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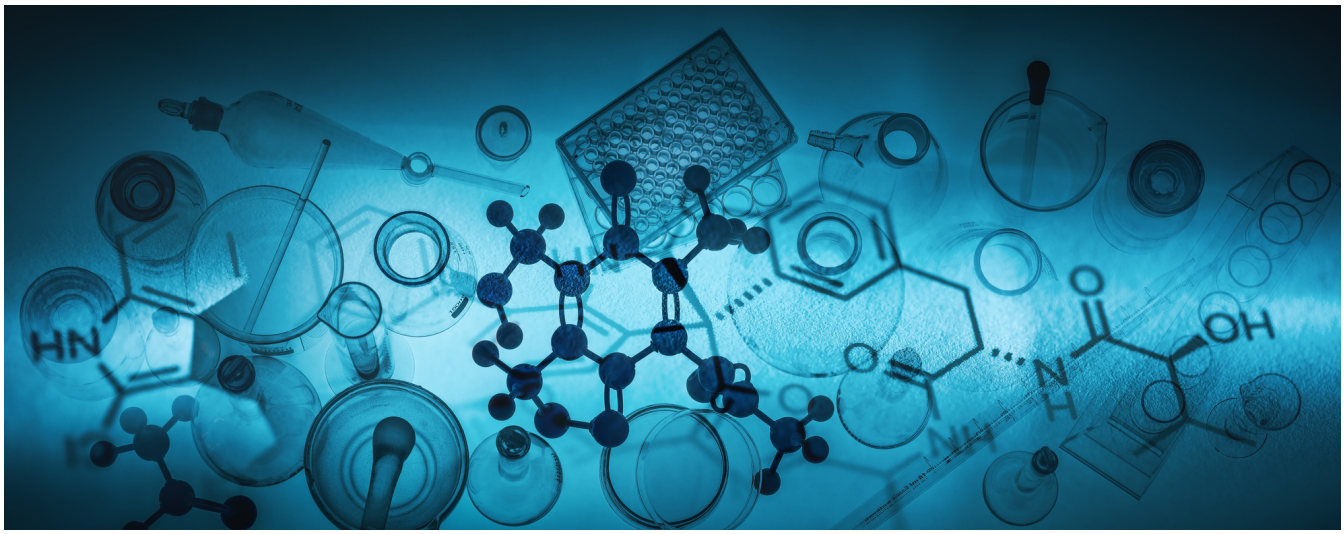
THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

We at The Mueller Health Foundation are excited to share that MSNBC24 has featured a great article about our blockchain powered platform TBConnect, which aims to support the "Open Data" revolution in the field of tuberculosis by fostering information and idea sharing from many different stakeholders.

You can access the article using the following link: https://msnbc24.com/2024/01/30/tbconnect-tackling-tuberculosis-through-open-data-and-blockchain-technology/

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. TB Alert, a charity focused on TB in the United Kingdom, has put together a wonderful collection of stories. This month we would like to highlight Gemma's story, a resident of South London, who was 23 when she was diagnosed with tuberculosis:

Although TB was discussed and suspected at Gemma's first visit to the doctor, it took six months from the referral from her General Practitioner until she was started on anti-TB medication. "In the interim they were convinced it was cancer, and many other nasty sounding diseases " says Gemma. After numerous tests, she was treated by the professor of medicine at St Georges Hospital in London for TB of the kidney. Gemma has always lived in South London, and although she has done a little traveling, she had no idea how she picked up TB; however, it is suspected she may have first picked it up at school. The start of treatment was particularly tough for Gemma as she felt very lethargic and the medication made her experience severe nausea. Her treatment lasted six months. Gemma recalls: "When I found out I had TB I was actually relieved! By that point I felt so awful I just wanted answers, it was awful not knowing." Gemma's family was very supportive of her during this time, but others found it more difficult. She found that no matter how much she explained to people it was not contagious at that point, there still was a lot of stigma surrounding the disease. She states: "At the worst point of my TB, I was completely fed up, but too tired to be angry at it anymore! It was a bad time, for me and everyone around me. If I look at photos of me and my family at that point, I'm not the only one who looks ill! It was incredibly tough, but has made me a stronger person." Gemma's wants others to know that: "Today I am absolutely fine; following my treatment I started running to gain back some of the muscle loss from the result of being ill. Since then I have even completed the London marathon and a number of half marathons." To read her full story please follow the link here: https://www.thetruthabouttb.org/tb-stories/gemma/

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

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 **February:**

1.Multimodal AI Model May Provide Insights into Personalized Treatment for Tuberculosis

