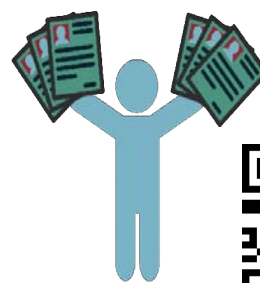


**RUTGERS CANCER INSTITUTE OF NEW JERSEY**

# **RUTGERS YOUTH ENJOY SCIENCE** ***RUYES WATCH***



Dr. Sunita Chaudhary, Principal Investigator for Rutgers Cancer Institute's Rutgers Youth Enjoy Science (RUYES) Program with year 1 and 2 participants: High School Science Teachers, Undergraduates, and High School Students.



## **In this issue:**

- \* Orientation Week
- \* Editorial
- \* Collaborations
- \* Mentor Spotlight
- \* Experiences & Research
- \* Research Poster Symposium

The Rutgers Youth Enjoy Science (RUYES) program seeks to encourage youth from groups that are underrepresented in the biomedical sciences to pursue cancer research and healthcare careers.

Applications for Summer 2023 will be open through February 17, 2023

For more information visit:  
[www.cinj.org/ruyes](http://www.cinj.org/ruyes)  
or email:  
[RUYES@cinj.rutgers.edu](mailto:RUYES@cinj.rutgers.edu)

**RUTGERS**  
Cancer Institute  
of New Jersey  
**RUTGERS HEALTH**



# The RUYES Introduction and Orientation

Deanna Ebert

*Student at Linden Public High School*



During orientation, trainings on how to navigate as a researcher, such as familiarity with databases and how to read scientific papers were offered. Participants were given a tour of Rutgers Cancer Institute of New

Jersey including tours of some of the labs and a brief overview of what specific labs were researching. It was awesome to see the labs for the first time with all the tools and machines that researchers were using. It was intriguing to see the projects underway.

Throughout the week, year 1 and year 2 participants mingled through different activities and icebreakers. In some trainings, students were matched with high school science teachers and other students to get a broader understanding of the different types of cancer and different ways to teach middle school students about cancer.

Towards the end of the week, RUYES had a luncheon where the postdoc mentors or principal investigators met the student or high school teacher they were matched with in person for a more specific overview of the research to be conducted.

Many of the mentors gave presentations on what their labs' objectives were to all of the RUYES participants. It was inspirational to hear the research of other labs. Finally, RUYES had given the resources necessary throughout orientation week to help prepare for the research that would be conducted as well as the support in building friendships and a network along the way.



## RUYES EDITORIAL

### The Eye-opening Experience of Research

Pramila Natarajan

*Science Teacher at Linden Public High School*

Thin, fragile, sunken eyes, muscles stuck to the skin – this last image of my father is etched into my mind. Within a year of cancer diagnosis, my well-built strong father turned into this frail person. The moment I received the email from my mentor in the Rutgers Youth Enjoy Science (RUYES) program, Dr. Xue Yang, describing the research happening in the lab, particularly about cancer cachexia, I was hooked. Rutgers Cancer Institute of New Jersey's laboratory of Wenwei Hu, PhD, which I am honored to be a part of, is researching cachexia, which is a life-debilitating phase of many cancer patients' lives. Cancer patients with advanced disease often exhibit cachexia, a condition characterized by a significant loss in body weight predominantly from loss of skeletal muscle and fat tissue, in addition to loss of appetite, low tolerance for chemo and radiation therapies, and reduced quality of life.

Most of us, myself included, thought that research was about white coats, spectacled nerdy people running around carrying colorful flasks and creating, inventing, and discovering science. No amount of training and journal reading would have prepared me for this real-life experience at Rutgers Cancer Institute. Nano, micro, elute, supernatant became a part of my daily vocabulary. A nano and a micro could make a huge difference in an experiment and failure to measure/pipette the right amount could lead to disastrous results.

Patience is certainly a virtue in science. Scientists repeat each experiment so many times to make sure they achieve accurate results. They must repeat the same procedure for days, months, and sometimes years before they are sure of the results. Research in science is really about collaboration, cooperation, and teamwork. Lab meetings, discussions, and peer to peer interaction are all part of a researcher's daily workload. Experimental design, planning of experiments, data collection, mathematical analyzing, critical thinking and analyzing are all part of the researcher's repertoire too.

