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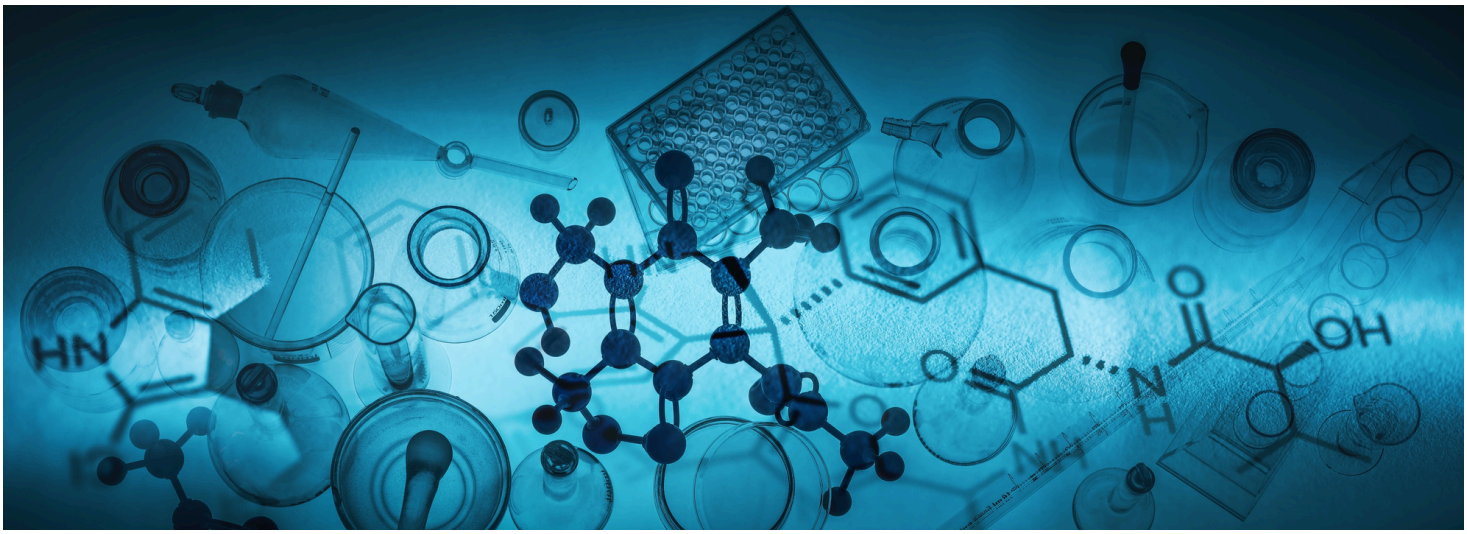
THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

We at The Mueller Health Foundation are very excited to announce that our first of its kind blockchain application, TBConnect, has been selected as 1 of 6 finalist projects in the Tech for Good category in the prestigious Global Digital Revolutions Awards 2024.

We are deeply honored by this recognition and remain committed to our mission of making a meaningful impact in global health. As we eagerly anticipate the mid-June announcement of the winners, we extend our best wishes to all fellow finalists.

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 Hadija's story, a young mother with five children from Tanzania:

It all started on the street where Hadija and her family live, when community health workers were calling people to speak to them about tuberculosis and offered free testing. Hadija did not think that she had TB, but after their awareness education, she recognized the symptoms and decided to give a sputum sample to be tested by one of the APOPO HeroRats. Hadija had been having night sweats, a consistent cough and chest pains over the past few weeks, but the clinic she originally went to was unable to diagnose her. Then the community health worker told her how TB can be passed on from family member to family member and even lie dormant for years. She became worried that she might have gotten it from her sister, who had TB. Within a day after testing, Hadija got a call and was asked to go to Kizuiani Hospital. When she got to the hospital, they told her that they had found that she was TB-positive. She began treatment immediately and the clinic taught her how to look after herself and how to protect her family. They explained that she could be cured, but that it was very important to finish the whole course of treatment even if she started feeling better. After a few weeks they said a health care practitioner would even bring her medication to her home. After 7 weeks they changed Hadija's medication and finally 6 months later she was healed completely. The most challenging part of her recovery was being isolated and relying on her husband to take care of the family. This meant sometimes her children were eating late, well past their bedtime. And she also had to wait for food to take her medication. However, Hadija is grateful for the help of her husband as he did what he could to make ends meet. Things are slowly getting back to how they used to be for Hadija and her family. To read her full story please follow the link here: https://apopo.org/what-we-do/detecting-tuberculosis/success-stories/hadija/

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

The Mueller Health Foundation

MHF TOP PICKS FOR MAY

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 **May:**

1.Bacteriophage Therapy for the Treatment of Mycobacterium Tuberculosis (MtB) Infections in Humanized Mice