A team of researchers at the University of Michigan has developed a multimodal Artificial Intelligence (AI) model to predict treatment outcomes of tuberculosis (TB) patients. In the study, the researchers used AI to analyze multimodal data including over 200 diverse biomedical features from clinical tests, genomics, medical imaging and drug prescriptions from over 5,000 TB patients. By analyzing data from patients with varying levels of drug resistance, they discovered biomedical features predictive of treatment failure. They also uncovered drug regimens effective against specific sets of drug-resistant TB patients. The researchers also found that certain drug combinations worked better in patients with some types of resistance but not others, leading to treatment failure. The researchers also confirmed that drugs with antagonistic pharmaceutical interactions could result in worse outcomes. To learn more, you can access the full paper at: https://www.cell.com/iscience/fulltext/S2589-0042(24)00246-3?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2589004224002463%3Fshowall%3Dtrue

2. Tuberculosis Cases Rise in the United States, but Public Health Agencies Say They Lack the Resources to Keep Up

Contrary to public perception, tubercuosis is still active in the United States. The number of TB cases in the U.S. briefly dropped at the start of the pandemic, but there was a 5% increase in cases in 2022. Nationally, those numbers are still lower than they were before the pandemic, but some states including Alaska, Nevada, South Carolina and Washington have exceeded their pre-pandemic figures, according to a CDC report citing state data. Even as the number of U.S. tuberculosis cases rises, public health experts say, awareness is lagging. And state and local health departments lack the resources to keep up with prevention and control efforts. To further complicate the issue, an estimated 13 million people in the U.S. are living with latent tuberculosis, the CDC says, and many of them do not know they have the disease. Experts say awareness around risk factors is imperative, so that people can get tested and prevent spread in case it becomes active. To learn more, you can read the article here:https://missouriindependent.com/2024/02/09/tuberculosis-cases-rise-but-public-health-agencies-say-they-lack-the-resources-to-keep-up√/

3.Tracking T cell Activity May Aid to Uncover Promising Tuberculosis Vaccine and Drug Targets

For this study, the researchers from La Jolla Institute for Immunology (LJI) worked with samples from patients who were mid-treatment for active TB. These samples came from study participants in Peru, Sri Lanka, and Moldova. T cells are critical for stopping infections from spreading in the body. Instead of targeting an entire pathogen, T cells look for specific markers, called peptides sequences, that belong to the pathogen. When a T cell recognizes a certain part of a pathogen's peptide sequence, scientists call that area an epitope. Uncovering T cell epitopes gives scientists vital information on how vaccines and drug treatments might take aim at the same epitopes to stop a pathogen. In their analysis, the LJI team uncovered 137 unique T cell epitopes. They found that 16 percent of these epitopes were targeted by T cells found in two or more patients. Going forward, the researchers will investigate which of these epitopes may be promising targets for future TB vaccines and drug therapies. You can the full paper here: https://www.nature.com/articles/s41467-024-45058-9

DID YOU KNOW?

Tuberculosis claims the lives of over 600 children under 15 every day. Understanding TB is crucial, especially in children, where the disease develops rapidly. Here are some key facts:

- **Global impact:** Children account for 11% of all TB cases. The World Health Organization reported an approximate 10.6 million global TB cases in 2022, 1.3 million of those being children, emphasizing the widespread impact of this airborne infectious disease across all countries.
- **Impact in the United States:** According to the CDC, while people ages 65 and older had the highest TB rates in the United States in 2022, there was a 29% increase of TB among children under 5 years and a 24% increase of TB among people ages 15-24 years in 2022.
- **Vulnerability of younger children:** Children under 5 are particularly at risk, facing rapid disease progression. Furthermore, multidrug-resistant TB (MDR-TB) poses a substantial threat to public health and vulnerable populations such as children. In 2022, only about 2 in 5 people with MDR-TB accessed intensive treatment.
- **Challenges in diagnosis:** Children's symptoms can be non-specific, making diagnosis difficult. Conventional diagnostic tools may not be as effective in detecting pathogens in their lungs.
- **Unique immune challenges:** Children are more likely than adults to develop extra-pulmonary TB, which is TB that affects organs other than the lungs.
- **Treatment and prevention:** TB in children is both preventable and treatable — and children respond well to prescribed therapies.

Information Source:
https://www.worldvision.org/health-news-stories/5-facts-tuberculosis-tb-children
https://publications.aap.org/aapnews/news/23910/CDC-TB-rates-in-children-under-5-rose-29-in-2022?autologincheck=redirected