Researchers are simply trying to answer a particular scientific question that could, in future, make a world of difference between life and death to someone out there or make an individual's quality of life a lot better. Of course, it helps if you are brilliant and intelligent but more than all of that, you should be able to persevere and have the inherent curiosity to solve problems.

Finally, in whatever field of research you might be, you should have the ability to write. A researcher is always writing papers, writing, and preparing talks, and often writing grant proposals. All in all, a big thank you to the RUYES program and to all my fellow mates in Dr. Hu's lab for opening my mind to the untold sacrifices of a group of people who tirelessly work to make sure that cancer does not rule humankind in any manner in the future.

*For more information on Hu Lab visit <https://www.cinj.org/WenweiHuLab>*



BioCONNECT Oncology Leadership Development  
and Rutgers Youth Enjoy Science Programs  
Cecila Bonilla Herrera  
*Student at New Brunswick Health Sciences Technology High School*

**“My participation in the BOLD program has positively impacted my vision of who I want to be.”**  
**-Cecila Bonilla**

Attending the BioCONNECT Oncology Leadership Development (BOLD) program as a Rutgers Youth Enjoy Science (RUYES) trainee, has been truly an engaging and informative experience. Even though the program lasted for only five days, the amount of information introduced was amazing. Before attending BOLD at Rutgers Cancer Institute of New Jersey, I had a very broad perspective of career fields in a cancer setting. I was only aware of careers such as physicians, surgeons, and nurses. While attending the program, I was introduced to a wide variety of careers such as pathology, genetic counseling, and oncology.



Furthermore, the BOLD program was such an enriching and life-changing experience. We did fun activities focused on [Decoding Cancer featuring BioCONNECT](#) and understanding how cancer affects people. Through these activities, I was able to get a very clear picture of what treating cancer looks like and how patients are affected. I realized that cancer could happen to anyone, but it does not mean it is the end. In addition, I dove into this world where a wide range of professionals help patients every day through their diagnosis, treatment, and recovery from cancer. This furthered my understanding of cancer as a disease, which made my participation in the Rutgers Youth Enjoy Science (RUYES) program a bit easier and less scary.

Overall, the BOLD and RUYES programs are extremely complementary. I came from a background with very little lab or research exposure. I also had limited knowledge of healthcare related to cancer. The BOLD program served as a great help in breaking down complex cancer-related topics into better digestible information. While conducting my research in RUYES, concepts learned in BOLD helped me to realize that there are hundreds of people out there that can and will benefit from research breakthroughs. I am glad I decided to participate in BOLD because it put me in a position to excel in the RUYES program.

My participation in the BOLD program has positively impacted my vision of who I want to be. Initially, I thought there was nothing else than a career as a physician. Suddenly, my eyes are opened to many other career choices that do not involve hands-on patient care. I believe that the BOLD program has been of great influence in terms of deciding on a possible career path for the future.



For more information on BOLD, visit:  
[cinj.org/BOLD](http://cinj.org/BOLD) or email: [BOLD@cinj.rutgers.edu](mailto:BOLD@cinj.rutgers.edu)



## Research Experiences Inspire More Research

Caitlyn Ramdat

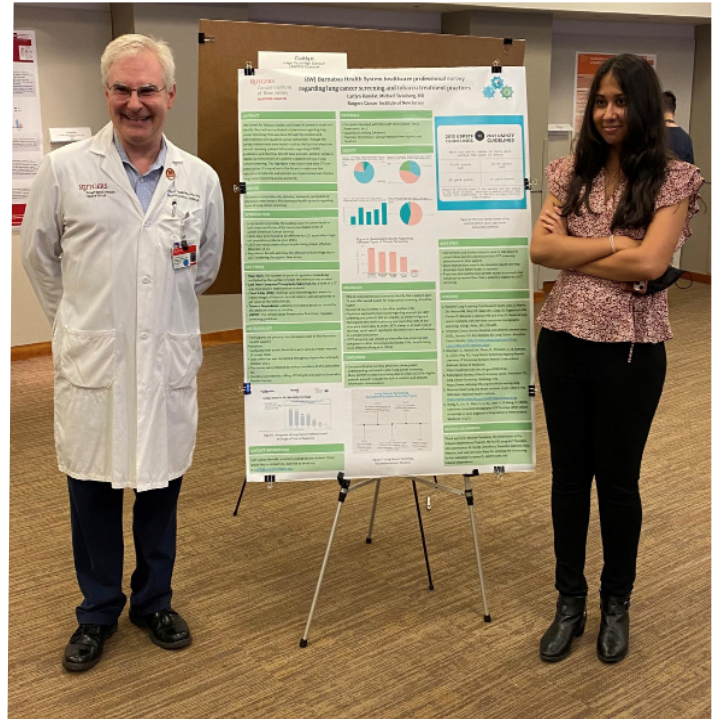
*Former student at High Tech High School;*

