

# Undergraduate Research & Creative Activities (URECA)

<http://stonybrook.edu/ureca>

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## Ujunwa Cynthia Okoye

Pharmacology major, Class of '08; Howard Hughes Medical Institute (HHMI)  
Undergraduate Research & Minority Access to Research Careers (MARC) Programs

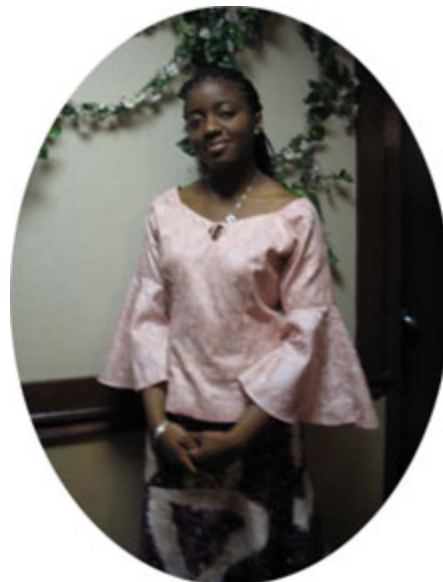
Research Mentor: Prof. Hsien-yu Wang  
Physiology & Biophysics

## Researcher of the Month - March 2007

### About Cynthia

Cynthia Okoye, a [pharmacology](#) major, has always known what she wanted to do, and Cynthia Okoye, a [pharmacology](#) major, has always known what she wanted to do, and was focused on a career in medicine from her early childhood years growing up in Nigeria, through her high school days where she studied at New Paltz High School, New York after moving to the U.S. in 10th grade. But her plans were altered by discovering another passion—a passion for research. In her sophomore year at Stony Brook University, Cynthia began inquiring about the research requirement for pharmacology majors, and soon after obtained a place in the lab of [Dr. Hsien-yu Wang](#) in the Department of [Physiology & Biophysics](#). She was awarded the [Howard Hughes Medical Institute](#) research fellowship in Summer 2006 for her project on "The Expression of WNT and Frizzled in Human Embryonic Stem Cells" and now has revised her life-long plans, and intends to pursue a joint M.D./ Ph.D once she graduates from Stony Brook. Of her transformative research experience in Dr. Wang's lab, she avows:

"Research has made the most contribution to being prepared for my future goals. Being able to get more involved in this now, I'm very happy about that. This way, I know, this is my life. This is what I'm going to be doing, this is it. *I don't ask, are you sure you want to do this? I know it. I am sure.* Also, research has helped me understand the importance of commitment and dedication. Prior to actually getting involved, all I knew about science was from the news, internet and laboratory courses, but now I'm very glad that I have this opportunity because not only have I grown, but I'm constantly learning new things. Everyday I learn something new and that's a very wonderful feeling. Even now that I've had some experience I still feel overwhelmed when I read publications by researchers and scientists, but I know that complete knowledge of the material can only be acquired over time."



This year, Cynthia was awarded a fellowship in LIGASE's [MARC](#) program and enjoys interacting with the MARC community of biomedical research students, faculty and staff. She also is active in [Minorities in Medicine](#), and the [Undergraduate Pharmacology Society](#) on-campus; is a member of Stony Brook's Collegiate Science and Technology Entry Program ([CSTEP](#)); and also enjoys artistic hobbies (particularly photography and charcoal drawing). Cynthia is openly grateful about all the great advisors and mentors she's had at Stony Brook: "Dr. Wang ([Physiology & Biophysics](#)), Dr. Cameron ([Pharmacology](#)), Rosemary Effiom (Prestigious External Fellowships, [Undergraduate Academic Affairs](#)), Judy Nimmo and Dr. Bynum ([LIGASE](#)). They've exposed me to different opportunities and provide me with advice which has also helped me make decisions about my future career choices."

One very exciting opportunity is coming her way this summer: Cynthia was accepted into the HHMI's national [Exceptional Research Opportunities Program \(EXROP\)](#) for summer 2007. She will be presenting her current research at the on-campus URECA [Celebration](#) (April 25th), as well as at the statewide [CSTEP Conference](#) at The Sagamore on Lake George (April 13-14). Below are some excerpts shared from her interview with Karen Kernan, [URECA](#) Director .

