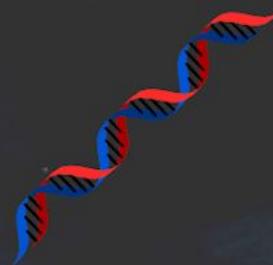
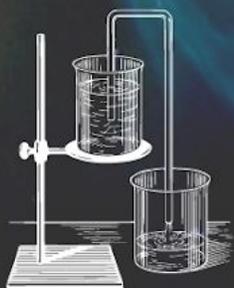


CELL-SCIENCE INTERNSHIP: 2019 ANNUAL REPORT



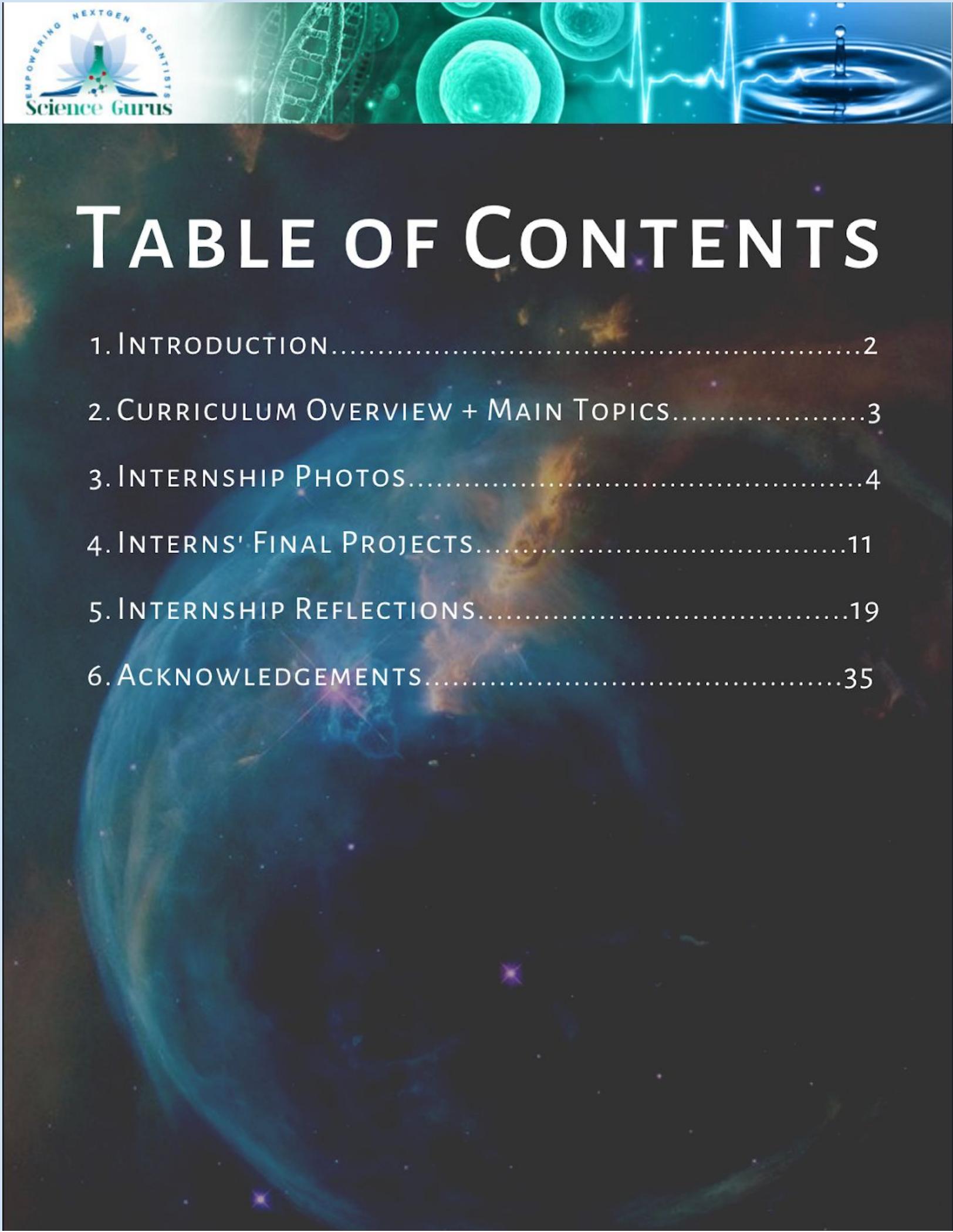


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INTRODUCTION

THE CELL-SCIENCE INTERNSHIP PROGRAM, ORGANIZED AND EXECUTED BY THE SCIENCE GURUS ORGANIZATION IS AN INTENSIVE SEVEN-WEEK PROGRAM THAT EXPLORES THE TOPIC OF CANCER BIOLOGY, DRUG DEVELOPMENT, AND DRUG THERAPIES. THIS PROGRAM STRIVES TO TEACH THE IMPORTANCE OF BIOINFORMATICS, TARGETED THERAPY, IMMUNOTHERAPY, AND MORE CONCERNING THE OVERARCHING PROBLEM OF CANCER WITH THE INTENTION OF NURTURING YOUNG MINDS TO POTENTIALLY ADVANCE THE INDUSTRY TO PRODUCE MORE RESULTS IN THE NEAR FUTURE.