*Current undergraduate at Johns Hopkins University*

So much knowledge regarding cancer was acquired by entering the Rutgers University Youth Enjoy Science (RUYES) program. Cancer types are different from each other. These differences are key to the treatment of cancer, as well as how there will never be a singular, monumental “cancer” cure. This experience helped in preparation for conducting future research and brought awareness to common misconceptions about cancer.

Additional skills in navigating communication, presenting, and organization were gained. Developing these soft skills makes the difference in concisely establishing credibility while working smarter, not harder.

Networking was also an important skill, and that was keenly represented through the pinnacle of the summer program, the Research Poster Symposium. During the symposium, all the members of the program presented a poster based on the individual research projects that they had done throughout the summer. It showed how much they connected with their mentors, and how they are continuing to grow as researchers.



The defining factor of why working with RUYES has been so beneficial thus far, however, is because of the community outreach aspect. Working in an environment of cancer exploration and research made it easy to find outlets to share knowledge acquired. RUYES provided a platform to share my passion for cancer research with others. Learning from those who had immense experience in this field offered insight and a realistic perspective.

Over the course of research, I was exposed to in-depth knowledge of lung cancer and the preventative measures that exist to reduce the risk of an individual acquiring it. Snuffing out the smoking of cigarettes is a large part of that individual mission. While screening methods and smoking cessation programs exist for that sole purpose, many people are subjected to cigarette smoke despite not smoking themselves. Being armed with knowledge, my inspiration is to study how the dispersal of specific gases that are found in cigarette smoke cannot be reduced. There is anticipation for what findings might become evident. The RUYES program has continued to nurture my education in cancer research.

*For more information on the Tobacco Center, visit:*

<https://www.cinj.org/patient-care/tobacco-dependence-program>



# Mentor Spotlight

## Chun-Yuan (Tracy) Chang, PhD

Pranavi Kondam  
Student at McNair Academic High School

Through the Rutgers Youth Enjoy Science (RUYES) Program, I was given the opportunity to work as a research assistant in the laboratory of Wenwei Hu, PhD, under the mentorship of Chun-Yuan (Tracy) Chang, PhD. Dr. Chang is a postdoctoral researcher at Rutgers Cancer Institute of New Jersey working on various projects related to colon tumorigenesis mice models.

**Q:** What is the most exciting or rewarding aspect of your career?

**A:** The most exciting aspect is whenever my paper gets accepted for publication. It takes years of research for a paper to get published. Sometimes I get a rejection letter, and it makes me frustrated. Experiments require multiple techniques, controls, and settings. Oftentimes, I will need to research what is best and put in a lot of time before arriving at my results. So, when I receive an email saying my paper will be published, I feel that my work paid off.

**Q:** How and when did you discover you wanted to go into research?

**A:** I joined the lab during my junior year. My first lab was related to chemistry and dealt with different things, such as compounds. After a while, I realized I did not like it because I was not able to see structures with my eyes. I just completed a series of steps, and a machine told me what the structure was. Knowing this, the next summer, I moved to a different lab which I also joined for my graduate program when getting my PhD. I enjoyed this second lab. It dealt with many of the things we do today. I got to do different wet lab procedures such as Western Blots, staining, and cell cultures.

**Q:** What drove you to choose cancer research?

**A:** My major in college was radiology, so things like X-ray, CT scans, MRI, and ultrasound. The program required me to have an internship during the last year. At that time, we were all working in a hospital and were required to do rotations in different departments. I made up my mind to go into cancer research when I went to work in radiotherapy. I saw cancer patients there, and they were suffering. I realized it would be great to do something to help them.

