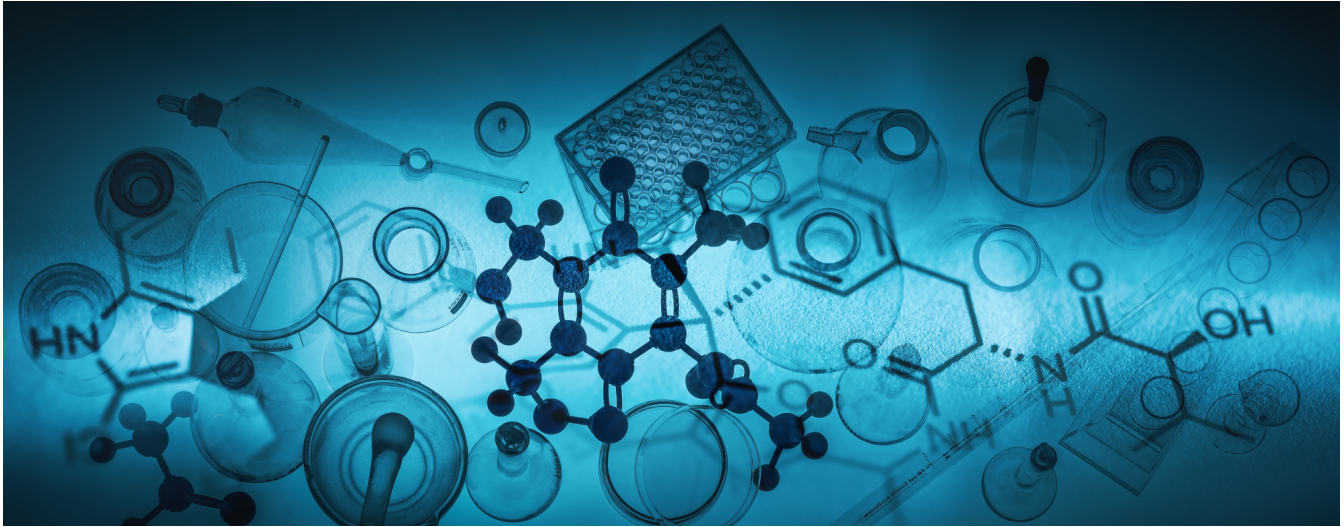


THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

We at The Mueller Health Foundation want to wish everyone a healthy and successful start to the **New Year 2023!**

This month, we will also be publishing our **Annual Report for 2022** on our website and social media channels. We are very proud of all of the hard work that our grantees, partners, and collaborators have completed over the last year and we are excited to be able to share new insights and findings from our on-going projects.

Stay tuned for more updates!

LATEST NEWS: SHOWCASING STORIES OF TB SURVIVORS

We at The Mueller Health Foundation continue to be deeply committed to sharing personal stories and giving a voice to TB patients, TB survivors, TB practitioners, and all the friends and family members of the people who have been affected by the disease. The Center for Disease Control and Prevention (CDC) has put together a wonderful collection of stories and this month we would like to highlight Natalie's story. Natalie contracted multidrug-resistant tuberculosis (MDR-TB) while volunteering as a physical therapist in South Africa. Here is an excerpt from her journey:

In 2007, Natalie, a 35-year old woman from Tennessee, traveled to South Africa for approximately 5 months where she worked as a volunteer physical therapist, treating patients affected by TB and HIV. Upon her return from her trip, she experienced severe gastrointestinal symptoms that would not go away. Eventually, she was diagnosed and treated for ulcerative colitis, but soon she began to develop other systems including chest heaviness and troubled breathing. She was treated for pneumonia. Unfortunately, after years of unsuccessful treatment of her pneumonia and gastrointestinal symptoms, she was finally diagnosed with pulmonary TB, and eventually MDR-TB in the summer of 2009. She was treated for MDR-TB for almost 2 years in Nashville. Her strain of TB was resistant to seven different drugs and the treatment was long, and she endured difficult side effects from the medicines. On January 21, 2013, she finally celebrated 2 years of being off of TB medications and living TB free. She has since become a vocal TB activist. She speaks openly about the stigma related to having TB; she says: "I knew what the word stigma meant, but it was during this time that I learned how stigma feels. In South Africa, when I worked as a physical therapist, I remember how difficult it was for my patients to talk about TB. It carried a "dirty" stigma. At times during my own experience here in the United States, I also felt the weight of that stigma." She hopes to continue to inspire others by sharing her story and says: "I learned that speaking up can and does make a difference. Every single time that I talk about TB, I think of the courage of my patients from South Africa. They had so much to lose: their family, their friends, their jobs, their houses. Today I speak on their behalf. I'm so grateful to be alive, and I want to give a voice to people suffering from this disease." To read her full story please follow the link to the Center for Disease Control and Prevention's website here: <https://www.cdc.gov/tb/topic/basics/nataliestory.htm>

For more news, please also take a look at our top 3 picks for January in this newsletter, where we highlight novel research findings and news around the prevention and treatment of tuberculosis around the world.

