

## An Evening at the Lab at the End of the Chromosome

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Professor Karen Kirk training Sylwia Dakowicz '13 in her lab.

In 2009, five out of the thirteen announced Nobel laureates were women (Weissman, 2010). Since the award has been given, only 5% of the laureates in Physiology or Medicine have been women (<http://nobelprize.org>). Dr. Elizabeth Blackburn, received the Nobel Prize for discovering the enzyme telomerase, and the molecular behavior of telomeres, which are the protective caps at the end of eukaryotic chromosomes. This made her the 9th female laureate to be announced in the field of Physiology or Medicine (<http://nobelprize.org>).

In the summer of 2010, the lab that studied telomeres and telomerase properties at Lake Forest College also employed five enthusiastic undergraduate researchers, all of which were women. Professor Karen Kirk, who trained this team, was once a post doctorate fellow in Elizabeth Blackburn's lab. The Kirk lab is located on the end of the chain of labs in the Dixon wing of the second floor when coming from the main entrance of Johnson Science Building. The naming of this room J-235, "The lab at the end of the Chromosome" not only brings out its location, but also its member's main research interest.

During the Friday evening I spent with them, Professor Kirk led me to her lab, where I got the opportunity to learn more about their work. As mentioned earlier, telomeres are repetitive DNA sequences found at the end of the chromosome that shorten each time a cell replicates. They are also one of the factors that determine when a cell undergoes cell death. Some germ cells have longer telomeres than somatic cells, which makes them more interesting to study because that is what is inherited. Therefore, The Kirk lab crew focuses on studying the telomere length of germ cells of a filamentous fungus called *Aspergillus nidulans*. Telomeres and the enzyme telomerase are found to be important in the maintenance of human cancer cells, making telomeres a much needed and appealing area of study.

Professor Kirk received her bachelor's degree in chemistry, from the University of Delaware, and her PhD in Molecular Genetics, from Rutgers University. She headed to University of California, San Francisco to join Elizabeth Blackburn, where she was influenced to focus on the area of research she is currently doing. "Why [teach at] small Liberal arts colleges like Lake Forest" I asked her. "I never liked teaching setup at larger universities" was her answer. "I rather prefer one-on-one basis teaching[rather] than lecturing to a larger group" she added.

According to Professor Kirk, there are many more rewards from training undergraduates than graduates. She recalls, "I started seeing the bigger picture after I started training undergraduates. I was no longer limited to a small area of focus. Undergraduates are always inquiring and come up with new ideas." Professor Kirk sees the creativity of the students as the strength that leads her lab toward success, for which she offered many examples. For instance, before the Kirk lab group started working with *Aspergillus*, they worked with *Tetrahymena*, a single cell pond dweller. One of the reagents that they used on *Tetrahymena* was a suggestion of Marina Petcherskaia ('00). Professor Kirk claims, "I would have never thought of trying some new things if it was not for some [of my] undergraduates". The Kirk lab was also the first lab team to develop a PCR assay, a method to measure extremely short telomeres with a small amount of DNA. Professor Kirk remembers Julie Wang ('09) as the undergraduate who suggested a new method of grinding up *Aspergillus nidulans* using the Fast Prep method. Professor Kirk pointed out the new homogenizer that her lab has purchased to grind up the *Aspergillus*, sounding like a mother who takes pride in her children's success.

Research is not all about new discoveries; it is about perseverance throughout the process of science. If you are expecting success overnight, research might not be for you. Professor Kirk puts her idea into words, "It's more rewarding to wash dishes than to do research for people who need short-term reward." The path of research can be different and thorny. At first, some ideas might sound peculiar, but having the courage to try something new and learn from mistakes is the most vital skill to practice. Saajidha Rizvydeen '12 agrees with professor Kirk saying, "Sometimes, it is better to get good results only once in a while. It makes us to sit down and think twice about what we need to improve on."

Dr. Blackburn, professor Kirk's mentor, enjoys training women scientists, a trait that she has passed onto her mentee. Professor Kirk is an empowering figure to many of the undergraduates who work in her lab, as it has given rise to many talented young scientists.. Dr. Elizabeth Blackburn is also a significant influence in her scientific career. Professor Kirk has her office adjacent to the lab, evidence that shows how much she enjoys motivating undergraduates in science. Professor Houde, the Chair of the Biology Department, strengthened my observation. She says "From my office, I often hear lots of hilarity, but I know it leads to valuable research results. Karen Kirk knows how to do leadership with laughter".

Professor Kirk knew that she wanted to do research under the guidance of a woman. Her passion toward training women scientists developed when she was a post doctorate in the Blackburn Lab. However, it was first ignited after she was denied access to a calculus class at aboy's school, because calculus was not offered at her girl's high school. That could never stop her from taking calculus

at college, where there were only two women in a class of thirty chemistry majors. Professor Kirk continued, "I have always felt like a minority at most of the national conferences except at the Cold Spring Harbor Laboratory meetings, where there are many strong women scientists."

"Times have changed; there are more women scientists now than many years ago", Professor Kirk mentioned. There are not just systemic difficulties but also gender specific obstacles that a woman has to face in the field of science. Dr. Kirk divides her valuable time between her career and personal life efficiently, being a paradigm to any woman who wants to pursue a career in science.

Finally, before I left the lab at the end of the chromosome, I had one last question for Professor Kirk. I asked what her favorite moment was at Lake Forest College. To Professor Kirk, a lab outing to eat ice cream with her mentees has always been special. The picture with her all-female lab crew enjoying their ice cream taped on the front door was evident of that. While the three female undergraduates and professor Kirk worked on the article they will soon publish, I bade my farewell to the telomere crew.

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#### **References**

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