



Impact Statement

Paige Frei, Grade 11

Pioneer of Understanding the Complex Cognitive Brain, 2026

Colored pencil, graphite, charcoal, pastel on paper, 23 x 18 inches

Saint Joseph Academy, Cleveland, OH

Unsung Hero: Dr. Patricia Goldman-Rakic

Patricia Goldman-Rakic was an incredibly smart and talented woman who was a pioneer in her field of neurobiology and neuroscience research. Not only did she contribute significantly to the scientific community, but her works and efforts have inspired and encouraged other women to pursue research and science and any field they have passion in. She not only made critical advancements in our understanding of the brain, specifically the prefrontal cortex, through ways that were previously thought nearly impossible; she was a prominent writer who wrote over 300 scientific articles over her career and co-founded the Cerebral Cortex, a scientific journal that documented her research. Rakic's discoveries gave the scientific community the ability to understand basic functions of the brain we now think are common sense. Rakic discovered how to map out the prefrontal cortex and was able to use the information to further study how our working memory works and how dopamine plays an important role in our brain's functioning. However, her research not only helped pioneer advancements in understanding basic functions of a healthy brain. Her work helped make progress in our understanding of how disorders like schizophrenia, Alzheimer's, and ADHD work and what happens in the brain that results in their symptoms, as well as ways to improve medications and ways to treat the disorders.

Patricia Goldman-Rakic not only made discoveries that have greatly benefited millions of lives, but she made these discoveries at a time where they were thought to be impossible and as a woman in a predominantly male field. She overcame the worries she had about not being able to succeed because of her passion and drive to not only do what women in her time were thought incapable of doing, but what everyone thought to be unachievable. She is an inspiration to not only women in science, but to anyone who has experienced doubts about their own capabilities. Rakic's story shows us that when we are guided by our passions, no matter how big or small, we will be able to overcome the obstacles we'll face and do great things.

As a young girl who not only has a passion for health science, but also for writing, research and service for others, Patricia Goldman-Rakic's life and journey really resonate with me when I think about what I want to pursue in my career. I find her work to be very inspiring and encouraging for several reasons. Of course, her research resulted in new discoveries about the human brain, which is a constant battle that makes any discovery amazing, but I think many people may overlook the importance of exactly what she discovered. Even though she wasn't performing surgeries on patients or creating medicines to treat brain disorders, her research and work paved the way for others to find those solutions. The work behind the scenes that we don't hear a lot about that created the opportunity for new medications and treatments is just as

important and crucial to helping others as the treatments themselves. Rakic's story reminds me that even if I'm not out there performing miraculous surgeries, I can still make a difference and help others through science and medicine in meaningful ways like researching and writing.

When I first decided on making a piece to honor Patricia Goldman-Rakic, I began reading through her research to better understand what she did. As a student who already has an interest in learning about the brain, it was incredibly interesting to not only learn about the impact of her work, but the process and results of her work. Rakic's research on the prefrontal cortex and role of dopamine in working memory had been thought to be impossible to ever discover, however she persisted and as a result we now have not only her research, but her many papers written to share her knowledge with others. I knew I wanted to include depictions of her working in the lab, her writing and research papers, and her work with the brain itself. I also wanted a portrait of Rakic to be the center of attention in the piece, and I chose a photo of her where she appeared not only happy, but content. To me, it seems as if she's looking off into the distance, which I think is a great way to represent how all her work has contributed to our understanding of the brain and is used long into the future to continue to help and inspire others.

Her portrait is in black and white while the background is in color as a way to show that even though to us, she lived and did her work a long time ago, her actual experiments, research, discoveries, and impact will forever be relevant and useful no matter what time in history it is. Around her portrait are papers to represent her writing that shared her research with the rest of the world. There's a depiction of Rakic using a microscope to represent not only her role in research, but her time spent in the lab as a woman in a time where women were not treated equally in academic and medical settings. Behind her portrait and across the entire piece, there's a brain that "breaks down" into neurons to represent the purpose of all her research, to better understand the human brain and all its complexities.

Patricia Goldman-Rakic's story inspires me to believe in my own capabilities as a young girl hoping to succeed in the medical field. Throughout working on this project I've reflected on how despite not knowing what I want to pursue specifically as a career, there are always ways I can help others even if I'm not directly interacting with them. Moving forward I hope to take her story with me and use it as a reminder that I can do hard things if I truly put my mind to it and make a positive impact on other's lives in small and big ways.