

# Newsletter

Volume - 3



India Health Fund (IHF), a Tata Trusts' initiative, was conceived to help accelerate efforts in the elimination of infectious diseases and thereby help reduce preventable deaths from communicable diseases and other public health risks. IHF does this by de-risking the development of promising technology and science-led solutions that have the potential to make a significant difference in the diagnosis, treatment, and prevention of infectious diseases. IHF collaborates with the public and private sectors to facilitate the development, adoption and scaling of these solutions with the aim to improve health outcomes, with a focus on primary care and in low resource settings.

From creating solutions that address unmet healthcare needs to bridging gaps in healthcare inequalities, women innovators are driving change. Their ability to look at healthcare holistically and consider a more participatory approach contributes to delivering solutions that can be adopted into the public health system. Diversity makes science better and women leaders are helping build and motivate diverse teams to champion change, solve problems and drive results.

# Women in science and technology need increased support to thrive

*Empowering women innovators requires action from public and private partners on all fronts: addressing systemic barriers and gender disparities; providing access to funding, support networks, mentors and leadership opportunities; and cultivating supportive work environments.*

*IHF asked partners in the healthcare ecosystem their opinion about issues that need to be addressed to enable more women innovators and entrepreneurs in science and technology.*

“Women at the forefront and in leadership are very important for sustained gender equity. They can also play a vital role in shaping the governance of health,” shares Dr. Pratima Murthy, Director and Senior Professor of Psychiatry, National Institute of Mental Health and Neurosciences. “As role models, women leaders can help inspire young women to pursue careers in this field,” she adds.

To enable equal opportunities at the workplace and balance professional and family priorities, organisations need to provide women with necessary support like opportunities to lead, flexible reporting time, regular online meeting options, and child-care policies, suggests Dr. Upasana Ray, Senior Scientist and Deputy Head at Infectious diseases and immunology division, Council Of Scientific And Industrial Research-Indian Institute of

Chemical Biology. Dr. Tanaya Narendra, the Founder of Dr. Coterus adds that enacting policies that prevent workplace harassment is another step to help boost the participation of women in science and technology.

Dr. Sapna Poti, Director - Strategic Alliances Division, Office of the Principal Scientific Adviser to Government of India (Gol), believes that various initiatives such as the Department of Science and Technology (DST) — Gol’s exchange programme for women startups to Silicon Valley, as well as setting aside a portion of seed funding for women-led ventures can help more women. She surmises that women scientists and industrialists should also reach out to rural schools to encourage aspiring young women entrepreneurs at the grassroots.

# Women-led organisations make up 50% of IHF's portfolio of companies

*IHF's support to enterprising scientists and innovators with funding, capacity building of diverse teams, market access to achieve scale, access to an inclusive innovation ecosystem, networking opportunities with Indian and global stakeholders, and mentoring by expert panels on regulatory requirements and go to market strategies have accelerated women-led organisations to address and solve some of the most pressing issues related to infectious diseases.*

## **OmiX Laboratories — iAMP:**

### **Multiplex platform-based solution to diagnose COVID-19, Tuberculosis (TB) and Influenza with one test**

According to Dr. Sudeshna Adak, the journey to pursue science begins with a love for math and scientific innovations emerge from analytical thinking, logical reasoning and a scientist's drive to excel. As part of a team composed of 80% women, she believes that inclusiveness, a sense of belonging and a common vision are key to connecting with partners and customers, creating value, and bringing great products to market.

After her PhD and academics in the US, Dr. Sudeshna's work in diagnostics of communicable diseases in India exposed her to the lack of advanced healthcare in various parts of the country. She

noticed that poor healthcare outcomes were linked to socioeconomic status and a lack of access to accurate and early diagnoses.

India reported 1.93 million cases of TB in 2021.<sup>1</sup> Influenza burden is estimated at 0.6 -1 million<sup>2</sup> while COVID-19 has claimed 521,070 lives so far in India.<sup>3</sup> Diseases like TB, Influenza and COVID-19 manifest similar symptoms making diagnosis difficult. Patients would need to take multiple, costly and time-consuming tests that could increase the risk of the patient's condition deteriorating.