THE CLASS IS STRUCTURED AROUND LECTURES GIVEN BY GUEST SPEAKERS WHO ARE PROFESSIONALS AND EXPERTS IN THEIR RESPECTIVE TOPICS. EACH CLASS FEATURES TWO TO THREE GUEST SPEAKERS THAT PRESENT IN-DEPTH ABOUT THEIR TOPIC, WHETHER IT BE STEM CELL THERAPY OR THE PROCESS OF DRUG DEVELOPMENT. THE SPEAKERS ALL COME FROM BIG COMPANIES SUCH AS GENENTECH, CALICO LABS, ASTEX PHARMACEUTICALS, AND MANY MORE.

THE INTERNS' KNOWLEDGE IS PUT TO THE TEST THROUGH TWO PRESENTATIONS OVER THE COURSE OF THE PROGRAM, ONE AT THE HALFWAY POINT AND THE OTHER AT THE VERY END. THE FIRST PRESENTATION IS AN INDIVIDUAL PRESENTATION ABOUT A SPECIFIC TYPE OF CANCER. THE INTERNS ARE TO RESEARCH AND PRESENT IN EXTENSIVE DETAIL ABOUT THE VARIOUS FACTORS THAT PLAY INTO THAT CANCER AND THE RESULT OF CANCER ON THE HUMAN BODY. THE FINAL PRESENTATION IS DONE WITH A PARTNER. THE FINAL PRESENTATION FOCUSES ON THE STUDY OF A SPECIFIC GENE OR A GENE PATHWAY. THE INTERNS RESEARCH THEIR GENE USING SPECIFIC BIOTECH DATABASES SUCH AS UNIPROT AND CBIOPORTAL, ALL OF WHICH THEY WILL LEARN TO USE DURING THE COURSE. THESE PRESENTATIONS ENSURE THAT THE INTERNS RETAIN THE WEALTH OF KNOWLEDGE THEY LEARN OVER THE COURSE OF THESE SEVEN WEEKS. THE FINAL PRESENTATION IS ACCOMPANIED BY A FORMAL RESEARCH PAPER WRITTEN ABOUT THE SAME GENE/GENE PATHWAY THEY ARE PRESENTING ON.

THE INTERNSHIP ENDS WITH A CELEBRATORY EVENT WITH THE INTERNS AND THEIR FRIENDS AND FAMILIES AS WELL THE SCIENCE GURUS ORGANIZATION AS A WAY TO CONGRATULATE THE INTERNS ON ALL THEIR PROGRESS.

CURRICULUM OVERVIEW



2019 Cell-Science Summer Internship Program

Date and Time: June 17 – Aug 4, 2019; Monday and Wednesday, 6-9.15pm*
Location: Golden India (Ardenwood Plaza), 4918 Paseo Padre Pkwy, Fremont, CA 94555



