

## RBI Study of State budgets disproves Congress claims on Telangana's fiscal condition

Hyderabad: Telangana's fiscal condition became one of the most debated issues recently, amid the Congress government's repeated claims that the BRS left the State in tatters. The Congress also expressed its inability to take up any major development programmes, allegedly because as most of the funds were being spent to "repay the debts" under the BRS regime.

However, notwithstanding political mudslinging, data proves that Telangana, under the BRS government, was a top performer in fiscal prudence and development expenditure. The Study of State budgets released by Reserve Bank of India (RBI) from 2014-15 to 2021-22 shows Telangana leading the nation in Compound Annual Growth Rate (CAGR) for development expenditure, recording an impressive 15.9 per cent, which is 5.81 per cent higher than the national average. After Telangana, Arunachal Pradesh posted a CAGR of 13.75 per cent, with Assam and Karnataka posting 11.96 per cent and 11.56 per cent respectively. Andhra Pradesh ranked lowest, registering a

CAGR of development with just 2.84 per cent. Telangana had topped the charts for two consecutive years in terms of the percentage of the State budget spent for development purposes. According to recent RBI reports, the State spent 77.4 per cent of its total budget to development in 2022-23 and 76.3 per cent in 2021-22. In 2020-21, Telangana spent 69.7 per cent on development, ranking third nationally, after Delhi and Arunachal Pradesh. In absolute terms, Telangana was ranked fifth in development expenditure, spending Rs.1.98 lakh crore out of a total Rs 2.56 lakh crore in 2022-23.

The States ahead of Telangana – Uttar Pradesh, Maharashtra, Tamil Nadu, and Rajasthan – are much larger in population and geographic area. Despite fiscal constraints imposed by the Centre during the period, Telangana's impressive performance was attributed to its strong growth in State's Own Tax Revenue (SOTR). Telangana's SOTR grew by 18.3 per cent annually from Rs.29,288 crore in 2014-15 to Rs.1,12,004 crore in 2022-23, marking an increase of over 280 per cent. The State



ranked second in SOTR collection efficiency, with 84.2 per cent, just behind Haryana. What is development expenditure: This refers to government spending aimed at boosting social and

economic growth, including infrastructure projects such as roads, hospitals, schools, airports, and other long-term investments in key sectors like agriculture, health, and education.

## Secunderabad temple vandalism: Suspect identified, found to be involved in similar cases



Hyderabad: The suspect in temple desecration at Kummarguda in Secunderabad has been identified as Salman Salim Thakur alias Salman (30) of Maharashtra who had come to the city a month ago to attend a personality development workshop. According to the Hyderabad Police investigating the case, the suspect was influenced by speeches of Islamic speakers online and developed a radical mindset towards other communities. Salman, who belonged to

Mumbra in Maharashtra, is a Computer Engineering graduate and active on social media. He allegedly started watching religious preachers videos like fugitive Zakir Naik and others on Facebook and YouTube and got influenced. The police said he became self-radicalised and developed a radical bent mind and hatred towards the practices of other religions.

Initial investigation has revealed that the miscreant came to Hyderabad in the first week of October to attend a month-

long personality development workshop organised by English House Academy under Munawar Zama, Mohd. Kafeel Ahmed and others at a hotel located in Rezimental Bazar. The police found the hotel premises was rented illegally for running the academic course and had no formal permission. Officials said necessary legal action was being taken against the hotel management for the same. Earlier involved in similar cases: The police investigations also revealed that the suspect was involved in similar incidents earlier in

Mumbai. While in 2022, he entered into a Ganesh pandal with his footwear and argued with local resident mocking the practice of idolatry, in 2024, he trespassed into a temple and vandalised the idol at Mira Road. Police officials requested citizens to avoid rumour mongering and speculation on the incident as the case was still under investigation. In the early early hours of October 14, the suspect entered into the sanctum-sanctorum of the temple and desecrated the main idol. The Monda Market police are investigating.

## Telangana High Court orders four IAS officers to join duties in AP

Hyderabad: The Division Bench of the Telangana High Court, comprising Justice Abhinandan Kumar Shavili and Justice Laxmi Narayana Alishetty, dismissed a batch of writ petitions filed by IAS officers seeking to remain in their current postings until their applications were resolved by the Central Administrative Tribunal (CAT).