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## The Interview

### **Karen: How did you first get involved with research?**

*Cynthia:* I'm working with Dr. Wang. I started because of Dr. Cameron. I met with him. He told me that I have to do research to graduate, but that it's a good idea to start getting involved with research earlier, that I shouldn't wait to senior year to start looking for a research lab. The earlier, the better for you. I checked my email one day and Dr. Wang contacted me, said she'd heard about me from Dr. Cameron. He sent me your information, transcript, resume. And I'd like to meet with you. That was it. That's how I started! I'd already gone to her website. I knew about her research. But it was still intimidating just going there the first time.

We met at the start of spring semester, sophomore year. She gave me papers to read. Dr. Wang said, if we do this, we have to know you *want* to do this. She wanted me to really be sure that research was what I wanted to do. . . . By meeting with her a lot, and reading the papers, I had a better feel for research, a better understanding of most of what she was talking about. And then I got into the HHMI summer program, and began working full-time in the lab. By the end of the summer, I really had a much better appreciation for what she was doing. And I actually started my own project. Right now, we're working on human embryonic stem cells, mouse embryonic stem cells, and human bone marrow stem cells. We want to find out which Wnt and Frizzled genes are expressed in all 3 cells. We intend to quantify the data and determine how the presence or absence of a particular Wnt and/or Frizzled gene plays a factor in cell pluripotency or differentiation.

### **Getting that initial help sounds like it was a key factor, for you, in starting research.**

I don't know if I would have been that brave to start out by myself. I'm glad Dr. Cameron helped me out. You just have to find the right match, for you. I was lucky to find someone like Dr. Wang for a mentor.

### **When you first started in the lab, did you have any previous research experience? Did you start off completely from square one?**

Yes, I did because it was my first research experience. Dr. Wang drilled us with pipetting first of all. We would pipette water. Over and over and over again, for a whole week. With pipetting, you have to be efficient. You cannot make a mistake. In each protocol, you have this much amount of volume of each reagent. If you cannot get the accurate measurement, it's not effective. You cannot have your research data differing each time. So we worked with water a lot, pipetting the water, weighing it on the scale. We did that for a week. It was terrible at first. But now I'm very familiar with pipetting, and PCR...lots of techniques!

### **What have you learned from your mentor?**

She's a good mentor. She really understands and she helps you out whenever you need help. She also drills it into you that if you want to do research, she will help you, but you have to want to be helped. That kind of thing. You have to put in the effort. You have to be active to get something out of it. You have to be willing to put in the time, get your work done, and do it well. I think that because of Dr. Wang's personality, if you're working with her, you have to know what you're talking about and what you're doing. She's very thorough. She's also taught me to believe in myself, and work really hard. . . . work hard at attaining that which you really want. If you have a goal, don't be afraid to reach for it. Life isn't that easy always, I think. You have to really want something to get it. It's not going to come to you. I see how hard she works--she's always busy, working on grants. That's what it takes to be successful.

### **Did you get a different perspective from working with your other colleagues in the lab--the grad students, post docs?**

It's a small group. They're all very helpful. Dr. Mah and Yuan, they are both very nice and have assisted me several times when I have to leave early to catch class, and I've had to leave my samples running. The post docs in Dr. Malbo's lab are all very nice. They don't look down on you. . . . I also work with Annalisa, in Dr. Malbon's lab. She's a technician, and she helps me out especially with cell culturing. When I first started, she would watch over me as I performed Reverse Transcription or when I first made agarose gels. It's a friendly atmosphere, serious but friendly. And I love my lab. I would never even consider changing.

### **Would you say that research has enhanced your education, your understanding of your field?**

Yes, it has really helped me as far as determining exactly what I wanted to do. I always said I wanted to be in medicine. But when I started doing research, I was surprised to find I liked something else. My whole freshman year. I was so focused on medicine, medicine, medicine. I knew what I wanted to do. . . . I couldn't even really see myself doing something different. But now I've decided to get a MD/Ph.D. It will be a lot of years of school, and all of that, but it's the foundation I want. The foundation of going step by step, learning what the PhD students learn. I've never set my sights short. I'm always trying to achieve that higher thing, push myself farther. I always think, what else can I do? . . . I view the MD/Ph.D as a way to get the best of both worlds—medical experience plus a basic scientific foundation. My dream ambition is to one day hopefully run my own research group. I think that's the ultimate.