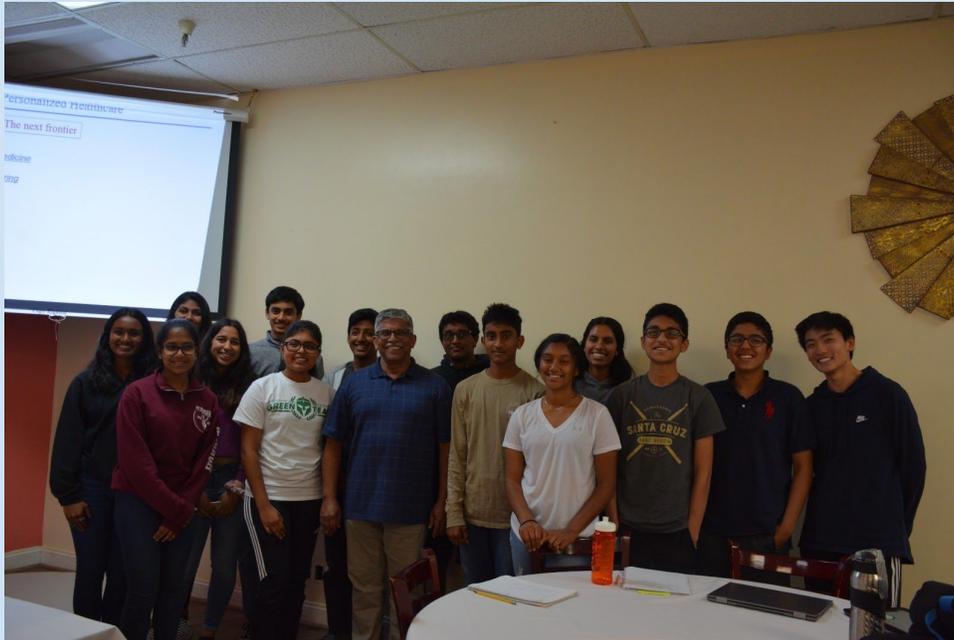
Day	Date	Instructor	Hours	Class	6.00-7.00pm	7.00-8.00pm	8.00-8.15pm	8.15-9.15pm
Mon	6/17/19	Jagath Reddy Junutula	3	Meet and Greet; Goals of Internship	Introduction to Cancer Biology & Cancer Basics	Break	Class	Cancer Signaling
Wed	6/19/19	Chakk Ramesha/Pradeep Frenandes	3	Drug Discovery & Development - Overview	Drug Discovery & Development - Overview		Class	Cell Signaling/Systems Biology
Mon	6/24/19	Kiran Mukhyala/Jagath Reddy Junutula	3	Bioinformatics tools/applications	Bioinformatics tools/applications		Class	Targeted Therapeutics-Biologics
Wed	6/26/19	Chitra Sharma/Suchit Jhujhunwala/Vasu Jamma	3	GMP/FDA Compliance	Small Molecule Drug Discovery		Class	Bioinformatics tools/applications
Mon	7/1/19	Sanjeev Redkar/Sreedhara Alavattam/Kiran Mukhyala	3	Small Molecule Manufacturing & Formulation	Large Molecule Manufacturing & Formulation		Class	Bioinformatics tools/applications
Mon	7/8/19	Raji Pingali/Aparna Gandhari	3	Workshop: "Preparing Effective College Applications"	Workshop		Class	Bioinformatics tools/applications
Wed	7/10/19	Zora Modrusan/Student speakers	3	Cancer Diagnostics-NextGen Sequencing	Group 1 (6)		Class	Group 1 (6)
Thu	7/11/19	Student speakers	3	Group 2 (10)	Group 2 (10)		Class	Group 2 (10)
Sat	7/13/19	Bob Figari (11-3pm)	4	Workshop: "Effective Content Development & Delivery"	Workshop			
Mon	7/15/19	Surya Sankurabi/Heather Maecker	3	Business Development	Cancer Immunotherapy		Class	Bioinformatics tools/applications
Wed	7/17/19	Ram Mandalam/Vish Kata	3	Stem cell Therapeutics	Biologic-analytics		Class	Bioinformatics tools/applications
Mon	7/22/19	Talat Ashraf/Jagath Reddy Junutula	3	Clinical Trail Design & Execution	Pharma/Biotech careers		Class	Bioinformatics tools/applications
Wed	7/24/19	Ganesh Kolumam/John Storella	3	Interplay between Cancer and Inflammation	Overview to Patents-IP		Class	Bioinformatics tools/applications
Mon	7/29/19	Sinnathambay Gomathinayagam/Gavin Choy	3	Cancer Biomarkers	Drug Dosing, Delivery & Metabolism		Class	Bioinformatics tools/applications
Wed	7/31/19	Sreedhara Alavattam/Shaliesh Raichura	3	Nanoparticle Therapeutics	Clinical Operations & Execution		Class	Bioinformatics tools/applications
Sat	8/3/19	Final Project Presentations	6	Final Project Presentations (1pm-6pm)	Final Project Presentations		Class	Final Project Presentations
Sun	8/4/19	Science Gurus Annual Day	3	Certificate presentations (8-9.30pm)	Certificate presentations		Class	Certificate presentations

MAIN TOPICS

- INTRO TO CANCER BIOLOGY + CANCER BASICS
- DRUG DISCOVERY AND DEVELOPMENT
- BIOINFORMATICS
- TARGETED THERAPY
- SMALL MOLECULE DRUG DISCOVERY
- LARGE MOLECULE MANUFACTURING AND FORMULATION
- CANCER IMMUNOTHERAPY
- STEM CELL THERAPY
- CANCER BIOMARKERS
- NANOPARTICLE THERAPEUTICS

Photos From Internship

Topics: Drug Discovery & Development - Overview & Cell Signaling/Systems Biology
Speaker: Chakk Ramesha & Pradeep Fernandes



Topics: Bioinformatics Tools/Applications & Targeted Therapeutics - Biologics
Speakers: Kiran Mukhyala & Jagath Reddy Junutula



Topics: GMP/FDA Compliance, Small Molecule Drug Discovery, & Bioinformatics tools/applications
Speakers: Chitra Sharma, Suchit Jhujhunwala, & Vasu Jamma



