

# Harbor Branch Oceanographic Institute - FAU Summer Intern Program

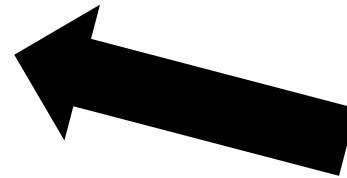
Fort Pierce, Florida

Nic Vitari



# What is this program?

- An immersive internship in marine science or technology. Open to qualified undergraduate and graduate students, the 10-week program is designed to provide hands-on experience in a research environment in multiple areas.
- Each student is assigned to a mentor in one of the following disciplines:
  - Aquaculture and Stock Enhancement
  - **Biomedical and Biotechnology**
  - Marine Ecosystem Health
  - Ocean Dynamics and Modeling
  - Ocean Engineering and Technology
  - Ocean Exploration
  - Outreach and Informal Education



**What I did this summer**

# What is this program?

- Interns have laboratory or other responsibilities, which is determined by the mentor and field of study.
- Interns can attend thesis defenses, guest lectures, and video conferences with faculty (including video chat with scientists on deep sea exploration dives) occurring on the HBOI campus.
- This program is a 8-hr a day commitment Monday - Friday, depending on the research. Housing options are given in Fort Pierce.
- There is a stipend of \$4,500
- Program runs from May 28 – August 2

# End Results

- Oral presentation
  - 12 minute talk, 3 minutes for questions
- Written report
  - Length decided by advisor

**Proteasome Activity of Survivin-Reducing Marine Natural Products**

Nic Vučković  
Advisor: Dr. Esther Guzman  
Sponsor: Gertrude E. Steffy Charitable Foundation



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**What are marine natural products?**


- Compounds produced by marine organisms
- Not essential for their survival
- Provide some evolutionary advantage
- Produced by sponges, soft corals, other invertebrates
- Natural products are abundant and chemically diverse
- Medicinal use
- other purposes



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**Survivin**

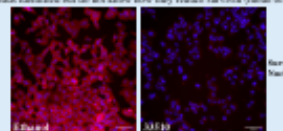
- An inhibitor of programmed cell death (apoptosis)
- Plays a vital role in cell division
- Abnormally expressed in most cancer cells
- Potential target for cancer therapeutics



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**What has already been done?**

- Prior to my arrival, there was a screening effort to identify compounds that reduce survivin levels in cancer cells
- Leads identified but do not know how they reduce survivin (mode of action)



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**Ubiquitin-Proteasome Pathway**



Survivin is degraded via the ubiquitin-proteasome pathway

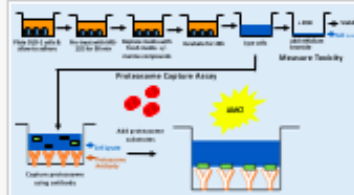
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**Hypothesis**

We hypothesize that cells treated with marine natural products that reduce survivin may increase proteasome activity

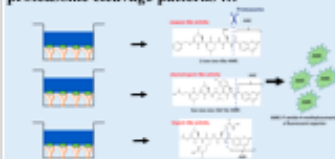
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**Proteasome Capture Assay**




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**Three substrates allow us to view all three proteasome cleavage patterns ...**



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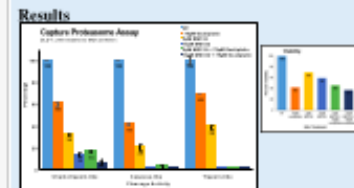
**Results**



MG132 Proteasome inhibitor + 1574 + Thalapsin Reduces cellular proteasome activity to control

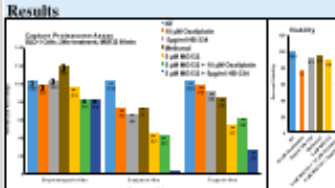
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**Results**



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**Results**



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**Conclusions**

- The capture proteasome assay was set up
- A decrease in proteasome activity with MG132 was observed
- The unexpected result with oxaliplatin seems to be due to cytotoxicity
- The compound 1574 does not seem to act by the proteasome pathway to reduce survivin
- Further experiments need to be done to confirm this observation

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**Acknowledgements**



Tara Pitt, Dr. Esther Guzman, Kirsten Tindberg

The Gertrude E. Steffy Charitable Foundation

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**Thank you! Questions?**



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# How to apply

- Online application form
- Due March 1 annually
- Three (3) letters of rec
- Resume
- One page statement of purpose (research interest and experience)
- Official transcript sent

# Why was I chosen???

**I don't know... but I asked my mentor to find out**

- Grades – minimum GPA
- Previous research experience
- Personal statement reflected my goals were similar to what she does
  - Talked about immunology --> she's an immunologist
- These are not universal, just why MY PI decided

# Thank you!

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