**Q:** How would you describe your experience in working with RUYES, and what are your hopes for those you mentor?

**A:** There is much effort put into the program to get our community involved. High school students and science teachers can come in and see what we are doing. I am hoping more people become interested in what we are working on and can share the experience, so others become interested in cancer research or careers related to the sciences. I think it is a valuable experience.

For more information on Hu Lab visit <https://www.cinj.org/WenweiHuLab>

## Q. Why did you want to be a mentor with RUYES?

**A:** It is important that knowledge is passed down. During my college years, I was guided by a mentor who was a PhD student who really showed me more about the scientific way and introduced me to a wet lab setting. I had been in two different lab settings prior to deciding I wanted to pursue research. Having a mentor really helped my experience. As a mentor now, I am hoping that I get to help people become more interested in research and improve different skills that will help them to logically solve problems in every aspect.





## RUYES Research Inspires Protocols and Learning

Maria Josefina Tolentino  
*Science Teacher at Woodbridge High School*

“With all the advances in technology, why still no cure for cancer?” This is a question many students have asked. Prior to participating in the Rutgers Youth Enjoy Science (RUYES) program, I would not have broached the question. Now armed with more knowledge about cancer, this experience inspired my pedagogical approach to topics I teach in chemistry and forensic science.

As an RUYES participant, my assignment was in the lab of Tracy G. Anthony, PhD, at Rutgers Cancer Institute of New Jersey which focuses on studying the body's responses to diet and environmental stressors to help prevent and treat diseases like cancer. Great thought went into designing this learning experience. The journal articles assigned (in sequence) provided the scaffolding necessary to understand the biochemical and physiological concepts while my peer mentor trained me to develop the skills required in performing the laboratory techniques.

I was the student, and it was a humbling experience! It was rewarding to be able to discover how the different concepts connect to each other, especially the feedback loops and interdependent mechanisms in the human body designed to promote homeostasis, even in the presence of stressors. This also allowed me to experience the common pitfalls that I see in my students - making harsh generalizations, oversimplifying concepts, and difficulty in accepting counter-intuitive ideas. The regular academic discourse with my mentor, built anticipation to discuss findings and for my mentor to correct misconceptions.

The regular academic discourse with my mentor, built anticipation to discuss findings and for my mentor to correct misconceptions.

A significant realization was that many concepts in chemistry, like the role of molecular structure (shape and polarity) in predicting function, equilibrium, kinetics, and stoichiometry, are all applied in these biological mechanisms. Because of this, I resolve to provide a wider breadth of examples in my lessons by covering more complex scenarios.

The Anthony Lab modeled effective use of physical resources also included in the Danielson Framework for Teaching Evaluation. My aim is to mirror how physical space and equipment are organized in the Anthony lab based on technique to streamline work in my classroom/lab. The use of visual cues and color-coding/labeling of instruments minimize contamination and maintain safety. Feedback from students indicates that lab days are very “stressful”. This anxiety can be alleviated by organizing workspaces and planning workflow carefully. Being submerged into innovative research settings exposed me to the process of how medical breakthroughs happen and the appreciation of how project-based learning (PBL), applied in the classroom, is a mini-version of how scientists engage in real-life research.

For more information on Dr. Anthony's research visit:  
<https://nutrition.rutgers.edu/faculty/tracy-anthony.html>



**“I was the student, and it was a humbling experience!”**  
-Maria Josefina Tolentino

# Acquiring Knowledge Through the Rutgers Youth Enjoy Science Program

Christabel Otoo

*Undergraduate at Rutgers University*

The Rutgers Youth Enjoy Science Program (RUYES) is a fascinating experience. Learning the basics and biological processes of cancer as a first research experience and being able to clarify misconceptions that many have is amazing.

Participation in the RUYES professional development introduces trainees to exceptional activities such as time management, coping with stress, cooperative skills, as well as continued introduction to the areas of cancer research. Engagement in research topics using a research database is another great practice taught for searching relevant sources. A highlight during professional development is when mentors in the program present their areas of research, and mentees can then ask questions about the presented information. This exposure broadens the fields of cancer study and career opportunities for RUYES participants. The presentations prove the significant impact of research, and its role in providing better care for patients.