The court emphasized the need for the officers to adhere to the Department of Personnel and Training (DoPT) orders issued on October 9, which directed them to

report to Andhra Pradesh by October 16. The officers, including Ronald Rose, Vani Prasad, Amrapali Katta, and Karuna Vakati — originally allocated to Andhra Pradesh but currently working in Telangana — were among those affected. Conversely, Hari Kiran, Srijana Gummala, and Siva Sankar Loheti, initially assigned to Telangana but working in Andhra Pradesh, were also ordered to report to Telangana. The IAS officers had approached CAT on Tuesday, but the tribunal did not grant any interim relief and scheduled a hearing for November 4.

# Pawan Kalyan and the changing shades of white, grey and saffron

In June, soon after he was sworn in as Deputy Chief Minister of Andhra Pradesh, actor-turned-politician Pawan Kalyan made a special request to Prime Minister Narendra Modi who was on the star-studded dais. Walking past CM Chandrababu Naidu and his son and minister Nara Lokesh, Modi and Kalyan headed towards a beaming Chiranjeevi – Telugu mega star and Kalyan's brother. The three then held hands and raised them, facing a cheering crowd of onlookers. In retrospect, that moment stands out – in the four months since then, the 'Power Star', as Kalyan is known in film circles, has traded his white attire for shades of saffron. On October 3, dressed similarly, he declared to a crowd at Tirupati, "I am a Sanatani Hindu", and pledged to sacrifice his life for the religion.

While his supporters cheered his hour-long speech – where he switched between Tamil, English and Telugu – his critics point out that up until five years ago, Pawan Kalyan was a "Che Guevara fan". His Jana Sena Party (JSP), which he founded in 2014, was then in an alliance with the Left and BSP. With his fans urging him to play the role of Che Guevara, Kalyan would speak what political observer Ramesh Kandula calls "Marxist jargon". While JSP insiders admit a change from that, they insist at least one part of Kalyan hasn't changed over three decades – he has, they say, remained a champion of the Telugu middle class. "He has experienced middle class life and its tribulations. His early years have shaped him," Ajay Kumar, JSP spokesperson, told The Indian Express. Kalyan was born in 1971 to a Prohibition and Excise Department official of the then united Andhra government, Konidala Venkata Rao, and Anjana Devi. A turning point in the lives of this middle-class family would be when Chiranjeevi, Kalyan's eldest brother, made it big in the film industry. Chiranjeevi's stardom also catapulted his brothers Nagendra Babu and Kalyan, the youngest, onto the silver screen. But Kalyan chose his films – about 25 of them – carefully. "In his films, he was always the underdog who rose to save the day. Alongside, he built a vibrant and outspoken personality which attracted especially the young," a Telugu film critic who did not want to be named says. Kalyan's political entry appears to have been as planned. In 2008, he floated 'Common Man Protection Force', which was largely a platform for his fans. But its formation coincided with Chiranjeevi making a political entry with his Praja Rajyam Party (PRP). Kalyan later helmed the youth wing of the PRP.

But the PRP did not make much of a dent in Andhra politics and later merged with the Congress. "Kalyan was not a supporter of the Congress and he stayed away," says Ajay Kumar. In 2014, the same year as the Congress-led UPA government went through with the bifurcation of Andhra, Kalyan launched his own political party –



the JSP. His anti-Congressism meant "he was one of the first celebrities to support Narendra Modi", Kumar says. JSP insiders say that at this time, Kalyan also supported the TDP, but in 2019, when Naidu's party joined hands with the Congress, he decided to support the Left. Both the TDP and the JSP, however, failed to make a dent in the 2019 polls, with the YSR Congress Party sweeping both the Assembly and Lok Sabha elections in the state. Kalyan lost both the seats he contested from. Ahead of the 2024 polls, Kalyan took another U-turn and was instrumental in bringing together the BJP and TDP. JSP insiders say that even at a time when YSR chief Jagan Mohan Reddy and his welfare measures were being touted as a winning ticket, Kalyan was sure an NDA alliance could oust the YSRCP from power.