Topics: Small Molecule Manufacturing & Formulation & Large Molecule Manufacturing & Formulation
Speakers: Sanjeev Redkar & Sreedhara Alavattam



Topic: Preparing Effective College Applications (Workshop)
Speakers: Raji Pingali & Aparna Gandhari



Topic: Cancer Diagnostics-NextGen Sequencing
Speaker: Zora Modrusan



Topic: Effective Content Development & Delivery (Workshop)
Speaker: Bob Figari



Topics: Business Development & Cancer Immunotherapy
Speakers: Surya Sankuratri & Heather Maecker

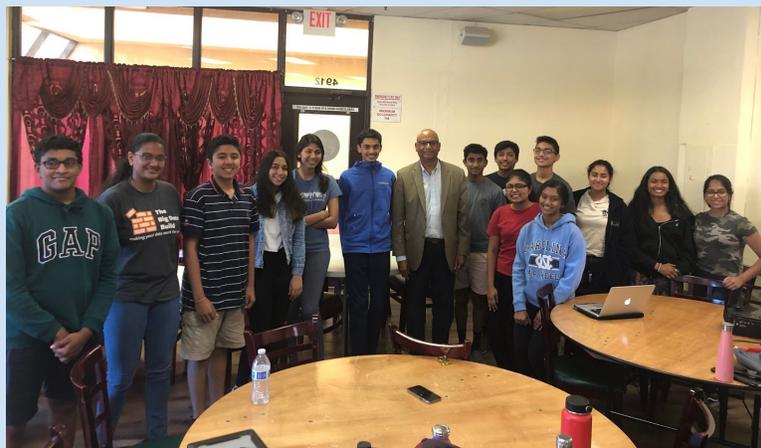


Topics: Stem cell Therapeutics & Biologic-analytics
Speakers: Ram Mandalam & Vish Katta





Topics: Clinical Trial Design & Execution & Pharma/Biotech careers
Speakers: Talat Ashraf & Jagath Reddy Junutula



Topics: Cancer Biomarkers & Drug Dosing, Delivery & Metabolism
Speakers: Sinnathamby Gomathinayagam & Gavin Choy

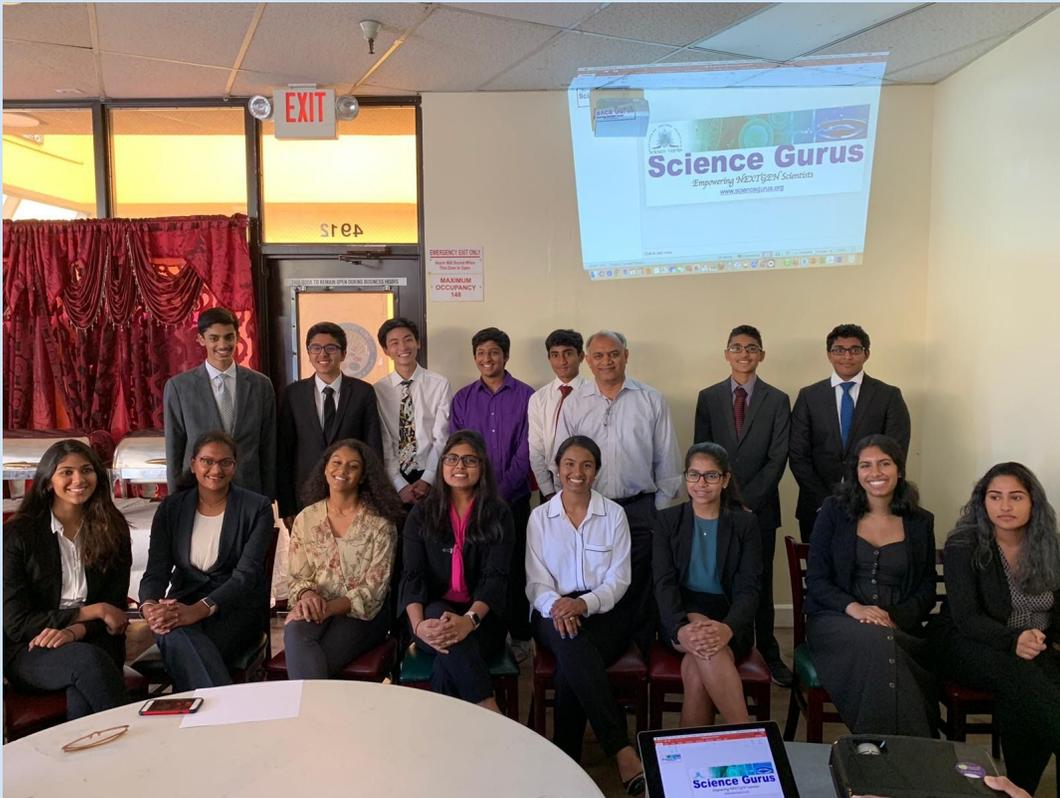




Topics: Nanoparticle Therapeutics & Clinical Operations & Execution
Speakers: Sreedhara Alavattam & Shailesh Raichura