OmiX Laboratories, co-founded by Dr. Sudeshna Adak is developing the **OmiX iAMP, a multiplex Loop-mediated Isothermal Amplification (LAMP) innovation-based solution that has the potential to enable low-cost, accurate, differentiated diagnosis of TB, Influenza and COVID-19.**

This test with the support of IHF can enable physicians to identify and treat patients with similar symptoms of these diseases, significantly improving patient outcomes with an early diagnosis, initiation of the right treatment, and reducing the risk of undetected spread of infection.

#### **Features of OmiX iAMP solution:**

- **An end-to-end, automated test that does not need a thermocycler**
- **Can potentially report 10x more tests in the same time at 1/10th the combined cost of RT-PCR tests**
- **Is approximately 4x lower in capital expenditure and approximately 1/2 to 1/4 test cost as compared to currently used options, making vast scale adoption more feasible**
- **Reduces the need for a skilled workforce to interpret test results while making the test error-free**

#### **IHF is supporting OmiX Laboratories in:**

- **Manufacturing of the device**
- **Preparing and conducting clinical validation in multi-centre trials**
- **Regulatory approvals**

*The pandemic caused OmiX Laboratories financial challenges leading it to lay off people and reduce its investment in product development.*

*“India Health Fund played a pivotal role as it gave us the necessary support to continue even during the pandemic. It has also been a turning point where we have now started to gain customers and are seeing revenues come in.” — Dr. Sudeshna Adak*

## Stellar Diagnostics:

### Novel triaging tool to diagnose TB within 20 minutes

Dr. Suman Laal shares that women can handle multiple tasks and responsibilities simultaneously, plan forward, and adapt to different situations, making them valuable members of scientific teams. She opines that a change in social mindset, an inclusive environment, availability of networking opportunities and a strong family support system are key to ensuring that women are successful. During her career as a scientist in the US and India, she came across the harsh realities of the lack of resources and healthcare infrastructure for TB diagnosis and treatment. She realised that the first-world cutting-edge TB research and technology available in the US needed to be made available as a product to the TB-endemic parts of the world.

Currently, India spends a huge amount of resources testing suspected TB patients every year to

identify the confirmed cases. Conventional methods for diagnosing TB are not very accurate and can take weeks to produce results. On the other hand, accurate culture and molecular TB confirmatory tests are time-consuming, expensive and cannot be used for screening all suspected TB patients. Also, the available diagnostic tools can fail to identify patients with low bacterial burden and result in millions of missed cases annually. Stellar Diagnostics India Private Limited (SDIL), co-founded by Dr. Suman Laal is developing **an accurate, point-of-care biomarker and antigen test to enable rapid triage of potential TB patients**. The test, which is supported by IHF has the potential to narrow the number of TB suspects that need to be referred for confirmatory testing and can be carried out without the need for laboratory equipment.

## Features of Stellar Diagnostics solution:

- Identifies presumptive TB patients within 20 minutes for further confirmatory diagnosis
- Allows affordable testing at a target cost of under \$1.7 per test
- Improves test accuracy targeting 90% sensitivity and 72% specificity through field trials
- Reduces the number of avoidable expensive molecular diagnostic tests conducted for presumptive TB cases

## IHF is supporting Stellar Diagnostics in:

- The development and validation of the test for regulatory approval and inclusion in the National TB Eliminate Programme
- Improving the test performance to meet optimal requirements for regulatory approval by World Health Organisation
- Adaptation of the test to work with a finger-prick derived drop of blood and initiation of field trials in collaboration with the National TB Diagnostic Consortium.

*Stellar Diagnostics faced challenges in securing funding in India for the final stages of translating the TB peptides from academic research into a format that could be used by patients at all levels and finding a partner that could provide manufacturing and marketing support. “Not only has IHF provided us with additional funds when they were most needed, but they also supported us with networking opportunities advice and regular reviews. Their understanding of the TB ecosystem in India and their consistent positive and pragmatic support have brought a lot of clarity on strategic approaches that could expedite dealing with the challenges in this venture.” — Dr. Suman Laal*

## Hemex Health - Gazelle:

### Rapid and accurate diagnostic test for malaria in one minute

Being a woman leader in technology, Ms. Patti White often found herself in the minority. She worked to create diverse teams that were motivated to use technology to improve the lives of people all around the world. Ms. White cites research that shows that women are rated better than men in leadership skills<sup>4</sup> such as taking initiative, acting with resilience, displaying high integrity and honesty, and believes that these characteristics help create effective teams that produce scientific breakthroughs.