As Kalyan now veering seemingly even more to the right, especially in light of the Tirupati controversy, a source attributes it the JSP leader's astuteness in gauging that the state has not yet seen a consolidation of Hindu votes in favour of the BJP – and spotting an opportunity in it for himself. "Kalyan knows that he is the right person to capitalise on the Hindu sentiment, in a way Chandrababu Naidu cannot, because of his 'secular' credentials," a source says. Apart from declaring himself a true

Sanatani Hindu, Kalyan has spoken about "unification of Hindus", as well as expressed concern about "desecration of temples and idols", "dilution of rituals and traditions", and "attack on the Hindu way of life". "You may hate Modi but do not talk negatively about the Ayodhya Temple or Lord Shri Ram," he has said. Some compare what Kalyan is attempting to what B S Yediyurappa did in Karnataka. "Yediyurappa had a south Indian version of Hindutva where he did caste engineering and also batted for a Hindu way of life," a source from Vijayawada points out.

Those in the JSP are also at pains to point out that Kalyan's definition of Sanatana Dharma is distinct from the BJP's. Party leader Dr P Hari Prasad says Kalyan has always been a religious person. "He has been undertaking fasts and deekshas since childhood... It is not that he has suddenly become a champion of Sanatana Dharma... And Pawan Kalyan respects all religions. If a mosque or a church invites him, he goes too. He is of the opinion that people should show the same respect to Hinduism." Adds TDP leader Anam Venkat Reddy: "Lord Balaji holds a very special place in the lives of Telugu people. He is an emotion. Pawan Kalyan, like Chandrababu Naidu, feels very strongly about the entire (Tirupati)

controversy." Sources in both the JSP and TDP also believe that Kalyan's Sanatana Dharma remarks, including his attack on DMK leader Udhayanidhi as a part of them, could see him help the BJP and AIADMK get back together in Tamil Nadu. "Taking a jibe at DMK chief M K Stalin's son for his remarks on Sanatana Dharma definitely looks like the start of something," a JSP leader says. While Kalyan could not be reached despite several attempts, other JSP insiders say his new persona post the laddoo row in Tirupati is also partly because the Deputy CM has been on "deeksha" since he took office.

"He is wearing saffron because he was first on a chaturmasa (four-month) deeksha. Later, after the laddoo controversy broke, he took up penance and wore saffron," says a party leader. His teeming fans and supporters across south India are, for one, convinced he is on the right path – one that will lead Kalyan right to the CM's post. "We worked so much for the JSP during the 2024 elections and will not rest till the 'Power Star' becomes CM," says Murali Gowda, the president of the Power Star Pawan Kalyan Fans' Association in Karnataka. There is a significant obstacle though in these ambitions: Old Andhra Pradesh warhorse Naidu's own aspirations regarding son Nara Lokesh.



# Asia Prime Media to host Global Tourism Awards on 19th October

Asia Prime Media is set to host the prestigious Global Tourism Awards on 19th October 2024 at the Hotel Taj Deccan, Hyderabad. The awards ceremony aims to celebrate excellence and innovation in the global tourism industry and will feature Mr. Jupally Krishna Rao, Minister for Tourism, Telangana, as the chief guest. Asia Prime Media Research and Network, a research-driven organization offering sophisticated market intelligence, cutting-edge media strategies, esteemed awards programs, and premium consulting services, Founded by Munnuswamy Jayaraman and led by Divya Jayaraman, the Chief Executive Officer.

Reflecting on the importance of this event, Divya Jayaraman stated, "The Global Tourism Awards serves as a platform to acknowledge and celebrate the outstanding contributions of individuals and organizations in the tourism sector. We are

honored to welcome distinguished nominees and stakeholders who are passionate about driving the industry towards innovation and sustainability."

This year's awards attracted over 2,500 nominations from countries around the world, with notable entries from South Asia, including Thailand, Singapore, Malaysia, Nepal, Lakshadweep, and the Maldives. The event will honor the top 30 entities that have made exceptional contributions to the tourism sector. The Global Tourism Awards will be evaluated by a panel of esteemed jury members, including Dr. Syed Anwar Kabir, Director and Editor of Scholars Retreat; Smt. Bashyakarla Sailaja, Former Executive Administrative Aide to the Commissioner of Telangana State; and Thirmurthy OD, an alumnus of IIT Kharagpur. Their diverse backgrounds and vast experience in the industry will ensure a rigorous and fair se-



lection process, highlighting the most deserving contributors to the tourism sector. The Global Tourism Awards aims to spotlight and encourage innovation, sustainability, and leadership in the tour-

ism industry worldwide. Asia Prime Media is committed to recognizing the exemplary efforts and accomplishments of those who contribute to the sector's growth and success.

