperative and Postoperative Ileus: Microvascular Leak of Serum Immunoglobulins Directly Activate Inhibitory Nitroergic Neuromuscular Transmission Causing Ileus

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Mentor Information

Name: Joseph Gigliotti, Ph.D.
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 Office #: 3022
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Expectations for Student Involvement During the Summer Research Elective

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More than 4-Weeks

Number of Students Willing/Able to Mentor During the Summer Research Elective

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6

Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

Diet/Nutrition in animal models of human disease.
 Renal physiology and pathophysiology.

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

Brus et al., (2021). DOI: 10.3390/nu13051521

Hintze et al., (2018). DOI: 10.1093/advances/nym002

Pabla et al., (2021). DOI: 10.5772/intechopen.97523

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LUCOM Medical Student Pre-Clinical Research Elective

Faculty Research & Scholarly Activity Program Overview

Mentor Information

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Expectations for Student Involvement During the Summer Research Elective

Please indicate amount of time students should dedicate to your research program over the summer to generate enough data/information for a research/scholarly activity product (such as an abstract for LUCOM Research Day or other meeting/conference).

More than 4-Weeks

Number of Students Willing/Able to Mentor During the Summer Research Elective

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5-8

Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

Cancer continues to be a major cause of mortality for people all over the world but autologous cancer immunotherapy continues to emerge as an extremely exciting therapeutic strategy. This project aims to define the role of mast cells in cancer and use them for the first time as a novel autologous Trojan horse therapy against tumors expressing HER2/*neu* (breast cancer). The use of *in vivo* xenograft cancer models and “humanized” mice engrafted with human mast cells will ultimately help determine the role of mast cells in cancer pathogenesis and potentially lead to a new approach for treating cancers. In this rotation students will learn basic laboratory immunology skills including tissue culture, ELISA, PCR, stem cell isolation, immunohistochemistry, *in vivo* mouse models of cancer, *in vitro* culture of cell lines, FACS, etc.

Fields of interest include human mast cells and basophils, cancer mechanisms, signal transduction, alpha gal allergy, anaphylaxis, food allergy, mastocytosis, stem cells, nanotechnology, nanomedicine, ocean sustainability, septic shock, making monoclonal antibodies, entrepreneurship, and desensitization.

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

1. Fereydouni M, Motaghed M, Ahani E, Kafri T, Dellinger K, Metcalfe DD and **Kepley CL**, (2022) Human Tumor Targeted Cytotoxic Mast Cells for Cancer Immunotherapy, *Frontiers Oncology* Apr 22;12:871390. doi: 10.3389/fonc.2022.871390
2. Elnaz Ahzini, Mohammad Ferydoini, and **Kepley, CL**, Identification and characterization of tunneling nanotubes involved in human mast cell FcεRI-mediated apoptosis of cancer cells, *Cancers*, 2022 Jun 14;14(12):2944. doi: 10.3390/cancers14122944.
3. Fereydouni M, Motaghed M, Ahani E, Kafri T, Dellinger K, Metcalfe DD and **Kepley CL**, (2022) Harnessing the Anti-Tumor Mediators in Mast Cells as a New Strategy for Adoptive Cell Transfer for Cancer. *Front. Oncol.* 12:830199. doi: 10.3389/fonc.2022.830199
4. Jesse D. Plotkin, Michael Elias, Tracy R. Daniels-Wells, Anthony Dellinger, Manuel L. Penichet, **Kepley, CL**, Human Mast Cells from Adipose Tissue Target and Induce Apoptosis of Breast Cancer Cells, *Frontiers in Immunology*, February 8, 2019.
5. Onyinye Iweala, Mohammad Fereydouni, Mona Motaghed, Camille Kapita, Scott Commins, **Kepley, CL**, Alpha-gal Induced Mediator Release by Human Mast Cells, *J. Allergy Clin. Immunol.* Volume 145, issue 2, February 01, 2020.

LUCOM Medical Student Pre-Clinical Research Elective

Faculty Research & Scholarly Activity Program Overview

Mentor Information

Name: Ying Liu

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Expectations for Student Involvement During the Summer Research Elective

Please indicate amount of time students should dedicate to your research program over the summer to generate enough data/information for a research/scholarly activity product (such as an abstract for LUCOM Research Day or other meeting/conference).

More than 4-Weeks

Number of Students Willing/Able to Mentor During the Summer Research Elective

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2

Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

Endogenous retroviruses in cancer development

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

Ku Y, Park JH, Cho R, Lee Y, Park HM, Kim M, Hur K, Byun SY, Liu J, Lee YS, Shum D, Shin DY, Koh Y, Cho JY, Yoon SS, Hong J, Kim Y. Noncanonical immune response to the inhibition of DNA methylation by Staufen1 via stabilization of endogenous retrovirus RNAs. *Proc Natl Acad Sci U S A*. 2021 Mar 30;118(13):e2016289118. doi: 10.1073/pnas.2016289118. PMID: 33762305; PMCID: PMC8020767.

Chiappinelli KB, Strissel PL, Desrichard A, Li H, Henke C, Akman B, Hein A, Rote NS, Cope LM, Snyder A, Makarov V, Budhu S, Slamon DJ, Wolchok JD, Pardoll DM, Beckmann MW, Zahnow CA, Merghoub T, Chan TA, Baylin SB, Strick R. Inhibiting DNA Methylation Causes an Interferon Response in Cancer via dsRNA Including Endogenous Retroviruses. *Cell*. 2015 Aug 27;162(5):974-86. doi: 10.1016/j.cell.2015.07.011. Erratum in: *Cell*. 2016 Feb 25;164(5):1073. Buhu, Sadna [corrected to Budhu, Sadna]; Mergoub, Taha [corrected to Merghoub, Taha]. Erratum in: *Cell*. 2017 Apr 6;169(2):361. PMID: 26317466; PMCID: PMC4556003.