While working in the medical technology industry in the US, Ms. White saw that the diagnostic technologies being developed in US university laboratories did not reach developing countries like India.

India carries 2% of the global malaria case burden and 2% of global malaria deaths.<sup>5</sup> The country

is affected by two types of malaria parasites: Plasmodium falciparum (Pf) and Plasmodium vivax (Pv). The lack of an accurate and quick diagnostic test for malaria can delay the diagnosis of patients and result even in mortality. Malaria cases can also be missed due to genetic mutations.

Through the collaboration of diverse teams in India and the US, Hemex Health, co-founded by Ms. Patti White is developing **Gazelle — a one-minute, bivalent, accurate, rapid diagnostic test for malaria**. It works on a simpler principle of detecting Hemozoin, a metabolic by-product formed due to malaria infections. The device uses a single blood sample to detect the presence of both Pf and Pv parasites in just a minute. The widespread adoption of Gazelle can potentially result in early detection and treatment initiation with reduced mortality.

### **Features of Gazelle solution:**

- **Tests malaria in one minute**
- **Uses an automated cartridge that measures samples and mixes diluent**
- **Detects more Pv malaria than RDTs verified in multiple global studies**
- **Enables automated data capture and transmission of case-patient details to the malaria surveillance system resulting in case details getting reported in real-time**
- **Fills a gap in the availability of an affordable, accurate and accessible rapid test for malaria**
- **The targeted cost per test is at \$1**

### **IHF is supporting Hemex Health in:**

- **Validating the device in clinical trials to determine its accuracy for malaria diagnosis and species differentiation when compared with rapid diagnostic tests (RDTs), microscopy and polymerase chain reaction (PCR)**
- **Evaluating the algorithm in comparison with PCR and other tests.**

*Because of the pandemic over the last 2 years, Hemex Health had to stop collecting data, delay the project and was unable to come to India directly.*

*“Despite the issues caused by the pandemic, IHF stayed with us, kept us focused on the goal, and that made a big difference. IHF has helped us continue the momentum and development of our malaria technology. They have connected us with many of India’s top leaders and advisors in malaria. I also appreciate the IHF team which has some very capable women leaders. The team helped us to better understand the system in India.”*

*- Ms. Patti White*



## HealSeq:

### Accurate molecular test to diagnose Drug-Resistant Tuberculosis (DR TB)

Dr. Nagasuma Chandra considers her curiosity for learning science, working on leading-edge technologies, producing research, and guiding PhD students as some of the milestones in her journey as a women scientist. She believes that women can contribute profoundly to the exciting and rapidly changing fields of science and technology that have unprecedented opportunities.

Currently, the standard treatment for TB typically lasts for about 6 to 9 months. However, some patients do not respond to this first line of treatment as the TB bacteria become resistant to the standard treatment. Therefore, the efficacy of the standard treatment must be recognised as soon as possible and switched to a second-line treatment.

Current molecular methods detect DR TB before treatment initiation by identifying known drug-resistant

mutations in the pathogen but may miss the other possible causes of DR TB. The effectiveness of the treatment for TB is realised about 4 months following its initiation. This leads to late diagnosis and is one of the key reasons for the increase in the incidence of DR TB disease. In the last 2 years, about 0.11 million people were detected with DR TB with fatalities accounting for about 20% of the detected patients<sup>6</sup>

HealSeq was co-founded by Dr. Nagasuma Chandra and is developing a **breakthrough biomarker-based blood test aimed at significantly speeding the treatment of DR TB by reducing the time to diagnose drug resistance from 4 months to 2 weeks.** This test, supported by IHF could help patients get started on their treatment faster and prevent the spread of the disease.