## HDFC Bank holds State-wide Public Awareness Campaign (PAC) on acceptance of 10 coins in Telangana



We understand your world

HDFC Bank, India's leading private bank, organised a state-wide two-day Public Awareness Campaign (PAC) on acceptance of ₹10 coins through our 430 branches and 542 BCs spread across 33

districts in Telangana. The purpose of the PAC was to alleviate the misunderstanding around legal validity of ₹10 coins and help foster greater trust & confidence in ₹10 coins. This initiative was taken forward in

coordination with Reserve Bank of India, Hyderabad. The Bank has distributed/exchanged ₹10 coins worth a total of Rs 10.96 lakhs during this Campaign, the first of which took place in Telangana State. ₹10 coins worth Rs 16.90 lakh have been distributed/exchanged during the past year.

Apart from disseminating public awareness through Posters/ Banners/ collaterals/ Pamphlets at Prominent market areas/ Rythu Bazar and local markets etc., Live display on our Branch Digital Led Screens and ATMs have also been used extensively for effective public awareness in this campaign. Different types of customers like retailers/Traders/Road Transport/PMSvanidhi beneficiaries/Small business/

Kirana stores etc. availed the benefits through this awareness campaign. They secured small change for transacting, which is an important requirement particularly in the smaller towns and cities. The coins were distributed in the presence of Cluster Heads through branches.

Speaking on the occasion Sri Venkatesh Challawar, Executive Vice President & Regional Head, said, "We are very happy that we could hold this initiative across so many cities in the state. These Public Awareness Campaign (PAC) on acceptance of ₹10 coins will reinforce usage of coins in daily transactions and circulation at large. We thank the RBI for their guidance and support of this initiative"

## Apple researchers doubt AI's mathematical reasoning ability

New Delhi: A team of Apple researchers has questioned the formal reasoning capabilities of large language models (LLMs), particularly in mathematics. They found that LLMs exhibit noticeable variance when responding to different instantiations of the same question. Literature suggests that the reasoning process in LLMs is probabilistic pattern-matching rather than formal reasoning. Although LLMs can match more abstract reasoning patterns, they fall short of true logical reasoning. Small changes in input tokens can drastically alter model outputs, indicating a strong token bias and suggesting that these models are highly sensitive and fragile. "Additionally, in tasks requiring the correct selection of multiple

tokens, the probability of arriving at an accurate answer decreases exponentially with the number of tokens or steps involved, underscoring their inherent unreliability in complex reasoning scenarios," said Apple researchers in their paper titled "GSM-Symbolic: Understanding the Limitations of Mathematical Reasoning in Large Language Models." The 'GSM8K' benchmark is widely used to assess the mathematical reasoning of models on grade-school level questions. While the performance of LLMs on GSM8K has significantly improved in recent years, it remains unclear whether their mathematical reasoning capabilities have genuinely advanced, raising questions about the reliability of the reported metrics





# Sukumar Das has recently captured the world's attention by flying a paramotor adorned with the Indian flag over the majestic Giza Pyramids in Egypt

Sukumar has traveled extensively, with journeys to Thailand, Laos, Egypt, Brazil, Nepal, and various regions across India. His mission is clear: to promote paramotoring and paragliding while highlighting the joys and benefits of being an aero sports pilot. With each flight, he aims to inspire others to explore the skies.

In addition to his aerial pursuits, Sukumar is passionate about integrating aero sports with cultural events. He actively participates in celebrations like Bathukamma, Mysore Dussehra, and Telangana Formation Day, linking these festivals to tourism and sports. "These events not only promote culture but also highlight the beauty of aerial sports," he explains. Sukumar's journey has not been without its challenges. "I faced financial difficulties while flying in different countries," he reveals. To support his passion, he taught freelance classes, saving diligently to represent India abroad. Born on August 15, he embodies the spirit of independence and resilience in every flight.

Looking to the future, Sukumar is launching a startup called Vertical World, aimed at inspiring young people to pursue careers in aero sports. "I want to serve my nation by training young pilots who can represent India on the global stage," he declares, emphasizing the potential for a successful career in this thrilling field. Having represented India in the World Championship in Brazil, Sukumar dreams of organizing similar events in India, pro-



vided he receives the necessary support. "I've hosted pilots from around the world in Telangana, and I would love to showcase

Indian talent on a grander platform," he states passionately. Through his unwavering dedication, Sukumar Das is not just fly-

ing high—he's inspiring a new generation to reach for the skies while proudly carrying the Indian flag.