Nadeau MJ, Manghera M, Douville RN. Inside the Envelope: Endogenous Retrovirus-K Env as a Biomarker and Therapeutic Target. *Front Microbiol.* 2015 Nov 13;6:1244. doi: 10.3389/fmicb.2015.01244. PMID: 26617584; PMCID: PMC4643131.

Nelson PN, Carnegie PR, Martin J, Davari Ejtehad H, Hooley P, Roden D, Rowland-Jones S, Warren P, Astley J, Murray PG. Demystified. Human endogenous retroviruses. *Mol Pathol.* 2003 Feb;56(1):11-8. doi: 10.1136/mp.56.1.11. PMID: 12560456; PMCID: PMC1187282.

Göke J, Lu X, Chan YS, Ng HH, Ly LH, Sachs F, Szczerbinska I. Dynamic transcription of distinct classes of endogenous retroviral elements marks specific populations of early human embryonic cells. *Cell Stem Cell.* 2015 Feb 5;16(2):135-41. doi: 10.1016/j.stem.2015.01.005. PMID: 25658370.

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Mentor Information

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More than 4-Weeks

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Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

Martin, J.R. and McManus, S.P. Evidence that multiple pre- and postsynaptic cannabinoid receptors modify cholinergic neurotransmission in the posterior hypothalamic nucleus of the rat. Program No. 272.2. 2005 *Abstract Viewer and Itinerary Planner*. Washington, DC: Society for Neuroscience, 2005.

Newey, C.R. and **J.R. Martin**. Increase in sensitivity of the baroreceptor reflex following microinjection of carbachol into the posterior hypothalamic nucleus of awake rats. *Autonomic and Autocoid Pharmacology* 36:3-12, 2016.

Martin, J.R. Pressor response to posterior hypothalamic administration of carbachol is mediated by muscarinic M₃ receptor. *European J. Pharmacol.* 215:83-92, 1992.

Martin, J.R., M.M. Knuepfer, and T.C. Westfall. Hemodynamic effects of posterior hypothalamic injection of neuropeptide Y in awake rat. *Am. J. Physiol. (Heart Circ. Physiol. 30)* 261:H814-H824, 1991.

Martin, J.R. The Y₁ receptor subtype mediates the cardiovascular changes evoked by NPY administration into the posterior hypothalamic area of conscious rat. *Brain Res.* 1002:11-20, 2004.

LUCOM Medical Student Pre-Clinical Research Elective
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Mentor Information

Name: Michael S. Price, PhD
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More than 4-Weeks

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3 students

Research & Scholarly Activity Interests and Area(s) of Expertise

Please list the fields in which you study and/or are recognized as an expert.

Microbiology, mycology, molecular biology, genetics, functional genomics, bioinformatics, carbon metabolism

List of Publications/References for Students to Review

Please provide no more than 5 references for student review that are pertinent to your research program.

Berguson HP, Caulfield LW, Price MS. 2022. Influence of Pathogen Carbon Metabolism on Interactions With Host Immunity. *Frontiers in Cellular and Infection Microbiology* 12.

Price MS, Betancourt-Quiroz M, Price JL, Toffaletti DL, Vora H, Hu G, Kronstad JW, Perfect JR. 2011. *Cryptococcus neoformans* Requires a Functional Glycolytic Pathway for Disease but Not Persistence in the Host. *mBio* 2:e00103-11.

Price MS, Nichols CB, Alspaugh JA. 2008. The *Cryptococcus neoformans* Rho-GDP dissociation inhibitor mediates intracellular survival and virulence. *Infection and Immunity* 76:5729-37.

Pianalto KM, Ost KS, Brown HE, Alspaugh JA. 2018. Characterization of additional components of the environmental pH-sensing complex in the pathogenic fungus *Cryptococcus neoformans*. *J Biol Chem* 293:9995-10008.

Brown HE, Ost KS, Esher SK, Pianalto KM, Saelens JW, Guan Z, Andrew Alspaugh J. 2018. Identifying a novel connection between the fungal plasma membrane and pH-sensing. *Mol Microbiol* 109:474-493.

LUCOM Medical Student Pre-Clinical Research Elective
Faculty Research & Scholarly Activity Program Overview

Mentor Information

Name: **R James Swanson**
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Four (4)

Research & Scholarly Activity Interests and Area(s) of Expertise

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Production of mouse embryos; incubating mouse embryos in the presence of potential teratogens; using condensed vapor from a vaping mod for analysis of mouse embryo development with various percent nicotine concentrations and different vapor flavors.

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Please provide no more than 5 references for student review that are pertinent to your research program.

Look up current papers on **Cannabis, nicotine, and flavor Vaping: Related to existing and Emerging Modalities, Chemistry, and Pulmonary Toxicology**; papers like: Serum proteome and high wattage e-cigarette vaping: a randomized crossover study. Journal of Hypertension. (2021)

<https://www.sciencedirect.com/science/article/pii/S0890623812002833#aep-abstract-sec-id12>

<https://www.ncbi.nlm.nih.gov/pubmed/27475060>

Click or tap here to enter text. E-cigarette vaping liquids and the flavoring chemical cinnamaldehyde perturb bone, cartilage and vascular development in zebrafish embryos. Aquatic Toxicology. (2021).

[https://www.europeanurology.com/article/S0302-2838\(16\)30926-5/fulltext#sec0035](https://www.europeanurology.com/article/S0302-2838(16)30926-5/fulltext#sec0035)

