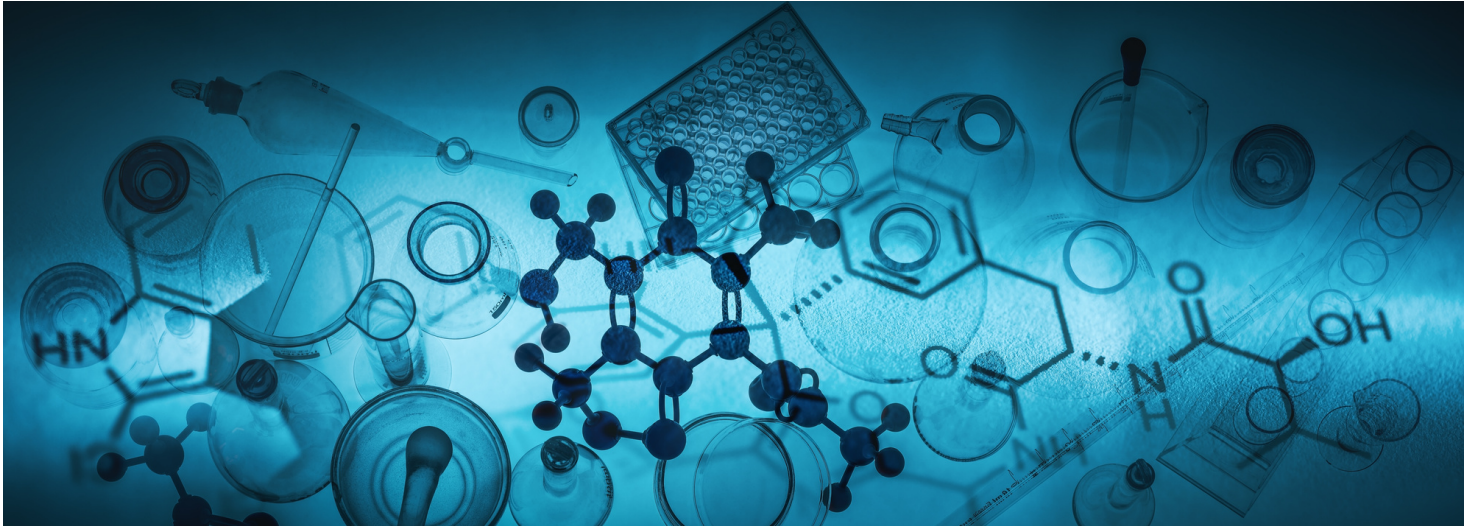


THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



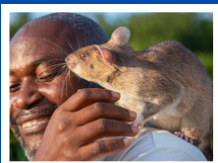
WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

We at the Mueller Health Foundation are pleased to update you on Carolina, our dedicated HeroRat from APOPO.

Each month, Carolina continues to screen thousands of TB samples in Tanzania with exceptional accuracy. However, as her 8th birthday approaches, Carolina is expected to retire in the next few months.

Upon Carolina's retirement, we will seamlessly transition our adoption to a new TB detection rat and continue the great work that Carolina and her HeroRat friends have been doing.

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. We are also proud to continue our support of our HeroRat Carolina who has been trained by APOPO, a charity focused on training rats to detect TB in sputum samples across Africa. APOPO has put together a wonderful collection of success stories from TB survivors and this month we would like to highlight Maria's story:

Maria Nhamtumbo, who lives in Mozambique and is a 39-year-old mother of four, believes she contracted tuberculosis from her husband while caring for him during his TB illness. Despite the negative stigma often associated with TB in her community, Maria knew that with proper treatment, she could be fully cured. Having learned from her husband's experience, she was relieved when her friends and church community responded with kindness and support. However, TB severely impacted Maria's work and income, as she became extremely weak, experienced constant pain, and lost her appetite. Her clinic sent her sample to be tested by APOPO, where HeroRATs detected TB. The lab confirmed the results, and Maria's clinic notified her so she could begin treatment. She underwent a six-month course of antibiotics, with regular re-testing, and eventually, her tests came back negative. Maria is grateful to APOPO, the HeroRATs, and the community health workers (Kenguelekeze) for their support throughout her treatment. Without the diagnosis, she might not have received the necessary treatment, which could have led to more severe consequences for her and her children. Maria was initially amazed and apprehensive about the African giant pouched rats trained by APOPO to detect TB. However, she soon realized how crucial the HeroRATs were in identifying the bacteria in her sample. Now, Maria advises others to visit any health clinic partnered with APOPO for testing. To read her full story please follow the link here: <https://apopo.org/what-we-do/detecting-tuberculosis/success-stories/maria/>