**“... As a future doctor,  
...it is crucial to explore  
fields of research.”**

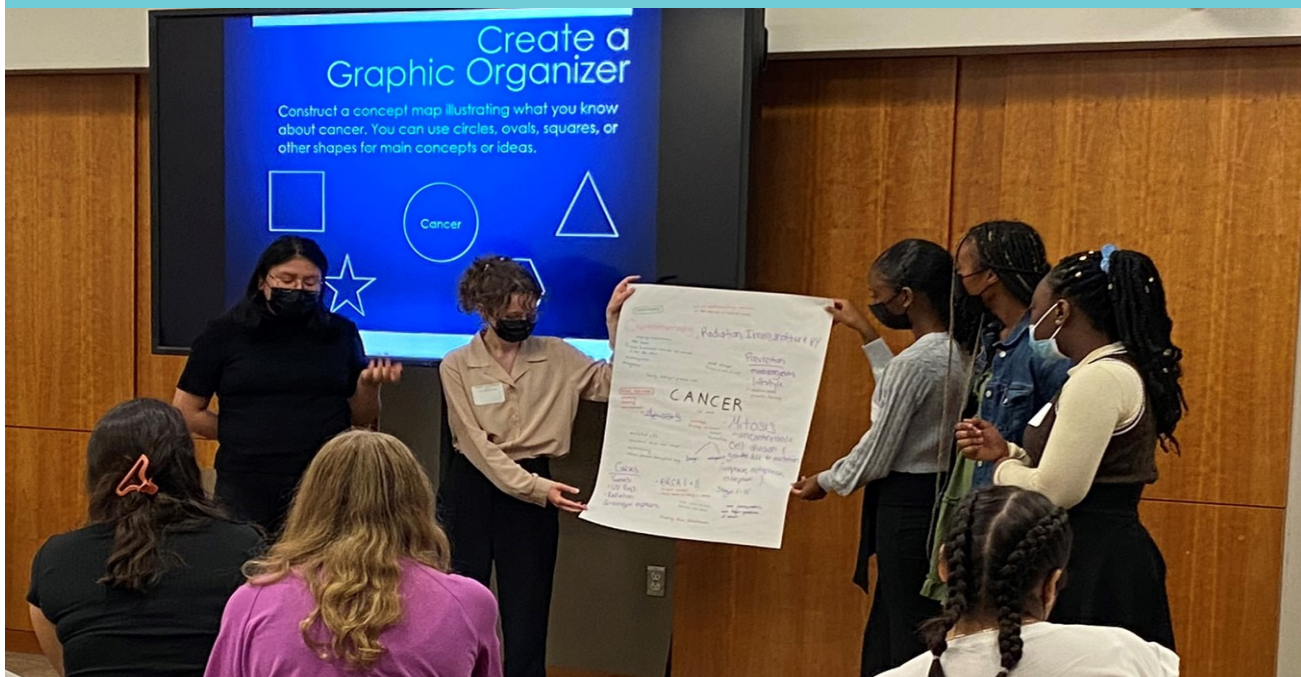
*-Christabel Otoo*

Additionally, trainees are involved in Rutgers Science Explorer Bus curriculum and activity development to educate middle school students about cancer. The construction process is an excellent collaborative and learning experience by which RUYES participants retain more information of the fundamentals of cancer and engaging critical thinking skills further.

Research involvement widens perspectives on cancer facts, figures, and statistical aspects, and there is introduction to definitions, scientific processes, and the types and stages of cancer. I, personally, gained knowledge of risk factors of breast cancer by analyzing environmental influences and adiposity change. The analysis of research papers brought to light racial disparities and discrimination towards African Americans due to their lack of access to proper healthcare and about breast cancer survivorship, particularly with African American women.

For future STEM professionals, it is crucial to explore fields of research, to continue to learn, and to make a positive impact within one's community.

