

# How Research Gives Hope: Dr. Susan Percival and the Power of Inspiration



*December 1, 1989.* Two months into her new position in the [Food Science and Human Nutrition Department](#) at the [University of Florida](#), Dr. Susan Percival receives a letter that will forever change her view on research. In this letter, the writer thanks Dr. Percival for sharing details about her research into [Wilson's disease](#), an inherited disorder of abnormal copper accumulation that had devastated the writer's family. Amid the struggle of illness, this writer wished Dr. Percival to know how much her research gave them hope.

“Before that letter, research was like cooking,” says Dr. Percival. “You follow a recipe for research, and at the end, you get information instead of a cake. I’ve always liked the discovery part of research. But to know that I could give hope through my research added an extra layer of meaning to my work.”

For the next three decades, Dr. Percival kept this letter as a reminder of how research can give hope. This memento inspired her throughout her career in research, teaching, leadership, and mentorship.

## First Glimpse of UF/FSHN Turns into a Successful Career

*April 1989.* Eight months pregnant, Dr. Percival meets the faculty at the University of Florida for her first interview for the new assistant professor in nutrition position while attending the Experimental Biology conference. She had just completed her postdoctoral associate position at [Texas A&M University](#) under the mentorship of [Dr. Edward Harris](#). A journey across states and time zones was not what the family-first new mom has in mind, but Dr. Percival is eager to learn more about her potential future home.

“I remember I was late to the meet and greet because I couldn't walk very fast at eight months pregnant!” Sue recalls, laughing.

In his reference letter, Dr. Harris praised the strength of Dr. Percival's research and teaching skills. Despite being thrown into her new research area of copper transport, Dr. Harris remembered how Dr. Percival excelled, publishing several impactful



*Dr. Percival in her first FSHN office.*



*Dr. Percival in 2018.*

articles and attaining a [National Institutes of Health \(NIH\)](#) fellowship during her two years as a postdoctoral associate. Dr. Harris attributed her high level of success to boundless curiosity matched by research skills honed through years of hard work.

By July, the UF/FSHN department had offered Dr. Percival the job, and Dr. Percival had accepted. “This position is a tremendous opportunity,” she wrote in her acceptance letter, “and you can be assured that I will do my best to enhance the successes of the program.”

She would go on to serve the department for nearly 35 years, helping to continue its international reputation as a high-quality research and teaching institution. During this time, the grateful letter she received a few months into her time at UF continued to encourage her.

### **Dr. Percival’s Research into Copper and Antioxidants Highlights Widespread Impact**

1994. Dr. Percival receives a letter from the referee of [Biological Trace Element Research](#), the journal of the International Association of Bioinorganic Scientists.

“This is an interesting, well-executed study,” the referee wrote. “I recommended it is published without revision.”

Attached to the letter is a yellow sticky note, a message written in Dr. Percival’s neat cursive: “This never happens!”

The acceptance of her paper, “[Manganese stimulates the oxidative burst of differentiated HL-60 cells](#),” without the need for revision highlights the groundbreaking research she frequently undertook during her career. As a postdoctoral associate, Dr. Percival researched the biological function of ceruloplasmin, a plasma copper protein hypothesized to transport copper into cells. She discovered a [temperature-dependent transfer of ceruloplasmin-bound copper](#) into the cytosol, pioneering this area of copper research.



*Dr. Percival celebrates her birthday in the FSHN Department.*

Dr. Percival continued researching copper after arriving at UF, investigating [abnormal copper homeostasis](#) in children with cystic fibrosis, [potential contributors](#) to copper deficiency, as well as [neutropenia](#) and [reduced immune function](#) resulting from copper deficiency.

“I would have continued studying copper for the rest of my days,” Dr. Percival says. “But NIH geared the copper funding towards something I was not prepared to do. I had to find funding to support my graduate students and, in the mid-1990s, the role of non-essential biological plant compounds was appearing in the literature. Copper played a role in antioxidant enzymes, so moving into plant phytochemicals and their antioxidant activity was not a huge leap.”

### **Revolutionizing Research into Plant Phytochemicals**

Early researchers studied the properties of plant phytochemicals by adding large amounts of plant extracts directly to cells in culture. Dr. Percival was at the forefront of the research that examined compounds that would be found after digestion. This research was the first to study plant phytochemicals in a physiological context, measuring what would be found in the blood rather than what was eaten.

In other words, Dr. Percival explains, “We studied the function of plant phytochemicals by analyzing the serum of the people who ate the phytochemicals before taking the blood sample, rather than studying their function straight from the plant.”

