

## INNOVATORS &amp; IDEAS: RESEARCH LEADER

# Edythe London: Translating knowledge from molecular and functional imaging studies to new pharmacological and brain stimulation treatments for addiction

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**Edythe London, Ph.D., is a distinguished professor-in-residence in the Departments of Psychiatry and Pharmacology at the University of California, Los Angeles (UCLA), where she holds the Thomas P. and Katherine K. Pike Chair in Addiction Studies. She chaired (2010–2014) and later co-chaired (2015–2022) UCLA’s Integrative Center for Addictions (2010–2014). Before coming to UCLA, she was acting chief of the Neuroscience Branch and Chief of the Neuropharmacology Laboratory in the Intramural Research Program of the National Institute on Drug Abuse, USA. There, she established and was the Director of NIDA’s Brain Imaging Research Center (1992–1999). In her engagement with the Genomic Press Interview, Professor London offered insights into her life and distinguished career, enriching the series with her unique perspectives.**

**The Genomic Press Interview Part 1: Edythe London – Life and career**  
**Could you give us a glimpse into your personal history, emphasizing the pivotal moments that first kindled your passion for science?**

I grew up in the 1950s and 1960s—the time of the post-World War II Cold War, when the United States and their respective allies were competing with Russia, and when science and technology were emphasized. As part of an immigrant family, I was patriotic, and this zeitgeist affected me. The launch of Sputnik, when I was a child, gave me the sense that science can open the universe and change the world. I was hooked on the idea that a career in science would be an exciting and rewarding path. When I went to college, I took advantage of an educational opportunity grant provided by the National Defense Act, which provided for scholarships and loans for students of mathematics, science, and engineering.

**We would like to know more about your career trajectory leading up to your most relevant leadership role. What defining moments channeled you toward that leadership responsibility?**

My postdoctoral fellowship, in the Division of Psychopharmacology at the Johns Hopkins School of Medicine, was a transformative experience. The division was small and was created to recognize a new field. Led by Solomon Snyder, the faculty were young and were creatively exploiting new techniques, such as receptor pharmacology and autoradiography, which ultimately had a major impact on drug development and therapeutic regimen design. I did one of the first characterizations of a glutamate receptor, the kainate receptor, and worked among other trainees who became leaders in the pharmacology industry.

At that time, positron emission tomography (PET) was being developed for noninvasive molecular imaging of the brain. The first PET scanner came to the National Institutes of Health (NIH), when I moved there from Johns Hopkins, and I was able to use this new technology in human studies. I saw the value of mapping brain function in studies of drug action and addiction.



**Figure 1.** Edythe London, PhD, University of California, Los Angeles (UCLA), USA.

Shortly thereafter, the cocaine/crack epidemic led to an award from the Office of National Drug Control Policy, which funded my proposal to build the Brain Imaging Center in the Intramural Research Program of the National Institute on Drug Abuse. This support allowed me to do some fundamental studies of human drug addiction. My laboratory developed new probes for molecular neuroimaging in humans and mapped the brain circuitry that supports defining features of drug addiction, such as craving.

**Please share with us what initially piqued your interest in your favorite area of research or professional focus.**

When I started my doctoral training in pharmacology at the University of Maryland, my intention was to study drug metabolism, a research area that was emphasized in pharmacology at that time. I completely changed direction because of recent developments in pharmacology. These included the Nobel Prize award-winning work of Julius Axelrod, my scientific grandfather, on the release, storage, and reuptake of epinephrine and norepinephrine; and the discovery of the opiate receptor by Candace Pert in Solomon Snyder’s laboratory at John Hopkins. Learning more about how neurotransmitters affect behavior became a career-long passion.

**What kind of impact do you hope to achieve in your field through your focus on your specific research topics?**

I hope to advance our understanding of the brain circuits that promote and maintain addiction, providing knowledge to develop more effective treatments. With over 100,000 overdose deaths in a year due to drug overdose and accidental poisoning, reducing addiction by guiding the development of more effective treatments is an important mission.

**Could you tell us more about your current scholarly focal points within your chosen field of science?**

I am focusing on clarifying the neural vulnerabilities to addiction, with an eye toward using the knowledge gained to develop treatments using targeted brain stimulation as well as medications. We now have publicly available data on brain function and genomics of children before they experiment with drugs and ultimately become addicted. At this time, noninvasive brain stimulation techniques are being developed to alter pathological features of brain circuitry. I am especially interested in translating knowledge from molecular and functional imaging studies to the design and conduct of clinical trials for addiction using medications and targeted brain stimulation.