RUYES students engaged in cancer curriculum Decoding Cancer featuring BioCONNECT: [www.decodingcancer.org](http://www.decodingcancer.org)





Rutgers Youth Enjoy Science (RUYES)  
and Oncology Physician Training Initiative to Maximize Diversity (OPTIM) Social Networking Event  
Giselle Jean-Marie  
*Student at Stuart Country Day School*

On Friday, July 8, the Rutgers Youth Enjoy Science (RUYES) Program held a networking event with the Oncology Physician Training Initiative to Maximize Diversity (OPTIM) Program. These programs are run through Rutgers Cancer Institute of New Jersey and seek to develop a sense of community, intellectual stimulation, and career opportunities for STEM focused students in high school, college, and beyond.

OPTIM, like RUYES, aims to provide medical students with cancer-focused research, as well as the opportunity to work directly with doctors in escorting them on their clinical rotations with patients in the areas of medical, radiation, and surgical oncology.

Part of the mission of OPTIM and RUYES, beyond lab research experience, is to give participants chances for career and professional development. These programs also provide networking opportunities with researchers, doctors, and faculty. OPTIM trainees provide mentorship to RUYES participants by providing information, advice, and guidance.



The RUYES program offers unique experiences along with opportunities to network, as did this event and meeting with OPTIM trainees. It was beneficial to hear firsthand from medical students. From a high schooler's perspective, the insight into undergraduate and graduate applications, difficulties, and tips, and the ability to make connections with people of various ages and education levels was invaluable.

Much was learned that evening, such as medical school is not impossible if time is managed wisely. Continuing with the RUYES program, opportunities to simply meet new, educationally like-minded people, such as those in OPTIM, is motivating when considering careers in STEM.



To learn more about both programs visit:

RUYES:  
[www.cinj.org/RUYES](http://www.cinj.org/RUYES)

OPTIM:  
[www.cinj.org/OPTIM](http://www.cinj.org/OPTIM)



# Rutgers Youth Enjoy Science Research Poster Symposium

Rosa Messina

*RUYES Program Coordinator*

In August 2022, the Rutgers Youth Enjoy Science (RUYES) Program concluded the summer research training with the first in-person Research Poster Symposium at Rutgers Cancer Institute of New Jersey. The symposium was held over two days, August 19 and 29.

High school science teachers, high school students, and undergraduate participants prepared a scientific poster and presentation describing the hands-on mentored cancer research they conducted at the Rutgers Cancer Institute during summer. Research projects included genomic instability, the role of p53 protein awareness, therapeutics, and survivorship. At the conclusion of their talk, attendees engaged participants in further discussion on their research or questions about their learning experiences in the RUYES program.

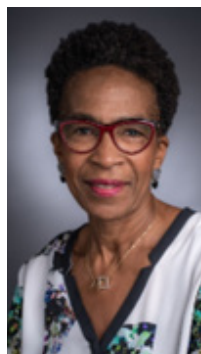
RUYES participants and cancer research were the highlights of this symposium. In addition, guest keynote speakers attended and offered motivational advice and commentary on the importance of science communication, building networks, and community outreach.



On August 19 (Day 1), Dr. Kamal Khan of the Office for Diversity and Academic Success in the Sciences (ODASIS), presented a talk entitled, “Don’t Give Up.” His stories were of notable individuals from underrepresented

backgrounds that overcame fear and adversity, academic struggles, and social obstacles to find success in the field of medicine. His comments on finding a support system, taking initiative, and advocating for oneself were relevant and motivating.

Keynote speaker on August 31 (Day 2), Karen Burns White of the Dana Farber Cancer Center offered an uplifting message as she began with “Congratulations. You have done what you were called to do.” She reminded the RUYES participants to continue to communicate with the network they have created, surround themselves with positivity, and to understand their mission. She also encouraged advocacy for oneself and others, as well as finding opportunities for community outreach.



In all, the event was a culmination of the summer experiences and research for the RUYES program participants and took on a celebratory air.

Tasha Hester, a cohort 2, first-year teacher in the RUYES program described her overall experience. “This program is a great support for teachers who want to increase the rigor and academic motivation in their classroom. It allows for a teacher to refresh or learn new skills and propel them into high level teaching.”



For more information on RUYES, visit: [www.cinj.org/RUYES](http://www.cinj.org/RUYES)

For more information on ODASIS, visit: [www.odasis.rutgers.edu](http://www.odasis.rutgers.edu)

For more information on the Dana-Farber Cancer Center visit: <https://hms.harvard.edu/affiliates/dana-farber-cancer-institute>