Bacteriophage therapy, which uses viruses that infect bacteria to treat bacterial infections, has gained attention as a potential alternative to antibiotics. Phages have been successfully utilized in controlling bacterial infections, including those caused by drug-resistant strains. In this study, the researchers evaluated the efficacy of bacteriophage DS6A in killing Mtb. Initial experiments demonstrated DS6A's ability to efficiently eliminate Mtb in culture plates and liquid cultures. To evaluate DS6A's efficacy in vivo, the researchers utilized a humanized mouse model with enhanced reconstitution of human immune cells, providing a more clinically relevant platform for TB research. TB-infected mice treated with DS6A exhibited improved pulmonary function, reduced bacterial burden in spleens, and increased survival rates compared to untreated mice. These findings suggest that phage therapy, particularly using DS6A, holds promise as an effective therapeutic strategy for TB treatment. Further research is needed to understand the mechanisms underlying phage-mediated bacterial clearance, optimize treatment protocols, and address challenges such as phage distribution and potential development of resistance. To learn more, you can access the full article at: https://www.nature.com/articles/s42003-024-06006-x

2.Study Finds Tuberculosis Linked to Increased Risk of Cancer

A population-wide observational study to be presented at this year's European Congress of Clinical Microbiology and Infectious Diseases shows an association between tuberculosis and cancer, with those with current or previous TB more likely to have a diagnosis of a variety of cancers, including lung, blood, gynaecological and colorectal cancers. The researchers retrospectively reviewed data from the National Health Insurance Service-National Health Information Database of South Korea between 2010 and 2017. The final analysis included a total of 72,542 patients with TB and 72,542 matched controls. The mean follow-up duration was 67 months (around five-and-a-half years), and the mean age in patients with TB was 62 years. Compared with the general population, the incidence of cancer was significantly higher in TB patients: 80% higher for all cancers combined; 3.6 times higher for lung cancer, 2.4 times higher for blood cancers; 2.2 times higher for gynaecological cancer; 57% higher for colorectal cancer; 56% higher for thyroid cancer and 55% higher for oesophagus and stomach cancer. To learn more, you can read about the research here: https://www.news-medical.net/news/20240401/Tuberculosis-linked-to-increased-risk-of-cancer-study-finds.aspx

3.Repurposed Cancer Drugs May Improve Tuberculosis Treatment

In a study conducted in rabbits, led by Harvard Medical School researchers at Massachusetts General Hospital, two repurposed cancer drugs enhanced delivery of antibacterial medications that target tuberculosis-causing bacteria. The researchers used a rabbit model of tuberculosis to test two drugs known as host-directed therapies, or HDTs. One, bevacizumab, acts on blood vessels, and the other, losartan, targets the extracellular matrix. The drugs were originally designed to enhance drug delivery to cancer cells by improving the structure and function of blood vessels around tumors, which can be compromised in cancer. Previously, the reseachers showed that bevacizumab could improve antibacterial drug delivery to tuberculosis lung masses. In this study, the researchers have also shown that combining bevacizumab with losartan enhances this drug delivery, promotes antibacterial responses, and improves health outcomes. Surprisingly, the HTDs reduced bacteria numbers in lung masses even without antibacterial agents. Bevacizumab and losartan are approved by the FDA, safe, and affordable, so the study lays the groundwork for directly translating the results into the clinic, once trials with TB patients have been conducted. You can read the full paper here: https://pubmed.ncbi.nlm.nih.gov/38530888/

DID YOU KNOW?

Racial and ethnic disparities in tuberculosis incidence persist among the U.S.-born population, according to a new study led by researchers at Harvard T.H. Chan School of Public Health. Here are some interesting facts and provisional data from the study:

- More than 70% of TB cases in the U.S. occur among people born outside the country, and between 2000 and 2019, cases among people born in the country decreased by more than 45%. Nonetheless, each year thousands of cases of the highly infectious disease continue to occur within the U.S.-born population.
- The researchers looked at the racial and ethnic breakdown of nearly 32,000 TB cases reported within the U.S.-born population between 2011 and 2021. TB incidence was in some cases 14 times higher among those who identified as American Indian/Alaska Native, Asian, Black, or Hispanic compared with those who identified as white.
- Disparities were particularly marked among women belonging to racial/ethnic minority groups, who experienced TB incidence rates more than four times higher than white women.
- Eliminating such disparities, the researchers calculated, could reduce the U.S.'s TB incidence by more than 60% among the U.S.-born population.
- Given the substantial excess burden of TB among racial/ethnic minority populations, addressing these disparities in TB incidence is necessary for achieving health equity goals and can only be achieved by making TB prevention tools, diagnostics, and treatment accessible and affordable.

Information Source:
https://www.acpjournals.org/doi/10.7326/M23-2975