## Coastal flooding harms different tree species differently: study

Global warming is raising sea levels and making flooding more common in some areas. Researchers have held both these effects among others responsible for discouraging the growth of plants of many tree species in coastal areas. But a new study by researchers at Drexel University in Philadelphia and the Northern University of Arizona has called for a pause in this thinking. The study paper, published in the journal *Frontiers in Forests and Global Change* on August 28, has reported that a rising sea and coastal flooding could actually enhance the resilience of some coastal tree species while being detrimental to others. Trees respond quickly. How well trees grow in a place depends on the place's ambient temperature, average rainfall, soil health, access to water with the appropriate qualities, and the location of other vegetation nearby, among other factors. Trees can respond fairly quickly to these changes, too. For example, even as sea levels are rising by a few millimetres a year, many species of coastal trees have started to move further inland, where the tides are lower and the salinity more tolerable — but also where other conditions may be more inhospitable. The study's authors LeeAnn Haaf and Salli F. Dymond previously studied coastal forests in the

Delaware Bay in the U.S. state of Delaware and the Barnegat Bay in New Jersey. In a paper published in 2021, they reported that different plant species here responded differently when exposed to rising seas and repeated coastal flooding. "In our recent study, we found species- and site-specific patterns related to sea level rise, temperature, and precipitation pattern (associated to tree growth) and that also extends to how those factors change with climate change," Haaf, an environmental scientist at Drexel University, said.

One species in particular, the American holly (*Ilex opaca*), responded to more water in its surroundings by increasing the rate at which it grew — while loblolly pine (*Pinus taeda*) and pitch pine (*Pinus rigida*) trees suffered under higher water levels. Tracking the rings

In the new study, Haaf and Dymond used a method called dendrochronology to understand how trees grew in response to specific conditions. In dendrochronology, scientists estimate when a tree formed a particular tree ring, and based on that develop a time-wise correlation between a climatic condition and the tree's response. They wrote in their paper that they compared changes in "environmental con-

ditions" to the growth of American holly, loblolly pine, and pitch pine trees in the Delaware and Barnegat Bays. They also used "gradient boosted linear regression, a machine-learning approach, ... to investigate tree growth responses across gradients in temperature, precipitation, and tidal water levels." In this way, Haaf and Dymond assessed whether tree rings became larger or smaller as each natural condition varied over time. Gradient-boosted linear regression The tree rings consist of water vessels. When a tree is exposed to a lot of rain along with appropriate levels of sunlight and ambient temperature, it also develops more water vessels. But a heavy downpour and a deluge would disrupt this process altogether and prevent the plant from growing normally. So thicker rings signify abundant tree growth while thinner ones mean stunted growth. And because older rings remain at the centre of the tree trunk and newer ones near the periphery, dendrochronology can help provide timestamps for climatic conditions in the past. Gradient-boosted linear regression is a machine-learning model used to understand patterns in tree rings. It helps by estimating the effects of a combination of forces acting on a system. Such problems are too complicated for techniques like a

correlation test that indicate how closely the changes in the values of only two variables are related and overlook interactions between variables that cause other effects. Pratik Karmakar, a computer science researcher at the National University of Singapore who wasn't involved in the study, said "the gradient boosted linear regression model of machine learning is an appropriate method used in this study".

While the data are specific to the mid-Atlantic region, the "methods would certainly work in any temperature location in the world," Haaf said. She added that the correlation with temperature, precipitation, and sea level may not be significant everywhere — "but I think that is part of understanding how at-risk forests are." Sea-level rise accelerating Sea levels were increasing by around 2 mm/year in 1993. This rate has since doubled and climate researchers expect floods in coastal areas will increase threefold by 2050 and the average number of days of flooding will increase twofold. Haaf continued, "Our study can help forest managers understand how at-risk a coastal forest is to tidal flooding by inventorying what species are there and considering other conditions specific to that site." For example, some temperate coastal forests are predominantly loblolly. "



# Studies zero in on biology TB bacteria use to evade immune response

Tuberculosis (TB) is a major focus in India's healthcare goals. The country is steadily improving its ability to diagnose and track TB patients and help them adhere to the long course of antibiotics required to treat it. But with increasing antimicrobial resistance in *Mycobacterium tuberculosis* (Mtb), the pathogen that causes TB, many existing antibiotics aren't working as effectively to kill it. So researchers are studying Mtb to identify its important proteins and then design new drugs that can act against them. A companion over millennia. This is not an easy problem to solve. The pathogen has co-evolved with humans for millennia. Researchers have found the Mtb complex was present as long as 70,000 years ago. Such a long relationship between the two species has allowed the microbe ample time to evolve and trick the human immune system in many ways.