MHF TOP PICKS FOR JANUARY

Every month, we at the Mueller Health Foundation like to showcase interesting news and updates in the field of tuberculosis. Below are our top 3 picks for **January**:

1. Genome Assembly Tool Could Spur the Development of New Treatments for Tuberculosis

Researchers have developed a novel genome assembly tool that could spur the development of new treatments for tuberculosis and other bacterial infections. The new tool, which to date has created an improved genome map of one tuberculosis strain called H37Rv, could also be used for other TB strains as well as other types of bacteria. This new pipeline tool, dubbed Bact-Builder, combines common open-source genome assembly programs into a novel and easy-to-use tool which is freely available on GitHub. Having an easy way to sequence all TB strains accurately is even more important, because strain comparison could provide more insight into why some strains are more contagious than others or why some are more difficult to cure. These findings in turn can then inform improved and more tailored treatment options for patients.

To learn more about the research, you can access the full paper at: <https://www.nature.com/articles/s41467-022-34853-x>

2. Study Find that Immune-evading Mycobacterium Tuberculosis Prevents Inflammatory Responses by Hijacking the Host's Ubiquitin

A recently published article by the Chinese Academy of Sciences in Beijing revealed that triple specificity protein phosphatase (ptpB) secreted by Mycobacterium tuberculosis inhibits pyroptosis and the release of cytokines by macrophages, allowing M. tuberculosis to invade the immune system. Overall, the results from the study revealed that the effector protein ptpB secreted by M. tuberculosis binds to ubiquitin in host cells and dephosphorylates phosphatidylinositols, inhibiting the cleavage of the N-terminal of gasdermin D. This prevents pyroptosis and the secretion of pro-inflammatory cytokines, allowing M. tuberculosis to escape the host's immune system. The findings of the study can help to shed light on the mechanisms through which immune-evading tuberculosis might be infecting the host. To learn more, you can read the paper here: <https://www.science.org/doi/10.1126/science.abq0132>

3. UC Study Explores How People with Latent TB Are More Prone to Inflammation and Cardiovascular Disease

Newly published research from the University of Cincinnati finds that people with latent tuberculosis infection (LTBI) have more inflammation and could be at a higher risk for cardiovascular disease. The research team analyzed blood samples from individuals with LTBI in Peru between the ages of 40 and 70. The study focused on monocytes, a type of white blood cell, and the researchers measured markers associated with immune activation and with cardiovascular disease. They found differences in the expression of monocyte markers that are important not only for infection control but also for atherogenesis, the process of plaque formation in the arteries leading to coronary artery heart disease. While additional research is needed, this study and other research in this area can help to highlight that infections in general have a role in cardiovascular disease risk, as evidenced in cases of influenza, HIV and more recently COVID-19. You can learn more and access the full paper here: <https://academic.oup.com/ofid/article/9/12/ofac629/6833630?login=false>

DID YOU KNOW?

In the foothills of South Mountain Park located near Phoenix, Arizona a structure called the "Mystery Castle" was built in the 1930s and still exists today. The castle was built by Boyce Luther Gulley for his daughter Mary Lou Gulley.

After learning he had tuberculosis, Gulley moved from Seattle to the Phoenix area. Knowing he would ultimately succumb to the disease, Gulley wanted to build the castle as a way to be remembered by his family. Shortly after arriving in Phoenix, he began building the castle from found or inexpensive materials.

The castle is said to be held together by a combination of mortar, cement, calcium, and goat milk. The sprawling 18-room, three story castle is also built from a wide range of materials – stone, adobe, automobile parts, salvaged rail tracks from a mine, telephone poles, and many other items. It features a chapel, cantina, and a dungeon.

Gulley passed away in 1945 and Mary Lou and her mother moved into the castle and soon started offering tours of the unique building. Although parts of the castle remain unfinished, and electricity and plumbing were not added until 1992, Mary Lou spent her entire life living in the castle. She passed away in 2010 and the castle is now maintained by the Mystery Castle Foundation and offers tours until this day.



Information and Picture Source:
https://en.wikipedia.org/wiki/Mystery_Castle