Research too has made the most contribution to being prepared for my future goals. Because for an MD/PhD, you have to be solid in research. At least up to a year's research experience. It's not just because I want to be a better candidate to apply to programs. But that background gives me that experience that I cannot get just going to classes. Being able to get more involved in this now, I'm very happy about that. This way, I know, this is my life. This is what I'm going to be doing, this is it. I don't ask, are you sure you want to do this? I know it. I am sure.

**Do you understand more how a scientist thinks?**

I understand my classes a lot better because of the research. I did better in the biochem lab because of it. You just understand it better.. at a different level. Yes, it's actually that. Research is like an extension of the Bio 202/ 203 labs. It is much more in depth. As you conduct your experience, you think beyond the present: what does the data mean? What is this going to result in? This data is not just there, it's broader than that, it's going to lead to something else. You understand it in a different sense.

**Do you have any advice to other students about getting involved in research?**

I think it's best to start out earlier than I did. I'm happy I started out when I did. But I think I should have started freshman year, or at least the summer of my freshman year. It's better to start early. You get exposed to a whole different world, not just classes, and you get exposed to something different. It helps you out in different ways. You can start developing that sense—that scientific mind, if you want to say..and it just helps your whole undergrad career. Even if you try it out and you see it's not what you want to do, it's best to get involved in the first place so you can say, "this is not what I want to do." There are so many research opportunities here. You just have to try to be open minded about research because you won't know how it'll turn out if you don't get a first hand experience.

**What are the best and worst days of research?**

I've had some really really bad times, and some really good times too. The best days are when you get data. Good or bad. . . at least you see something! That's the best. . . Sometimes after you do everything though, you have to start all over again, do everything again, start from scratch, figure out what went wrong.

**I understand you're going to be participating in a HHMI program off-campus this summer...congratulations!**

Thanks. I'm excited. And nervous. The research is different than what I'm doing. It's like I'm starting over—not in the sense that I have no background. But it'll be something completely different from what I do. But I think it will be a good experience, to be exposed to something different. Sometimes you're so involved in what you're doing, you don't think about other opportunities. I want to get a better feel for what's out there, and gain an understanding as to what my options are when I graduate. My mentor has been supportive about my getting involved, getting exposure to something different. But the fact that I'm going to be gone from the lab, taking time away from what I'm actually doing, it's bittersweet too.

**Were you always interested in science? or in medicine?**

When I was little, my mom always tells me, I always wanted to have a doctor's kit. I even tried to performed surgery on an ant. . . And with medicine, the idea of being able to help people and treat people has always been an important motivation. In my school in Nigeria, we had science labs but we didn't have that much hands-on experience for research because the resources were limited. The main exposure I had to science was at New Paltz High School. I think this was what first sparked my interest in science. I had just moved to this country in 10th grade and I was still getting used to the change and trying to adjust. Though I didn't decide then that I wanted to become a scientist, it created my curiosity. I took AP Bio. And I liked it. We had to dissect a cat. I was surprised how I actually liked it. You had to find the muscles, and name them. All that. I thought, wow, this is cool.. .My high school counselor was the one who told me about Stony Brook, and the pharmacology major. She told me about it, I read up on it, I looked it up and I applied for Pharmacology right from high school. When they called me and I found out I got in, I was really happy to get into the program.

**Do you have time for other things besides research and classes?**

I'm involved in [Minorities in Medicine](#), and the [Undergraduate Pharmacology Society](#). And the Academic Planning Committee. That was started last semester and we're working on getting academic programs out there. In January we had a game show that was both academic and fun. We plan to have two more in March. I also volunteer at the Hospital Blood Bank. And as far as my interests go, I'm interested in a lot of things. But I can't take classes for all of them. For photography, for example, I love taking pictures of flowers, hills, ants even. I haven't had the chance to take a photography course yet. I took an art course recently. And I liked it. I did a portrait of my dad for father's day. He loved it. I have my art kit and supplies, and when I feel like it, I dabble a little bit.

**Is it difficult to balance academics and research during the year?**

It's hard, but not impossible. Sometimes I think that the more work I have to do, the more organized I have to become to get through it. It's not always easy though. I have a set schedule that I try to stick to: I have research at this time, and go to class or volunteer at that time. But I'm always flexible with my time as well. My mentor, she allows that flexibility of time in the lab. You have to respect that and not take advantage of it. If I don't have a class today, or if class is cancelled, I try to go to lab. I try to go whenever I can. You're working with human living things. You cannot just say, I'm not going to come in today. You cannot whine about it, you can't complain, once you've made the choice that this is really what you want to do. You have to be willing to do everything to make it all work.