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Marina Triplett

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To what lengths is a scientist willing to go to become successful? For anyone who has ever had experience with scientific research, it becomes evident that science is a commitment that requires a novel approach to problem solving, long hours in the lab, and some amount of good fortune. However, these factors alone do not guarantee that a scientist's research will "make it" in the competitive environment of academia. In the dog-eat-dog world of science, time is key. Today's scientists must acquire funding, perform the necessary experiments, and publish their work before their competitors, lest their careers perish. This concept is not necessarily novel. History has shown that the first to publish receives the recognition—it's the same reason why Charles Darwin is a household name and Alfred Russell Wallace has been overshadowed, despite both developing similar theories of evolution around the same time. To succeed in science, a scientist must be both competitive and willing to make his or her research a priority.

One film that successfully depicts the competitive nature of scientific research and the sacrifices that scientists make for their careers is *Life Story: The Race for the Double Helix*, a 1987 made-for-television film that dramatizes the discovery of the structure of DNA by the legendary duo James Watson and Francis Crick in 1953. The film stars Jeff Goldblum as Watson and Tim Pigott-Smith as Crick, who are working at Cambridge to understand the structure of DNA before their competitors, Maurice Wilkins (Alan Howard) and Rosalind Franklin (Juliet Stevenson) of Kings College London, can determine the structure themselves. The film won a BAFTA TV Award in 1988 for Best Single Drama.

The opening scene introduces James Watson, a young and ambitious molecular biologist working as a postdoctoral fellow in Copenhagen. He dreams of fame and recognition, and he believes that DNA is his ticket to scientific notoriety. After accepting a research position at Cambridge, Watson is introduced to Francis Crick, a graduate student working on a hemoglobin project who would rather be working on DNA. The two connect immediately when Crick states that

he believes that the genetic code is contained in DNA, not protein—a theory with which Watson also staunchly agrees. The two decide to team up to create a three-dimensional model of DNA, which they believe must have some type of helical structure. Meanwhile, X-ray crystallographer Rosalind Franklin is hard at work producing X-ray diffraction images of A form and B form DNA, but faces difficulty in being taken seriously as a scientist by her male colleagues, including Maurice Wilkins, whom she fears is trying to take credit for her work. Franklin eventually decides to quit and continue her work on the A form of DNA, while ruefully conceding to having Wilkins work on the B form. Wilkins, realizing that the B form image may be the key to unlocking the helical structure of DNA, decides to show Watson and Crick the image generated by Franklin. The pair have a "Eureka" moment upon seeing this image, realizing that DNA must have a double helical structure. The two construct an accurate representation of the structure of DNA—and the rest is history. Watson, Crick, and Wilkins are awarded the 1962 Nobel Prize in Physiology or Medicine. However, Rosalind Franklin dies of ovarian cancer before the award is given and is not recognized, as the rules of the Nobel Committee state that an award cannot be given posthumously.

One of the primary themes of the film is the competitive nature of science as a profession and how competition can raise questions about ethics in scientific research. Throughout the film, Watson and Crick work feverishly to construct their model of DNA, as they know that there are other scientists around the world who are working towards the same goal. When Nobel laureate Linus Pauling releases a paper regarding the structure of DNA, Watson and Crick fear that their dreams of recognition and fame are over. However, they are relieved when they realize that Pauling's structure is incorrect and that they still have time to work on their model. The competition between Watson and Crick and Linus Pauling portrayed in the film calls into question the motives of scientists. Is the main goal, as a scientist, to make a scientific discovery in order to contribute to a body of knowledge, or do scientists work simply for the prospect of recognition, accolades, and acclaim? Although the answer probably varies from scientist to scientist, there is no denying that scientists dedicate their lives to their work because they truly believe that their work is worthwhile. The film also depicts competition between Watson and Crick and Wilkins and Franklin, as the pairs are working on similar research at different universities. There is also rivalry between Wilkins and Franklin once Wilkins realizes that Franklin's X-ray diffraction images could be of importance; he fears that she alone will be given credit for her work, even though he was under the impression that they were working collaboratively. The film calls into question the theme of scientific integrity. There can often be gray areas with respect to crediting others for their work, and it is necessary for scientists to give credit to whom credit is due. At what point does "referencing" another scientist's work transition into "stealing" another person's work? It has been argued for years that Rosalind Franklin did not receive the credit she deserved for her X-ray diffraction images and that Watson, Crick, and Wilkins used her work without her permission. Although we can never be certain what actually took place, it is important for scientists and their collaborators to be clear on the rules of ethical conduct with regards to the publication of their research.

The film also serves as a commentary on the lonely life of a scientist, an idea emphasized by both Franklin and the male characters of the movie. Throughout the course of the film, Watson is constantly searching for a girl, but is reminded by Crick that he still "has time" for such matters later and should focus more on his work. When asked by a friend if she has ever wanted to get married, Franklin rejects the idea, stating that she would "rather do one thing well than two things badly." This attitude is one on which many women in science still agree. There is no denying that as a scientist, one must occasionally make sacrifices when it comes to leisure time or family time if he or she wants to be successful and productive in the lab. Many believe that splitting time between science and family is impossible if one does not want either or both to suffer. Science typically requires long or irregular hours in lab, which can often make married life or family life challenging. How can one expect to have time for a family while still being able to dedicate time to a truly successful research career in the competitive field of science? Although women arguably have more trouble with this issue, it can still be difficult for both male and female scientists to find a successful work-life balance. Like in daily lab work, time management is key to achieving this balance.

Overall, *Race for the Double Helix* gives a fairly accurate depiction of the professional and personal struggles of a scientist. A scientist must be both ambitious and ethical and be hardworking while also not allowing the work to consume his or her entire life. While these contradictions may seem to leave scientists at an impasse, the important thing to remember is that above all, successful scientists generally have a passion for research. A career in research may require a monumental amount of dedication, but many scientists are readily willing to make this compromise because they cannot imagine themselves doing anything else. Sometimes it is the potential for scientific discovery, the vast number of modern problems not yet answered by science, or the competitive atmosphere of academia that pushes inquisitive and ambitious individuals into the fields of science, regardless of the difficult research career that may follow.

References

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