### **Features of HealSeq solution:**

- **An accurate, low-cost, easy to administer test that can identify DR TB early and guide the fast clinical decision to shift to second-line therapies**
- **Ensures effective DR TB treatment by reducing the time to diagnose drug resistance to 2 weeks.**
- **Is approximately 1/6th of the cumulative cost of the multiple tests that need to be taken during the TB treatment course**
- **Can be administered using a simple RT-PCR kit**

### **IHF is supporting HealSeq in:**

- **Setting up uniplex assays on pilot samples**
- **Development of multiplex assays for performance optimisation and indigenisation for cost reduction**
- **RTPCR testing of 500 samples in 5 hospitals, and kit production for third party validation**
- **Connecting with The Indian Council of Medical Research for third party validation**

*HealSeq's challenges have included competing for funding, lack of infrastructure, and capitalising on grants and fellowships.*

*"India Health Fund's support to HealSeq came at a very crucial time as we began validating blood-based host biomarkers for TB. We made an application to IHF for a grant to develop biomarkers for TB. They guided us into applying for this grant enabling the team to start working on the project. Since the IHF support includes not just funding, but also efforts in hand-holding, monitoring, mentoring, and integrating the company into the healthcare ecosystem, it will make a major difference to HealSeq's work in TB." - Dr. Nagasuma Chandra*

## CisGEN Biotech Discoveries: Quick and accurate diagnosis of Bovine TB to control the animal to human transmission

Dr. V. Maroudam believes that scientific discoveries need creativity and imagination and that these skills are not gendered-biased. Increased participation of women scientists in leading national institutes will enable higher contributions to research grants, honours and publications, which will help propel scientific progress.

After advanced degrees in veterinary, a PhD in Biotechnology and more than 17 years of experience in veterinary diagnostics and vaccine development, Dr. Maroudam found that India needed novel products and services for animal health.

Bovine TB, an infectious disease of cattle represents the 7th largest zoonotic (disease transmitted from animals to humans) threat to

humans. It currently takes a veterinary doctor about 4 days and 2 visits to diagnose bovine TB in cattle, making it expensive, time-consuming, and difficult to arrest the spread to humans.

CisGEN Biotech Discoveries Private Limited founded by Dr. V. Maroudam is developing an **innovative technological kit to detect bovine TB using a combination of native and recombinant antigens**. The kit helps distinguish between Mycobacterium TB infection and environmental mycobacteria infection. With the support of IHF, the CisGEN kit could potentially help reduce zoonosis of TB through a quick, accurate and cost-effective detection of the disease.

### **Features of CisGen solution:**

- **Has the potential to reduce zoonosis of TB and false positives and negatives by a significant proportion in endemic areas**
- **Is 7x times cheaper and cost-effective at approximately \$0.7 per tested animal**
- **Provides results in 10 minutes and is more accurate than the tests that are currently in use**
- **Can be deployed by healthcare workers with minimal expertise**

### **IHF is supporting CisGen in:**

- **Upscaling candidate TB antigens and reagents**
- **Development of gold conjugated detection reagents**
- **Manufacturing and validating the point-of-care animal TB alert kit**

*CisGEN Biotech competed for funds in a market that did not have specific animal sector funding. While developing a commercial prototype, CisGen had to deal with the challenges of complex regulatory requirements, the small market size for animal products, the lack of capability to reach the market with new technology, and low awareness in the animal market.*

*“India Health Fund helped me financially in upscaling and in the validation of our animal healthcare product. IHF also provided us with the required technical and network support and mentored us into having a business portfolio for our products.” - Dr. V. Maroudam*

# Call for innovations led by women scientists and entrepreneurs

If you are working on an innovation that has the potential to make a difference in the diagnosis, treatment, and prevention of communicable diseases by getting entrenched in the public health system in India, please reach out to IHF at [contact@indiahealthfund.org](mailto:contact@indiahealthfund.org)

[Know more here](#)

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We, at IHF would love to hear your thoughts and feedback. Please do send us an email at [contact@indiahealthfund.org](mailto:contact@indiahealthfund.org)



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