She published articles about echinacea, mushrooms, garlic, cranberry, green tea, and other compounds such as glutathione and ribose. Her research into the effects of [açai polyphenolics on human leukemia cells](#) and [red wine on Alzheimer’s disease](#) drew attention, yielding hundreds of citations. In 1993, she also worked on a USDA Study Section, highlighting the diversity of her talents.



*Early in her tenure as the FSHN Department Chair, Dr. Percival and other department chairs were treated to a tour of the beekeeping facilities on the UF campus.*



## Dr. Percival Coins a New Phrase: “Functional Bioavailability”

Dr. Percival recalls [her favorite paper on herbs and spices](#) with fondness. “We put herbs and spices into capsules for easy transport and ingestion. One hour after the volunteers swallowed the capsules, we took blood samples. If the herb or spice was absorbed into the bloodstream, then we should have found evidence of its function compared to placebo capsules.



*Dr. Percival with Rasha Mansouri, a former Ph.D. student in her lab who graduated in 2016.*

“We found different effects based on the specific herb or spice. For example, cinnamon derived from the bark of a tree is not very bioavailable, and we did not find many effects from eating cinnamon. We used three different measures of functionality, and it was from this work that I coined the phrase ‘functional bioavailability’. For a compound to be effective, it is not enough for it to be absorbed into the blood. It needs to get to a particular destination, and we know that it arrived based on the change in antioxidant activity in the blood, resulting in the protection of DNA from strand breaks or expression of inflammatory cytokine gene activity.”

Much of Dr. Percival’s work in functional bioavailability was aimed at affecting the function of the gamma delta T cell. As with her research on plant phytochemical properties, Dr. Percival’s experiments were aimed at understanding functional bioavailability in a more physiological context than previous studies.

To achieve this, her lab fed targeted compounds to volunteers, then took blood samples and incubated the volunteers’ white blood cells with their own serum. If the compound wasn’t absorbed and transported into the blood, the group saw no evidence of the compound’s functionality.



*Dr. Percival working in her lab.*

## Dr. Percival Expands into Patents and Popular Press

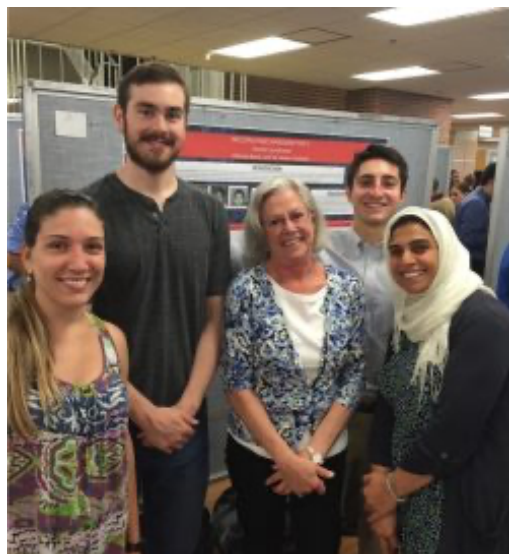
Dr. Percival's work was not confined to the laboratory. Throughout her career, she obtained two patents: one concerning the use of ribose for enhancing immune function and another regarding the use of high-oleic palm oil (HOPO). The utility patent for the ribose work was recognized in 2019 at the Annual FAES Research Awards Ceremony.

She also contributed her expertise in the popular press many times. A 2004 article for H Magazine reported the results of Dr. Percival's wine research, describing how compounds in red wine negate the immune system suppression that typically results from alcohol consumption. With each published paper and project, Dr. Percival established herself as an influential leader in her field.



*Dr. Percival working in her lab. Photo from the 2002 Annual Research Report for the Florida Agricultural Experiment Station at UF/IFAS.*

## Letters of Praise: Teaching, Advising, and the Superior Accomplishment Award



*Dr. Percival and members of her lab group at Stephen Svoboda's poster presentation. L to R: Camila Rodriguez (former Ph.D. student in Dr. Percival's lab, graduated in 2019), Brandon Eudy (former MS student in Dr. Percival's lab who graduated in 2020 and went on to earn a Ph.D. in the FSHN Department), Dr. Percival, Stephen, Rasha Mansouri.*

*Spring 2002.* The University of Florida [Superior Accomplishment Awards Program](#) gives Dr. Percival the [Superior Accomplishment Award in Faculty Service](#). As part of the nomination process, several faculty, staff, and students wrote letters detailing Dr. Percival's many accomplishments and contributions. These letters emphasize the dedication Dr. Percival gives to the success of the FSHN Department and its members, as well as the wider community.

