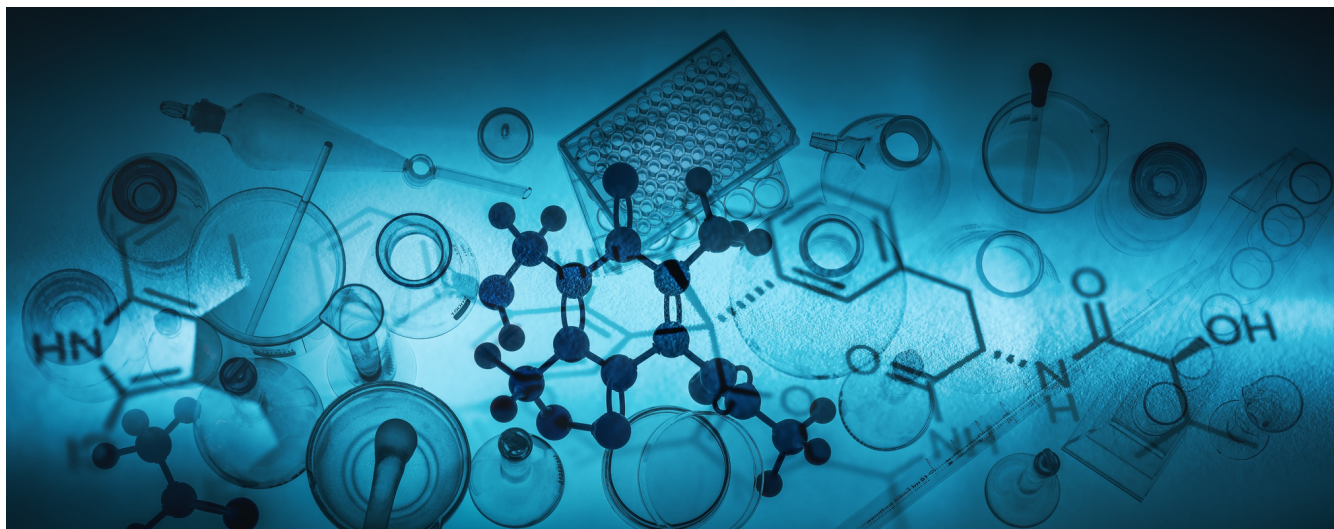


THE MONTHLY DOSE

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 joyous and healthy **Holiday Season!**

We also wanted to express our gratitude and thanks to all of our supporters, partners, and collaborators around the globe for the outstanding work they have been doing and for tirelessly helping us to fight tuberculosis and infectious diseases!

We are looking forward to an inspiring **New Year 2023** and are excited to share our Annual Report next month.

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 Shaka's story. Shaka wants to share his experience of being diagnosed and treated for disseminated TB disease, which means TB had spread to other parts of his body beyond the lungs. Here is an excerpt from his journey:

At first Shaka thought he had the flu. He had chills, was tired all the time, and had no appetite. After almost a month of night sweats, chest pain, persistent cough, and losing about 30 pounds, Shaka knew something was really wrong and went to see the doctor. After several more weeks of doctor visits and exams, and worsening symptoms, he was admitted to the hospital. Eventually he was diagnosed with TB. He soon learned that he had disseminated TB, which meant TB had spread to other parts of his body beyond the lungs. Although he was relieved to have a diagnosis, Shaka soon began to struggle with his difficult treatment process. Shaka stated: "There's a lot of drugs, a whole lot of drugs to take. I ended up having to take 17 pills each day. It was kind of like going to school, where you just hope that there's an emergency at school or a snow day, or just something that you just don't have to get them that day. And those days never happen. They kept coming." Nonetheless, he continued his treatment. Friends and family visited Shaka in the hospital during his recovery. They often asked him questions about TB and his treatment. Shaka researched and read about TB, and asked his health care team lots of questions. Before long, he was able to use what he learned to educate family and friends about TB. Since his recovery, Shaka has been an avid TB advocate. His message to those recently diagnosed with TB is "it can be very scary, but there is a cure. I want folks to be aware of TB and know that it's something that we're prepared to deal with, and that we can do things about it." To read his full story please follow the link to the Center for Disease Control and Prevention's website here: <https://www.cdc.gov/tb/topic/basics/shakastory.htm>

For more news, please also take a look at our top 3 picks for December 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 DECEMBER

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 December:

1. Mini Bio-Devices Could Help TB Patients Stick to Their Treatments

Scientists are working to develop technologies that can accurately and reliably calculate an individual's drug-metabolizing capacity by measuring the traces of anti-TB drugs in the TB patient's blood or urine samples. The method involves the use of enzyme-based biosensors, a device used to detect chemical or biological substances. In a recent study, a simple biosensor was successful in detecting all four first line anti-TB drugs i.e. isoniazid, ethambutol, pyrazinamide and rifampicin with limits of detection ranging from 0.02244 to 0.1072 nM in 0.1 M phosphate buffer. An improvement in the ability to better trace drug remnants would better allow TB treatments to be tailored on an individual patient basis, minimize adverse drug reactions and improve the quality of life in TB patients.

