

# 2020 PAID SUMMER PROGRAMS INFORMATION MEETING: JANUARY 18, 2020\*

**Analysis of gene expression in sub clones of an osteocytic cell line**  
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**Abstract**  
Osteoclasts, the bone forming cells, and osteoclasts, the bone resorbing cells, are necessary to maintain bone mass in human and mice models. Over the years the only osteocytic cell line that has been completely characterized is the MLO-Y4. However, these cells do not express sclerostin, the product of the SOST gene and a molecule that is essential for osteocyte function. Normally sclerostin decreases bone formation, if there are lower levels of sclerostin then there are higher levels of bone formation. Previous work of Dr. Plotkin's laboratory created sub clones of the MLO-Y4 osteocytic cells expressing green fluorescent protein (GFP). The purpose of my project is to determine the expression of protein and gene expression and, in particular, any of the sub clones expresses SOST/sclerostin. Currently we are working on protein expression to check the levels of SOST/sclerostin. I have started having different subclones, and have analyzed the cellular morphology and the expression of GFP. I have also isolated protein and mRNA from 4 subclones. Once we collect protein and mRNA from at least 4 subclones we will use Western blotting to measure protein expression and the qPCR to measure gene expression.

**Objective**  
The aim is to determine the levels of SOST/sclerostin in the sub clones after being cultured. This is done by determining gene and protein expression.

**Methods**  
**Establishment of MLO-Y4 cells stable transduced with green fluorescent protein:**  
The plasmid containing the neuronal GFP construct was transiently transfected into the packaging cell line Phoenix Eco (3) using Superfect (Qiagen, Santa Clarita, CA).  
Supernatants containing retroviral particles were collected 24-48 h after transfection, and used to infect cell cultures.  
Subconfluent MLO-Y4 osteocytic cells were exposed to viral supernatants in the presence of 8 µg/ml polybrene for 8 h and then incubated in fresh culture medium for 24 h.  
Transduced cells were selected by culturing them in the presence of 400 µg/ml of G418 for three weeks.  
**Experimental Procedure:**  
**Cell culture** - MLO-Y4 GFP-expressing osteocytic cells were cultured and expanded using 10cm collagen coated plates. Cells from expanded clones were trypsinized and plated in replicates of 6.  
**RNA extraction** - mRNA was isolated and quantified from expanded clones.  
**cDNA preparation** - After quantifying each sample, mRNA was normalized and cDNA was generated using PCR.  
**Quantitative PCR** - Gene expression was detected and quantified by qPCR. Use of Taq Buffer. Cells were scraped off and placed in the appropriate labeled tube. Concentrations of each sample of protein were quantified with protein assay.

**Clone Morphology**  
Figure 7: Clone 5  
The cells in clone 5 displayed a more teleostrophic morphology. Some cells had a very clear teleostrophic pattern while others appeared to have a more osteocytic pattern.  
Figure 8: Clone 13  
Clone 13 exhibited a more osteocytic morphology.

**Results**



Are you interested in science, technology, engineering or medicine like these Indianapolis area students?

- ❖ Would you rather work with cells, high tech equipment, chemicals and computers than flip burgers?
- ❖ There are numerous programs on the IUPUI campus, the IU School of Medicine, the Simon Cancer Center and Eli Lilly looking for talented high school students just like you to do real life projects.
- ❖ Qualified students are eligible to receive Stipends ranging from \$2,000 - \$3200

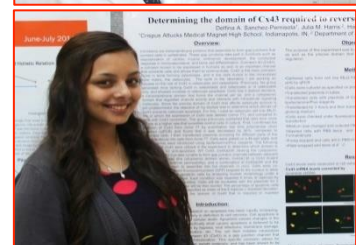
If yes, attend the information meeting for teachers, students and parents:

Saturday January 18 IUPUI Campus Center Auditorium  
10:00a Welcome & Registration 10:30-12 noon Meeting  
**ALL GUESTS MUST REGISTER** at <https://is.gd/Jan18>  
**Please Click and Register Today!**

Park at the Vermont Street Parking Garage, 1000 West Vermont Street  
Campus Center is at 420 N. University Blvd, Indianapolis IN 46202