As a teacher, she made an exceptional effort to ensure her students gained a thorough and engaging education. Her Advanced Human Nutrition classes were always popular, and despite high enrollment numbers, she made sure each student was engaged in the class.

She also opened her courses to students who needed to take them to graduate on schedule,

devoting extra time to making sure their experience was valuable. Student evaluations reflected high satisfaction from course attendees. In addition, she developed a nutritional immunology course and taught countless students in this course throughout her career, highlighting her initiative.



*Dr. Percival and Dr. Elaine Turner, Dean of the UF College of Agricultural and Life Sciences*

### **Dr. Percival Mentors Students and Faculty While Implementing Powerful Ideas**

Beyond teaching, Dr. Percival had a drive to make ideas a reality. In 2000, she recognized that nutraceuticals were gaining national attention. Along with [Dr. Elaine Turner](#), she developed and taught a course entitled Current Issues in Dietary Supplements. This course was taught both on-campus and as an online program, the latter of which helped many [Extension](#) students learn skills to educate consumers. The course soon led to an opportunity to co-author a chapter on the use of herbs in functional foods for the CRC Press Handbook of Nutraceuticals and Functional Foods.

In addition to teaching, Dr. Percival was actively involved in the academic, personal, and career development of students. She advised hundreds of undergraduate students, served as the Undergraduate Coordinator, and met with students on probation or suspension, spending as much time as necessary to help them develop plans of action to get back on track. For many years, she supervised undergraduate research projects and made sure each student had a rewarding experience.





*Undergraduate student Stephen Svoboda wins Outstanding Senior in Nutritional Sciences. Steven worked in Dr. Percival's lab as an undergraduate researcher, graduating in 2017. L to R: Student Services Manager Herschel Johnson, Stephen, Dr. Percival.*

Her mentorship didn't end with students. FSHN faculty also thrived under her care.

"I am so grateful to Dr. Percival for her mentorship, support, and leadership as our department chair," writes [Dr. Laura Acosta](#). "I joined the department in 2014 as a newbie to academia. Because my background was somewhat unconventional, I worried that I would have a hard time fitting in and finding my niche.

"But Dr. Percival welcomed me with open arms and gave me wings so my academic career could take flight. I will always remember how she would enthusiastically support my ideas and guide me toward opportunities for professional growth. When I look back over the past nine years, I realize that I owe so much of where I am today to Dr. Percival."

## **An NIH Honor: Dr. Percival Leads Inspirational Workshop on Immunonutrition**

*September 1, 2004.* Scientists have long recognized a connection between dietary habits and cancer processes. Yet when Dr. Percival embarked on her eight-month research sabbatical through the NIH, knowledge about specific dietary components' effects on tumor behavior eluded researchers. During her sabbatical, she worked with NIH's [Nutritional Science Research Group \(NSRG\)](#) to refine and expand their extramural research initiatives involving the role of bioactive food components in cancer prevention.



*Dr. Percival at a luncheon for the FSHN Department.*

"I found this experience to be richly rewarding," Dr. Percival wrote in her post-sabbatical report to the UF/FSHN Department. "It was inspirational to think I could have a positive impact on the national research agenda in the area of nutrition and cancer prevention."

In March 2005, near the end of her tenure with the NIH, Dr. Percival led a workshop entitled “Immunonutrition: Enhancing Tumoricidal Cell Activity.” Her work yielded research publications, a [book chapter](#), and material to ensure that immunonutrition was a priority area of interest within the NIH’s research agenda. Her research delved into the idea that nutritionally supporting cells that killed tumor cells, such as the gamma delta T cell, would help to prevent cancer. Many of the foods she studied boosted the ability of the gamma delta T cells to proliferate.

Soon after, she was elected Secretary of the [American Society for Nutrition](#) in 2010. Achieving this position was the icing on the cake for many years of service to the Society, including serving on award committees, research interest sections, and councils.



*Dr. Percival at an event held shortly after taking over as the FSHN Department Chair. The shirts were made by Janna Underhill, who is currently the Director of Advising at the UF Herbert Wertheim College of Engineering. Dr. Percival was referred to as "Queen of the Minions" for the day! L to R: Julie Barber (FSHN administrative support), Tish Adams-Waters (chemist who retired in 2023 after 36 years at UF), Dr. Percival.*

## **Stepping Up as FSHN Department Chair**

*July 12, 2013.* After a successful year as Interim Chair of the FSHN Department, Dr. Percival receives a letter offering her the position of Chair. Her eager acceptance of the position underscored her commitment to leading the department to even greater achievements.