Final Presentation Day



Interns' Final Projects

1. BCL-2 and BCL-2 Inhibitors

Review of Bcl-2 & Bcl-2 proteins in Apoptosis and Cancer

Dheerj Jasuja^{1,3}, Monica Manmadkar^{2,3}

Leland High School¹, Mission San Jose High School², Science Gurus: Cell-Science Internship³
August 3, 2019

ABSTRACT

The Bcl-2 family has long been the target of investigation due to their integral role in apoptosis, or programmed cell death, as they are pro-apoptotic or anti-apoptotic proteins that interact to enable or inhibit apoptosis. This important role in the cell makes Bcl-2 family members prime targets for carcinogenesis as avoiding cell death enables the cancer cell to divide indefinitely and with additional mutations. Specifically, the Bcl-2 protein appears to be one of the key proteins overexpressed in cancer, suggesting that its anti-apoptotic functions are exploited by the cancer cells. These findings have made Bcl-2 a target of pharmaceutical companies who wish to inhibit this protein so that the mechanisms of apoptosis are free to destroy the cancer cells. Thus, it is paramount to examine and understand the Bcl-2 gene and the Bcl-2 protein in order to enable effective drug development and potentially cure cancer by preventing the overexpression of the gene or by fully inhibiting the protein once a tumor has developed.

Mutations in the BRAF Gene and its effect on the MAP Kinase Pathway

Kamya Krishnan^{1,3} and Tanya Mehta^{2,3}

Monta Vista High School¹, Dublin High School², and Science Gurus: Cell-Science Internship³

August 3, 2019

Abstract

The BRAF gene and the B-raf protein play a crucial role in regulating the MAP kinase/ERKs signaling pathway, which affects cell division, differentiation, and secretion. Mutations in this gene are associated with cardiofaciocutaneous syndrome, a disease characterized by heart defects, mental retardation and a distinctive facial appearance. Mutations in this gene have also been associated with various cancers, including non-Hodgkin lymphoma, colorectal cancer, malignant melanoma, thyroid carcinoma, non-small cell lung carcinoma, and adenocarcinoma of the lung.¹ With BRAF being a major oncogene, it's most common mutation types are being targeted in drug research so that survival rates of melanomas and colorectal cancers can be increased.

Report of the Bruton Tyrosine Kinase Gene

Akshitha M.^{1,3} and Nitya Jain^{2,3}

¹Dougherty Valley High School, ²American High School, ³Science Gurus

August 3, 2019

Abstract

Bruton Tyrosine Kinase or BTK, is crucial in the development, differentiation, and signaling of B-cells. BTK brings together an array of signaling proteins and is involved in cytokine receptor signaling pathways. It is part of the Toll-like receptor pathway which functions to detect pathogens and activate a host defense system. Additionally, BTK also plays a role in transcription regulation, by inducing NF-kappa-b, which is responsible for regulating the expression of around a hundred genes. When mutated, BTK's oncogenic signaling is critical for proliferation and survival of leukemic cells. Today, there are two approved drugs that are given to patients with chronic lymphocytic leukemia and mantle cell leukemia: Ibrutinib and Acalabrutinib. Various other BTK inhibitors are in different phases of clinical trials.

4. CD19 Gene

The Function and Oncological Significance of CD19

Daniel George^{1,3} and Arnav Nagle^{2,3}

¹Kennedy High School, 39999 Blacow Rd, Fremont, CA 94538

²Irvington High School, 41800 Blacow Rd, Fremont, CA 94538

³Science Gurus Cell-Science Internship, 4918 Paseo Padre Pkwy, Fremont, CA 94555

3 August 2019

Abstract

CD19 is the gene that codes for CD19, a 95 kd transmembrane glycoprotein that is essential in a B lymphocyte's precise and specific responses. CD19 functions as a co-receptor for the B-cell antigen receptor complex and decreases the threshold for activation of downstream pathways and cell response to antigens. It is an intrinsic protein of B-cell development and immune response. This report analyzes the expression, domains, mutations, copy number alterations, and pathways for CD19 as well as the structure, function, and indications of drugs that interact with it, including bispecific T-cell engagers, chimeric antigen receptor T-cell therapy, Fc engineered antibodies, glycoengineered antibodies, and antibody-drug conjugates.

Report of Cluster of Differentiation 79 (CD79A and CD79B) and Polivy

Thrisha Praveen^{1,3} and Aditi Singh^{2,3}

¹University Preparatory Academy, ²Monta Vista High School, and ³Science Gurus: Cell-Science Internship

August 3rd, 2019

Abstract

CD79A and CD79B are part of the BCR complex that works to activate B-cells. In cancer, CD79A, an oncogene, encourages proliferative signaling and metastasis, but CD79B, also an oncogene, helps the tumor evade apoptosis. CD79A and CD79B are both heavily mutated in DLBCL, making them suitable targets for finding a treatment. Polivy is currently the only approved targeted therapy targeting the CD79B gene and is commonly used alongside chemotherapy.