\*This meeting is for students in grades 9-12 from Indianapolis and Marion County Public Schools, interested in exploring a career in science. The meeting is sponsored by the Indianapolis Project SEED, the IU Simon Cancer Center's Future Scientist and Summer Research Programs and the Indiana CTSI Project STEM. Other outreach program directors are presenting also. **Seats are limited so please Click & Register Today!**

See Details on [Pages 2 & 3](#). Print this flyer at [www.IndianaProjectSTEM.org/jan18.pdf](http://www.IndianaProjectSTEM.org/jan18.pdf)  
[Click here for a comprehensive listing of STEM opportunities available for K-12 students](#)  
Do you have Questions? Contact Elmer Sanders at 317.514.3212 or [elsander@iu.edu](mailto:elsander@iu.edu)



# 2020 Paid \$\$\$ Summer Internship Programs

## Which program is best for YOU?

### 1. Project SEED, 8 weeks \$3,200.00

Sponsored by the American Chemical Society. Available to grade 10-12 students from ANY school in the greater Indianapolis area who come from economically disadvantaged families – please see income chart on the website and apply at:

[www.IndyProjectSEED.org](http://www.IndyProjectSEED.org)

### 2. Summer Research Program, SRP, 8 weeks \$3,200.00

Sponsored by the IU Simon Cancer Center. Available to graduating students at the end of grade 12 or early college years 1 and 2. Students must meet NIH criteria to be considered disadvantaged or underrepresented in science. Apply at [www.cancer.iu.edu/srp](http://www.cancer.iu.edu/srp)

### 3. Future Scientist Program, FSP, 6 weeks \$2,000.00

Sponsored by the IU Simon Cancer Center. Available to grade 11 students that attend ANY Marion County PUBLIC school – this includes all IPS and Township Schools. Apply at

[www.cancer.iu.edu/future](http://www.cancer.iu.edu/future)

### 4. Project STEM, 8 weeks, Numerous STEM fields!

Available to students in grades 10-12 from ANY school in the greater Indianapolis area and NO background requirement but to be interested in a full immersion research internship in one of numerous STEM related fields including neuroscience, oncology, informatics, bio-medical engineering, and other fields. Students participate as unpaid volunteers:

[www.IndyProjectSTEM.org](http://www.IndyProjectSTEM.org)

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**Information for these programs will be reviewed at 10:30 am Saturday, January 18.**

**Information:** [www.IndianaProjectSTEM.org/jan18.pdf](http://www.IndianaProjectSTEM.org/jan18.pdf)

**Location:** IUPUI Campus Center basement auditorium, 420 N. University Boulevard

**Parking:** Vermont Street Parking Garage, 1000 West Vermont Street, Indianapolis IN

**All Guests MUST register:** <https://is.gd/Jan18>

*For information on these programs and STEM opportunities for younger students, please contact:*

Elmer Sanders

Director of K-12 Education Outreach

IU School of Medicine, Indiana CTSI

[elsander@iu.edu](mailto:elsander@iu.edu)

(317) 278-2817

### Page 3 Location and Parking

IUPUI Campus Center is located at 420 North University Boulevard, Indianapolis, IN 46202. Vermont Street Parking Garage is at 1000 West Vermont Street

From West Street, please enter the IUPUI campus on New York Avenue. Go one block past University Blvd and turn right on Patterson Street. Go through the open parking lots, stop and cross Vermont Street into the Vermont Street parking garage Visitor section. Leave the white parking card in your car. At the meeting, you will receive a yellow validation card that you can use as payment. The Campus Center is the building next door at the corner of Vermont Street and University Boulevard. Proceed to the Theater Auditorium on the Basement Level.

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Click this Google Map with Campus Center and Garage highlights to map out your trip.  
<https://www.google.com/maps/@39.7742045,-86.1769373,17z/data=!4m2!6m1!1s1lrkfi93J9NEqGnGyl-AJiLw0LJs>

Enter campus on New York Street, turn right onto Patterson, the next street after University. Patterson ends at the Vermont Garage (G) next to the Campus Center (CC)