“By the time I reached this stage in my career, I had served under many chairs at UF and other institutions,” she recalls. “I based my mentorship style on the attributes I liked in all these other great leaders.”



*The FSHN Pilot Plant after renovations.*

Over the next ten years, Dr. Percival continued championing the department’s teaching mission while supporting students, faculty, and staff. Her efforts helped recruit faculty and increase the total value of grants awarded to the department. In addition, Dr. Percival’s initiative encouraged increased participation in activities such as the FFA, [Florida Youth Institute](#), and [TailGATOR](#). She spearheaded the department’s relationship with [Taste of Immokalee](#), a student-created and -operated business teaching social entrepreneurship skills in

one of the poorest counties in Florida. The Taste X UF collaboration resulted in the [second annual experiential program](#) for Taste of Immokalee students this past summer.

Overall, Dr. Percival remembers her time as the department chair with fondness. “I had great support from administration and faculty to improve the facilities. For example, I kept a 1996 memo from a food science faculty member about the deplorable state of the [FSHN Pilot Plant](#). We had little pride in the facility and therefore were not motivated to maintain it. I’m happy to say that now we can be proud of the Pilot Plant facility.”

### **Upgrading the Pilot Plant Leads to Department Pride**

Some of the modifications made to the facility include creating the experimental food lab with eight units for teaching. In addition, all the cold rooms were replaced or repaired and on monitors. The floors were redone, the light ballasts were changed, and energy-saving LED bulbs were put in. Much of the small equipment was replaced, including a fryer, drying ovens, balances, and the muffle furnace. Dr. Percival also organized the donation of a pasta extruder.



*The FSHN Pilot Plant was well-organized after the renovations.*

Other improvements improved the teaching environment. By alleviating traffic to the ice machine, Dr. Percival created space for teaching and research. The department also improved the steam facilities and other important teaching equipment, such as replacing three autoclaves and upgrading the third-floor teaching lab equipment.

In reviewing her work, members of the department lauded Dr. Percival for her active support of faculty research, promotion of all students' successes, and commitment to addressing feedback. Her dedication to project flexibility and outreach helped department members engage in fulfilling work with real-world impact.

Student Services Manager [Herschel Johnson](#) describes her support, writing, "In her time with the FSHN Department, Dr. Percival was a dedicated educator driven to create a team of professionals that would push the department forward. Her witty humor and driven objectives promoted a fun work environment with a focus on providing the best service possible. Her support of staff and compassion for everyone was unmatched. It was great to work for a supervisor who had clear directives and provided motivation to meet objectives while promoting autonomy in the work environment and supporting creativity. She will be missed!"



*Dr. Percival enjoys an FSHN Department Christmas party in 2012 with her daughter, Melanie, and her grandsons, Jason (L) and Orion.*

## Identity and the Power of Inspiration

August 17, 2023. “Who am I?”

On her last day as FSHN Department Chair, Dr. Percival reflected on her distinguished career. “Am I a teacher? A scholar? A mentor? A leader?”

In reviewing her career accomplishments, we see that she embodies all these roles. Even in retirement, Dr. Percival continues to encourage students, faculty, staff, and alumni. She has never forgotten the power of a conversation, phone call—or a letter from a grateful friend—to inspire someone in their career and life. Her legacy is far-reaching and long-lasting, and she deserves thanks for her many years of service to the UF/FSHN Department and the nutritional sciences profession.



Dr. Percival and her son, William.



Dr. Percival's furry friends, Molly (L) and Shadow.

“I feel pretty lucky to have been able to do what I did throughout my career, and I feel pretty happy with what I was able to accomplish,” Dr. Percival says, looking to the future. “If I had an impact on people, it was because they took advice and ran with it, becoming successes in their own right. My hope now is to have a creative and active life with my dogs, my friends, and my family. Thank you to everyone who has inspired me throughout my career.”

To Dr. Percival: Thank you for everything you have done for the FSHN Department, nutrition research, and each life you have touched. We wish you the very best as you embark on this exciting new phase of your journey.

By Jessie Erwin  
Originally [published](#) on the [UF Food Science and Human Nutrition](#) website on March 18, 2024.



Dr. Percival holds the nameplate she received after becoming the FSHN Department Chair.