Report on EGFR and EGFR Antibodies

Avinash Saripalli^{1,3} and Dhruv Kanumury²

1-American High School, 2-Archbishop Mitty High School, 3-Science Gurus: Cell Science

Internship

July 20, 2019

Abstract:

EGFR, or epidermal growth factor receptor, is a growth factor receptor tyrosine kinase for ligands of the EGF family and is important in activating several signaling cascades. Research has shown that EGFR is overexpressed in multiple cancers, head and neck, ovarian, cervical, bladder, oesophageal, breast, endometrial and colorectal cancers. This overexpression of EGFR on the cell membrane can lead to overactivation of certain signaling pathways, such as the MAPK or the PI3-kinase AKT pathways, which in turn can lead to uncontrolled cell growth and tumorigenesis. As EGFR mutations are present in a wide range of cancers, it has become a major target in the battle against cancer.

Report on Isocitrate dehydrogenase-1 (IDH1) and Tibsovo

Nikitha Kalahasti^{1,3} and Trisha Parthasarathi^{2,3}

¹Presentation High School, ²Silver Creek High School, and ³Science Gurus: Cell-Science Internship
August 3, 2019

Abstract

Isocitrate dehydrogenase-1 (IDH1) plays a prominent role in cellular metabolism, a vital process to maintain life. It is involved in the citric acid cycle gene signaling pathway and produces the important metabolite alpha-ketoglutarate (α -KG). IDH1 is a commonly mutated gene across various types of cancers, with the most common mutation being point mutations at residue R132. The mutations lead to the production of 2-hydroxyglutarate (2-HG) that consequently causes the formation and growth of tumors. The only approved targeted therapy drug, TIBSOVO, inhibits mutations at R132.

Report of PDL1 and Anti PDL1 antibodies' Function and Profile analysis

Sanjay Harinatha^{1,3} and Jon Choy^{2,3}

¹California High School, ²Burlingame High School and ³Science gurus: Cell-science internship

August 2, 2019

Abstract

The CD274 gene encodes for protein programmed death ligand receptor one or PD-L1. When PD-L1 binds with its ligand, PD-1, it initiates apoptosis- a crucial interaction not only in the regulation of T-cells, but also in fighting Cancer. In this report, we discuss PD-L1 inner workings, complexions and its role in the immune system in order to demonstrate its applications in eliminating Cancer.

Internship Reflections

Aditi Singh



I first applied for the Cell-Science Internship with absolutely no expectations, but looking back, it's become one of my most favorite memories over summer. From meeting so many new people, to learning so much about cancer, I thoroughly enjoyed this internship. Although some lectures were definitely more engaging than others, they were all equally as knowledgeable. Before I knew it, I started looking forward to coming to this internship, not only to listen to the lectures, but also to meet up with the new friends I made through this program. I especially liked the projects we were assigned because it helped us apply everything we learned through our different speakers to our own topics. I can honestly say that I have learned a lot through this internship, most of which I wouldn't have had the opportunity to learn if not for this Internship. My most favorite lecture was probably the lecture about Cancer Immunotherapy. I made so many new friends through this internship that I otherwise would never have met and I can honestly say I'm grateful for each and every one of them. Overall, I believe that this internship was one of the best experiences of my high school career, and it's one that I will most certainly never forget.

Akshitha Mamidi



I took part in this internship during the summer before my senior year. It was not only informational regarding cancer, but taught me skills I would have not learned in school. This internship showed me the variety of jobs available in the biology field. Growing up, I was trained to think that being a doctor was the only realistic job option in the biology field. However, being able to meet and learn from extremely accomplished individuals changed my perspective on the biology field. I learned that it is constantly evolving and changing, and unlike most other areas of study, has new questions being asked and answered everyday. I was exposed to the newest research regarding drug discovery, new biotechnology equipment, and upcoming cancer therapies.

The specific topic of this internship was cancer and learning how it operated at the cellular level. With the guidance of the mentors, I learned researching skills and data analysis at a very high educational level.

However, what the most important aspect of this internship were the skills that could not be learned in a classroom setting. I was taught the importance of networking and maintaining healthy relationships with one's colleagues and peers. Furthermore, sessions on college applications, public speaking, and even a patent lawyer attest to the fact that this internship can be beneficial for any high school student, and not just those who are particularly interested in the STEM fields.