**What habits and values did you develop during your academic studies or subsequent postdoctoral experiences that you uphold within your own research environment?**

I have learned to focus on problems that have potentially high impact—those that are not only of interest to me, but that can influence how research is conducted with relevance to clinical practice. I also have learned that science flourishes in an environment of collegiality and sharing. I try to engrain these principles in my trainees.

**At Genomic Press, we prioritize fostering research endeavors based solely on their inherent merit, uninfluenced by geography or the researchers' personal or demographic traits. Are there particular cultural facets within the scientific community that warrant transformative scrutiny, or is there a cause within science that deeply stirs your passions?**

Science has opened up to women over the course of my career. Despite some persistent inequities, women are coming into the field and are taking leadership positions. Yet, we still face the challenge of increasing representation by racially minoritized groups in the scientific community. Although our professional societies and academic institutions have developed attitudes and programs that bring members of these groups into science, it is not enough to be included, but we need to change the culture of science to make them comfortable and to have "a seat at the table."

**What do you most enjoy in your capacity as an academic or research leader?**

My greatest pleasure in my professional life is seeing the development and success of my trainees. Another source of great satisfaction is seeing that my work has an impact on how research in my field is done.

**Outside professional confines, how do you prefer to allocate your leisure moments, or conversely, in what manner would you envision spending these moments given a choice?**

My priority is family. I love to travel with my husband and to spend time with my children and grandchildren.

**The Genomic Press Interview Part 2: Edythe London – Selected questions from the Proust Questionnaire<sup>1</sup>****What is your idea of perfect happiness?**

Perfect happiness for me would be the satisfaction that I have given my best to my family and have done something that made a difference.

**Which living person do you most admire?**

I have great admiration for Jennifer Doudna.

**What is your greatest extravagance?**

One might consider my investment in personal training an extravagance. I see it as something to give me a healthy break from my academic endeavors.

**What are you most proud of?**

I am most proud of helping younger people develop their careers, serving as a role model, and encouraging them.

**What is the quality you most admire in people?**

Generosity.

**What do you consider the most underrated virtue?**

Raw talent is underrated. Without dedication and resilience, it does not lead to success.

**What is your favorite intellectual activity?**

Developing a new project: I see it as an art form to package a new idea for presentation and to think through the technical issues of making it work.

**Where would you most like to live?**

I would most like to live wherever I can work on something exciting and be near family. I am a city person, so that place ideally is a bustling metropolis.

**What is your most treasured possession?**

My collection of family photos.

**When and where were you happiest? And why were so happy then?**

Of all the times of my life, I am happiest now. I have survived the uncertainty and stress of building a career, and no longer face the antifemale discrimination I saw as a young scientist. I enjoy the collaboration and friendship and even have some recognition from valued colleagues. On a personal level, it is a joy to see my children successful and happy, and to be in a loving marriage.

**What is your most marked characteristic?**

I think the characteristic that most led to my success is resilience.

**Among your talents, which one gives you a competitive edge?**

My ability to view the bigger picture in selecting a research direction has given me an extra edge.

**What do you consider your greatest achievement?**

I came far in life from where I started. I was born in a refugee camp after the WWII, and my parents struggled as immigrants. Building a rewarding career in science against those odds and in an environment that was unfriendly to women scientists was an important achievement. I am grateful and proud of it.

**If you could change one thing about yourself, what would it be?**

I would be even more self-confident.

**What do you most value in your friends?**

Loyalty.

<sup>1</sup>In the late 19th century various questionnaires were a popular diversion designed to discover new things about old friends. What is now known as the 35-question Proust Questionnaire became famous after Marcel Proust's answers to these questions were found and published posthumously. Proust answered the questions twice, at ages 14 and 20. Multiple other historical and contemporary figures have answered the Proust Questionnaire, such as Oscar Wilde, Karl Marx, Arthur Conan Doyle, Stéphane Mallarmé, Paul Cézanne, Martin Boucher, Hugh Jackman, David Bowie, and Zendaya. The Proust Questionnaire is often used to interview celebrities: the idea is that by answering these questions an individual will reveal his or her true nature. We have condensed the Proust Questionnaire by reducing the number of questions and slightly rewording some. These curated questions provide insights into the individual's inner world, ranging from notions of happiness and fear to aspirations and inspirations.



**Who are your favorite writers?**

Siddhartha Mukherjee and Abraham Verghese.

**Who is your hero of fiction?**

Elizabeth Bennett from *Pride and Prejudice*: I admire her intelligence, courage, and recognition of the importance of love.

**Who are your heroes in real life?**

The firemen who ran in to save people at the Twin Towers of the World Trade Center on 9-11.

**What aphorism or motto best encapsulates your life philosophy?**

I believe that we are on earth to be kind to one another and to make the world a better place. This view guides my life in the laboratory and in my personal life.

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