SURVEY OF 2017 SUMMER STUDENT
RESEARCH PROJECTS

PLEASE TYPE OR WRITE LEGIBLY

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Please list below one or two research projects in your lab that would be available for an eight-week scholarship program. Include a one-paragraph discussion of the project including pertinent data that students could use to help evaluate programs that would be of interest to them and the type of work they would be doing. Investigators who request more than one student may be assigned an additional student if, as in the past several years, more students apply to do research than the number of investigators available. It is important, however that the investigator be able to provide adequate and timely supervision and that the project is ready (IRB approval arranged, etc.) before the student is scheduled to begin work on their summer research project.

1. Project title: **The Mechanism of Limb Dorsalization**

Summary paragraph:

Lmx1b is a homeodomain transcription factor that dorsalizes the limb during development and is disrupted in Nail-Patella syndrome. Mutant mice that lack Lmx1b function have symmetrical ventral-ventral distal limb muscles, joints and tendons. However, we do not know how Lmx1b accomplishes dorsalization. We have identified a number of Lmx1b targets using genomic techniques. We are investigating these targets to document their role in dorsalization.

The summer experience includes: learning and using basic microsurgical skills, molecular biology techniques and some of the therapeutic approaches to gene therapy i.e. ectopic gene delivery. We have weekly lab conferences and students are expected to present their work at these conferences and at least two scientific meetings.

2. Project title:

Summary paragraph:

Fibroblast growth factors (Fgfs) promote limb bud outgrowth during development and regeneration. Fgfs are also known to induce the patterning factor, Shh, to shape the emerging limb or the regenerating tissue during outgrowth. however, the mechanism by which Fgf regulates Shh expression is unknown and may be critical in allowing limb regeneration. We have identified a number of molecules that may be necessary intermediates in the Fgf-Shh loop. This summer we will evaluate several candidates and the regulatory activity of the limb-specific Shh regulatory region, a cis-regulatory module nearly a million bases upstream of the Shh coding sequence.

The summer experience includes: learning and using basic microsurgical skills, molecular biology techniques and some of the therapeutic approaches to gene therapy i.e. ectopic gene delivery. We have weekly lab conferences and students are expected to present their work at these conferences and at least two scientific meetings.

Please list complete references for your significant recent publications or, where applicable, publications where students have shared authorship (students in **Bold**). List one, two, or three.

1. Pira CU, **Caltharp SA**, Haro E, Oberg KC. 2017. A Rapid *In Vivo* Bioassay for Developmentally Active Enhancers. JoVE. (In Press)
2. **Gray AL**, Haro E, **Spady CD**, Pira CU, Oberg KC. 2017. Identification of a Novel Silencer within an Lmx1b Mediated Cis-regulatory Module. FASEB J 31: (In Press)
3. **Ivey LA**, Haro E, Pira CU, Oberg KC. 2017. Lmx1b-dependent Activity of an Associated Enhancer Suggests Lmx1b Autoregulation. FASEB J 31: (In Press)
4. **Spady RN**, Haro E, Pira CU, Feenstra JM, Oberg KC. 2016. Lmx1b-Mediated Limb Dorsalization: Identification of a Potential Regulatory Sequence for Keratocan, Lumican, and Decorin. FASEB J 30:1032.5
5. Watson BA, Pira CU, **Real DM, LaBarba DJ**, Oberg KC. 2016. LIM Homeobox 2 (LHX2) is a Downstream Intermediate of FGF in the Induction of SHH Expression in the Developing Limb. FASEB J 30:LB25
6. **Spady CD**, Haro E, **Tegeler L**, Pira CU, Oberg KC**.** 2015. Evidence for Lmx1b Self-Regulation during Limb Dorsalization. (Award Finalist) FASEB J 29:871.4.
7. **Kim EJ**, Haro E, Pira CU, **Tegeler L**, Oberg KC**.** 2015. Lmx1b-mediated Emx2-Associated Regulatory Region Active during Limb Development. FASEB J 29:871.3.

Please indicate your **first** and **second** choice of dates to present your **5-minute summary** to interested students between 12:00 and 1:00 at the luncheon in the Alumni Hall Amphitheater. You will be notified of your presentation time.

X Monday, February 13

X Tuesday, February 14

X Wednesday, February 15

NOTE: Research positions will be made available to medical students first and then, those that remain unfilled will be offered to undergraduate students. Please indicate if you would be willing to supervise a qualified undergraduate student subject to a satisfactory interview by circling the following: **YES** **NO**

Signature  Date **01/18/17**

RETURN THIS FORM TO: **Gaby Kunze**
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DEADLINE DATE: **Friday, January 13, 2017**