Arnav Nagle



Avinash Saripalli



Daniel George



Dheerj Jasuja



The Cell-Science Internship was one of the most engaging academic experiences that I've had. It taught me not only about cancer but also about career pathways in the biomedical field. I also had the great opportunity of meeting motivated students who added their unique perspectives to discussions and livened up the meetings. I found their presentations on both their selected cancer and assigned genes to be very professional and informative. Additionally, I found the experts who lectured on different topics to be passionate, committed, and approachable. They did not hesitate to answer our questions or engage in a dialogue with an individual intern. Moreover, the assignments we had to do, although they were challenging at times, were fun as I was able to learn about subjects that I may have never learned about at school, and I will look back upon my notes that I have taken during this internship as an invaluable resource. Finally, I would like to thank you for accepting me into this internship as I never would've been able to have this amazing experience if you hadn't taken a leap of faith and selected me for it. On the whole, though, I truly believe that this internship will be an unforgettable experience for all of the interns.

Dhruv Kanumury



This internship has really been an eye-opening experience for me. I came in without a lot of knowledge on the cancer field in hopes of learning something new. Little did I know however that this amazing opportunity would inspire me to look into another field of science study. Learning about the bioinformatics, cancer on the molecular level and the hard work put into making a drug really caught my curiosity as this is a side of medicine that I was completely unaware of. I was able to gain important skills such as learning what it takes to create a proper research report as well as how to read a patent, all skills that I hope to apply in the future. Finally the best part of the internship was being able to interact with students all over the Bay Area who share the same passion for science such as myself. By working with other talented individuals not only resulted in the exchange of ideas and passions but unbreakable bonds. All I can say is that it was a summer well spent and that if it was not for such an amazing opportunity I do not think I would have gained all the skills which I had obtained.

Jonathan Choy



My time at science gurus exceeded my expectations; this was an experience that will stick with me for a long time. Walking into Golden India restaurant for the first session, I had no idea what to expect. A seven week long internship - two days a week and spanning over 42 hours - in a restaurant. I don't know; that seemed like an awful lot of time to spend in a restaurant learning about cancer and all its different facets. However, what I thought it would be and would it became was very different. Speakers from biotechnology companies with all different jobs and roles at each session gave me a huge variety of information and exposed me to potential fields I may be interested in the future. This combined with weekly homework assignments taught me so much, and gave me an idea of my interests in the field. Beyond science though - and maybe one of the best things that came out of this internship - I met new people. Having supportive, interesting, and friendly group of interns truly made the internship. Science fascinated me and I enjoy learning about it, but there's something to be said about learning with people that have a common interest.

Kamya Krishnan



As a senior, I could have been spending my summer enjoying time with my friends or just relaxing and preparing for college, but I'm happy that I chose to be a part of the Science Gurus cell-science internship instead. Having taken Chemistry and Biology at an advanced level previously, I was able to dive deep and learn so much more about specific research and current advances in the cancer epidemic. I have not only learnt the reasons as to why Cancer is so difficult to cure, but I have also learnt the multiple pathways involved and how finding cures to effectively inhibit or activate these pathways is the biggest goal for our next generation. Meeting new experts that were all extremely qualified for their positions, and that had intensive backgrounds in their professions was very humbling and amazing to be around. I was able to hear from a variety of professions, ranging from people in the drug development side, to people who were patent writers, to people that started their own cancer therapy businesses. It gave me insight on not just modern cancer research, but on how businesses, advanced technology, and manufacturing play a large role in the creation and publicity of a cancer drug. This internship has provided me clarity on the professional path I want to pursue in college and has taught me that the job market is ever changing and growing, so I should be excited for the future of drug development because I will someday be a part of that future.

Monica Manmadkar



I really enjoyed doing this internship because it not only gave me a chance to explore what exactly drug discovery is but also let me gain more insight and exposure to the different types of careers that a scientist can have. I think that my favorite part of the internship is when we got to hear about what different careers people have in the sciences and how their lives are. I think that was a real eye opener for me, and it was one of the most integral parts of the internship that made it unique. Another part that I really enjoyed was going to Genentech. I had never seen a pharma company before and I enjoyed the trip down to SF and the tour that we got there. I would like to thank you for this opportunity and for accepting me into the program even though I was a junior. This truly has been a learning experience and made my summer unforgettable.

Nikitha Kalahasti



I am extremely glad that I applied for the internship. This past summer was one of the best educational experiences I have had and I absolutely enjoyed it. The lectures that we had not only increased my knowledge for the field, but they also showed me the various ways in which I could contribute to this extremely large field.

Every speaker was passionate and knowledgeable, through their lectures they helped me become more interested. I was able to confirm that this field was for me as a result of the experience that I had. The hands on experience I have gained has been extremely helpful as well. Being able to do research on one type of cancer and present about helped me learn about the various informational sources. The student led presentations also helped me learn about cancer itself in a setting where we supported each other. The people I met at this internship are some of the smartest people I know and are amazing people as well. The ability to become friends with 15 others over a few months was an amazing experience. The gene research project was very very helpful. Being able to learn about the various bioinformatics tools is helpful for the future when I choose to use them. The internship provided me with the opportunity to learn how to use them at an earlier age. The research process also exposed me to what the procedure is like when writing an in depth scientific report. Overall, this internship provided me with opportunities I never expected to be a part of and I am extremely thankful that I got to be a part of it.

