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A Letter to Dr. Koch

Farahnaz Movahedzadeh[1, 2]* and Maxwell Rutter[1, 2]

[1]*Department of Biological sciences, Harold Washington College, Chicago, IL 60601, USA*
[2]*Institute for Tuberculosis Research, University of Illinois at Chicago, Chicago, IL 60612, USA*

As a microbiologist who has spent many years working in the TB research field, I am passionate about using this complex microorganism as a model in teaching my biology and microbiology classes. When students ask me why I chose this field, I tell them that about 18 years ago I was looking for a challenging research project and discovered the mycobacteria. When I started down this challenging path, there was no DNA sequence, new drugs or vaccines. Many years have passed and although we now have the entire DNA sequence of TB, there are still no new drugs available. This most challenging microorganism is fascinating and its successful study requires patience and a genuine love of research.

One could imagine if we were to meet Dr. Koch, who discovered the etiological agent of tuberculosis, on our continuous journey of researching this challenging microorganism, what could we tell him? This can be an interesting homework assignment reinforcing certain concepts in microbiology, or for bringing historical awareness and appreciation of the understanding of the fascinating field of mycobacteria.The following is an example of this homework assignment that one of my students wrote in a letter to Dr. Koch and how this experience affected his appreciation and understanding of the field.

"Dear Dr. Koch,

My name is Max Rutter, a student at Harold Washington College. I heard your name for the first time when I took a Biology class at Harold Washington College in Chicago, taught by ProfessorMovahedzadeh. Professor Movahedzadeh told our class that TB is an ancient disease that currently infects one third of the world population [1].

It is hard to believe that it has been nearly 130 years since your discovery of the tubercle bacillus [2], and a cure for TB has yet to be developed. The bacteria have developed incredible resistance to antibacterial drugs, and it has been 40 years since the last effective treatment was found. My professor works in a tuberculosis research institution at the University of Illinois at Chicagoas part of a drug-discovery team of researchers who have been dedicating enormous efforts and time to discover a new drug for tuberculosis.

Although my professor has made us aware of TB, I was drawn to know more about it after my sister returned from a two-year humanitarian trip to Kyrgyzstan, an old Soviet Bloc country. She was working among a population who had struggled with tuberculosis for decades. As her service commitment ended and left the country, she had tested negative for TB. She then spent a little more than a month traveling throughout India and Thailand on her way back to America. Once she returned, she eventually applied for a job at a local hospital which required a new TB test. This time the result was positive for a tuberculosis infection. After a chest x-ray, it was decided that my sister had the latent form of the disease, so her health was not compromised. Regardless, her doctors put her on a treatment of Rifampin for four months to ensure that the bacteria would not begin propagating and cause tubercles on her lungs.

She successfully completed her treatment and is still healthy today. All during the period of her treatment, I could not stop wondering why there should be three different medications for four months of treatment in patients with active tuberculosis and that they need to be taken for such an extended period of time!It seems as if 130 years should be enough time for scientists to discover an effective medicine.

My sister was a lucky person to have the resources readily available to her to combat the disease before it became a problem. Every year, more than 1.3 million people die from tuberculosis [3]. In addition, over 9.4 million people are newly infected each year [4], and unfortunately, treatment is not readily accessible to all of these people. I wonder if you were here, could you come up with a drug which shortens the treatment. I was told that philanthropic organizations, such as the Bill Gates Foundation, prefer to give funding to this kind of research proposal. In my biology class, where I heard your name for the first time, I learned that science is only able to go forward with enough funding and support to allow for new developments.Although we have multi-drug resistance TB and extremely drug resistance TB [5], as well as TB being the primary killer of HIV/AIDS patient [6], researchers are not yet getting enough funding to combat this disease or even to shorten the needed period of treatment".

Max has since graduated with an A.Sc. degree from Harold Washington College and has transferred to UIC and is currently in his final year of studies towards getting his B.Sc. degree. He has been working as a student lab technician in the Institute for Tuberculosis Research (ITR) located at College of Pharmacy for over two years. The love for doing research on TB is indeed contagious!

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***Corresponding author:** Farahnaz Movahedzadeh, Harold Washington College & Institute for Tuberculosis Research, University of Illinois at Chicago, USA, E-mail: movahed@uic.edu

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