To learn more about the research, you can access the full paper at: <https://analyticalsciencejournals.onlinelibrary.wiley.com/doi/abs/10.1002/elan.202060384?af=R>

2. Study Finds that Tuberculosis Induces Premature Cellular Aging

Even after successful therapy for tuberculosis, survivors of the disease have an increased risk of recurrent infection and death. A study published by researchers at Baylor College of Medicine found that the cells of humans and animals who have recovered from tuberculosis had prematurely aged up to 12 to 14 years. To measure the aging of the cells, researchers looked at the epigenetic clock of the cells. Epigenetics looks at how the DNA inside every cell is coiled. As we age, how the DNA is coiled changes, and severe infection is changing it in such a way to increase premature aging. In this study, the researchers studied multiple cohorts and multiple tissue types, and discovered that tuberculosis induced perturbations in epigenetic regulation, specifically in the regulation mediated by DNA methylation. These changes correlated with oxidative stress-induced senescence and was associated with premature cellular aging. These processes were conserved across both guinea pigs and humans. To learn more, you can read the paper here: <https://www.sciencedaily.com/releases/2022/03/220324130315.htm>

3. Mylab Launches Automated Test Kit for TB and Multi-Drug Resistant TB

Mylab has received approval from the Central Drugs Standard Control Organisation (CDSCO), TB Expert Committee, and the Indian Council of Medical Research (ICMR) for its made-in-India kit that detects tuberculosis and multiple drug resistance to rifampicin and isoniazid through a single test. The RT-PCR-based PathoDetect MTB RIF and INH drug resistance kit will be used with Mylab Compact device systems, which allow automated testing of multiple samples within two hours. The kit was approved after field trials and recommended by the TB Expert Committee under the aegis of ICMR. Multi-center evaluation studies and field feasibility testing were carried out at TB research centers, which evaluated it against the currently used diagnostic assays for tuberculosis. Until now, Indian healthcare workers had to conduct two tests: one to detect TB and one to check for drug resistance. With Mylab's kit, in a single test patients can now know if they have active TB infection as well as drug resistance to two of the most common drugs, isoniazid and rifampicin.

You can learn more and access the full article here: <https://www.thehindubusinessline.com/news/mylab-launches-automated-test-kit-for-tb-multi-drug-resistance/article66204206.ece>

DID YOU KNOW?

The Center for Disease Control and Prevention (CDC) recently released a report titled *"Reported Tuberculosis in the United States, 2021"*. The report describes information on TB disease reported to the CDC since 1993, with an emphasis on TB disease cases counted by the reporting jurisdiction in 2021 and the ongoing effects of the COVID-19 pandemic on TB disease surveillance. Below is a summary of the key points from the report:

- The reported number of TB cases in the United States increased from 7,171 TB cases in 2020 to 7,882 TB cases in 2021, a 9.9% increase.
- The national TB incidence rate increased from 2.2 cases per 100,000 persons in 2020 to 2.4 cases per 100,000 persons in 2021. Nine states and the District of Columbia reported TB disease incidence rates higher than the national TB disease incidence rate.
- As in past years, cases of TB disease were not evenly distributed across the United States. Four states account for almost half (49.9%) of all reported US TB cases: California, Texas, New York (including New York City), and Florida.
- In 2021, people from racial and ethnic minority groups and non-US-born persons continued to be disproportionately affected by TB disease in the United States, highlighting the persistent health disparities and inequities among people with TB disease.

Information Source:
[https://www.cdc.gov/tb/statistics/reports/2021/default.htm?ACSTrackingID=USCDC_18_1-DM94384&ACSTrackingLabel=CDC%20Releases%20Reported%20Tuberculosis%20in%20the%20United%20States%2C%202021"&deliveryName=USCDC_18_1-DM94384](https://www.cdc.gov/tb/statistics/reports/2021/default.htm?ACSTrackingID=USCDC_18_1-DM94384&ACSTrackingLabel=CDC%20Releases%20Reported%20Tuberculosis%20in%20the%20United%20States%2C%202021)