Nitya Jain



Sanjay Harinatha



Going into the internship, I was unsure of my respective field of study and I was leaning more towards the hands on and clinical aspects but that changed. Hearing lectures from professionals who have experience in both fields helped me gain an insight on the benefits and drawbacks. Another key lesson I learned from the internship was public speaking, I believe that after that lecture I gained a bit more confidence in presenting and am applying the skills I learned throughout my senior year. Learning about the impact that research has on the medical world was a key motivator in choosing a field of study. The field of oncology is what I want to dedicate my life towards, maybe it be becoming a clinical oncologist or by doing research in a lab. This internship has helped me not only helped me determine my area of interest but helped me get a headstart towards the field. The order of the presenters helped start off with the basics and develop into more complicated topics/ areas of studies and I enjoyed that towards the end, the lectures were focused on the future because that will impact us the most and it really helped us gain a head start on learning about such technologies. Although the homework was rigorous, I believe that it helped me connect topics that we learned in class and kept me on my feet about the internship. The final presentation was a great closure to the internship and was a good reflection of a formal college report/presentation. The field trip was one of the best parts of the internship. Going through the labs, I was able to see the mass amounts of the equipment and learn that many different fields are involved in creating such a large biotech company. After the tour, I understand that I didn't want to be in the labs with large equipment but in a much smaller lab working with other co workers to develop ideas and expand into the future. Many of the people that led the tours were extremely helpful and really motivated in helping us.

Tanya Mehta



Thrisha Praveen



Being part of the Cell-Science Internship this past summer has given me a new perspective on the future. By taking part in lectures taught by esteemed scientists in the field of cancer as well as others in various professions, I now have even more excitement for the future of science, especially in the field of cancer research. This excitement makes me more eager to learn more about cancer therapy as well as more hopeful that I can also help in this fight in some way in the future. The lectures on stem-cell therapeutics, cancer immunotherapy, and next-gen sequencing were some of my favorites, but one lecture that really stood out to me was the lecture on patents and intellectual property, especially regarding advances in biology. Something that Mr. Storella said that really interested me was that he got into the field because he loved explaining science to others. Once he said that I thought to myself: "that applies to me, maybe this can be a future career option?" After analyzing patents for significant biological innovations and hearing more about Mr. Storella's experiences, I started considering patent law as a career to pursue, something I never could've imagined before taking part in this internship. Besides all the learning and exploring I experienced, I was also able to form strong connections to the other interns over this process, for which I am very thankful. I am so grateful for being given this opportunity as it has truly guided me and challenge me, in ways I hadn't experienced before.

Trisha Sarathi



I had always been fascinated by biology and human anatomy, but had never gotten a wholesome experience from school courses or extracurriculars. Participating in the Science Gurus, Cell-Science Internship helped me experience that combination of research and hands on experience. Participating in the internship opened up a whole new door of opportunity for my future. I am now confident about the major I want to pursue in college and well informed about the countless career paths that I can take. Having learned from highly recognized professionals in various fields, such as bioengineering, medicine, education, and law, among others, helped me understand the various ways in which biology can be incorporated into many career pathways. Prior to the internship, I thought that pursuing medicine as a physician would be the only path that would satisfy my passion for biology. However, I was mistaken; there are countless careers that employ biological sciences in different manners. The Cell-Science Internship far exceeded my expectations of the material we would learn and the amount of work assigned. The program consists of rigorous material and requires dedication to learn the concepts well. This internship taught me a lot about cancer biology and bioinformatics through lectures, videos, articles, and peer presentations. The internship not only kept me busy with topics that fascinated me, but also pointed me in the direction of new areas of study. Overall, this was an unparalleled experience that helped me gain clarity about my academic interests and future career goals.

Acknowledgments

We would like to sincerely thank Dr. Jagath Reddy Junutula for taking the time and effort to put together this amazing program. We would also like to thank each and every one of the presenters who took time out of their busy schedules to pass on some of their knowledge and passion to us, especially Kiran Mukhyala for giving us the tools and the guidance needed to complete our bioinformatics project. Thank you also to Anay Limaye, who patiently gave us advice on our projects as well as college and internships. We are immensely grateful to the Science Gurus Organization for giving us the opportunity to participate in the Cell-Science Internship. This unforgettable experience from the past summer will be invaluable to all of us in college and beyond. Finally, we would like to thank our parents for supporting us through this internship.

Editors: Thrisha Praveen and Aditi Singh