For more news, please also take a look at our top 3 picks for **August** 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 AUGUST

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

1. Study Shows that Shared Geographic Origin between TB Strain and Human Host Could Amplify Risk for Infection

A new study shows that for some forms of tuberculosis, the likelihood of infection depends on whether the exposed person and the bacteria share a geographic origin. In the analysis, believed to be the first controlled comparison of TB strains' infectivity in populations of mixed geographic origins, the researchers custom built a study cohort by combining case files from patients with TB in New York City, Amsterdam, and Hamburg. The analysis showed that close household contacts of people diagnosed with a strain of TB from a geographically restricted lineage had a 14 percent lower rate of infection and a 45 percent lower rate of developing active TB disease compared with those exposed to a strain belonging to a widespread lineage. The researchers found that the odds of infection dropped by 38 percent when a contact is exposed to a restricted pathogen from a geographic region that does not match the person's background, compared with when a person is exposed to a geographically restricted microbe from a region that does match their home country. To learn more, you can access the full paper at: <https://www.nature.com/articles/s41564-024-01758-y>.

2. Study Identifies Biomarkers to Pave the Way for New Lateral Flow Tests to Diagnose More People with TB

The research seeks to address the urgent need for accurate point-of-care testing that does not rely on sputum expectoration or specialist equipment. Proteins are excellent candidates for diagnostic biomarkers, being stable and utilizable for near-patient diagnostic tests. In this study, the team of researchers applied a highly sensitive non-depletion tandem mass spectrometry discovery approach and bioinformatic analysis to samples from a cohort in South Africa as well as to samples from a cohort in the UK. Using linear modelling and network correlation analyses, they identified 118 differentially expressed proteins. These were then narrowed down to six that could distinguish contagious TB from healthy controls and other respiratory infections. The researchers hope that these six blood proteins will pave the way for the development of an affordable, sensitive, specific, user-friendly and rapid point-of-care test that could be used in resource-limited settings. This could be particularly helpful for case finding and reducing TB rates in communities of high disease instance. To learn more, you can read about the research here: <https://insight.jci.org/articles/view/173273>.

3. Study Shows New AI-based TB Detection Software Trumps 11 Other Products

The medical AI company Lunit's chest X-ray analysis software INSIGHT CXR has demonstrated superior performance in tuberculosis detection. The study showed that INSIGHT CXR achieved the highest accuracy out of 12 tested AI-based TB detection products. Additionally, the device showed 89.9% sensitivity at 67.7% specificity, and 89.5% sensitivity at 70.2% specificity, meeting the World Health Organization (WHO) target product profile. Researchers at the Heidelberg University Hospital in Germany and the Stop TB Partnership at UNOPS assessed the 12 products using data from South Africa's national TB prevalence survey. The study involved 774 participants, including 258 confirmed TB cases, and is the first to comprehensively evaluate these AI tools in a high TB setting. These results suggest that this could be a valuable tool for TB screening in both developed and developing countries. You can read the full paper here: [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(24\)00118-3/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(24)00118-3/fulltext)

DID YOU KNOW?

Given that Texas is ranked #2 in the United States among the states with the most tuberculosis incidences, we wanted to share some key facts below based on the latest data available from 2022:

- In 2022, **7,415** Texans were exposed to TB. Public health departments treated over **2,900** people for TB infection and **50** Texans died of TB in 2022.
- In 2022, **24** children under the age of five developed active-TB: of those, **29.2** percent had TB meningitis, as compared to **1.9** percent of adult TB cases. While TB meningitis can be treated, children can end up with permanent disability if not connected to care early enough.
- In 2022, counties bordering Mexico represented **21.2** percent of TB cases in Texas, although only **9.5** percent of the Texas population live in a border county.
- TB can more easily spread in congregate settings:
 - In Texas in 2022, **60** people (5.5 percent) were diagnosed in the following congregate settings:
 - 12 in long-term care facilities
 - 6 in homeless shelters
 - 42 in various other congregate settings
 - Additionally, **23** people (2.1 percent) were diagnosed in a city or county jail.
 - Furthermore, **84** people (7.7 percent) were diagnosed in other correctional facilities such as federal prison. An additional **78** people were diagnosed in other correctional facilities (detention facilities and Immigrations and Customs Enforcement [ICE] facilities).
- Regarding drug-resistance, in 2022, Texas reported **157** people diagnosed with TB to have drug resistance to at least one TB medication.

Information Source:
<https://www.dshs.texas.gov/tuberculosis-tb/tb-data-statistics>