One of them is its ability to grow in macrophages. The first line of human immune cells that destroy many other invading microorganisms are actually Mtb's home. Macrophages are designed to engulf foreign particles, including microbes. They can initiate a plethora of chemical reactions involving peroxides, free radicals, and other compounds that break down the engulfed particle or microbe. These reactions often collectively induce a state called oxidative stress and alter the chemical nature of molecules, including the DNA, the RNA, and/or the proteins of life-forms, rendering them dysfunctional or even literally broken up. Macrophages also use diverse strategies to starve the engulfed microbes of essential nutrients, eventually killing them. But these techniques don't work against Mtb. Mtb keeps itself protected in clusters called tubercles (hence the name of the disease) surrounded by lipids (fatty substances) in the lungs. Though it's a respiratory pathogen, it has been known to spread to various other tissues. It can also stay dormant in the cells for a long time, up to a few decades, without causing disease or spreading to other people.

Enzymes of particular interest. Researchers believe Mtb's many survival abilities are a result of its large genome, consisting of 4.4 million base pairs. To compare, the respiratory bacteria *Staphylococcus aureus* has 2.8 million base pairs and *Streptococcus pneumoniae*, 1.9 million to 2.7 million. A larger genome means more proteins. Scientists are yet to understand the role of many Mtb proteins — but they believe Mtb's genetic and protein machinery allows it to lead an independent life once it finds a home inside the macrophages. Scientists are intrigued by whatever allows Mtb to survive and persist in the macrophage's hostile environment and are on the lookout for proteins that shield it. One category of proteins called the cysteine synthase enzymes is of particular interest. They help cells synthesise cysteine, a sulphur-containing amino acid. Cells use cysteine to make antioxidants, whereby the sulphur disrupts the reactions that cause oxidative stress.

Where there's a Cys, there's a way. A study published on August 29 in the journal *eLife* by researchers at the CSIR-Cen-



tre for Cellular and Molecular Biology (CCMB), Hyderabad, explored the role of different cysteine synthases in Mtb. The researchers grew Mtb in a bacterial growth medium and restricted its access to nutrients. Then they created oxidative stress conditions in the dish (by adding certain compounds) and looked for genes whose expression patterns changed as a result. This is how they found Mtb's cysteine synthase genes are expressed more during oxidative stress.

Mtb has at least three cysteine synthase enzymes. They make cysteine in cells through different chemical reactions. The scientists found that two of the enzymes, called CysK2 and CysM, significantly influenced the microbe's survival during nutritional deficiency and oxidative stress. They also found Mtb's ability to produce various antioxidants was impaired when the researchers knocked out the genes used to make either of the two synthases. It is nearly impossible to get human lung tissue to infect for an experiment. Instead, the researchers infected mice with the wild-type Mtb and mutant Mtb. After allowing the bacteria time to infect the mice and for the mice immune systems to respond, they measured the amount of bacteria in the two groups. They found the wild-type Mtb survived better in the mice than the mutant Mtb. They also found similar effects when they infected just macrophages from the lungs and the spleen. (The spleen is the first organ after the lungs organ Mtb infects, by moving through the bloodstream.) When the research team checked the pathogen's survival in mice mutated to not develop oxidative stress, they found it didn't matter if Mtb had the cysteine synthases. That is, Mtb with and without the cysteine synthases grew equally well in such mice.

Undermining Mtb's survival. A study in 2017 by researchers at the Karolinska Institute, Stockholm, had reported a list of 71

compounds that could inhibit the cysteine synthases. Researchers at Vinay Nandicoori's lab at CCMB tested these compounds against Mtb and found they all inhibited Mtb to some extent. Fortunately, these inhibitors also made isoniazid, a known bacteria-killing drug, more potent against Mtb and together made for a strong antibiotic cocktail. Humans don't have cysteine synthase enzymes, so these inhibitors could be promising targets for new antibiotics. The study was conducted together with Luiz Pedro Sorio de Carvalho's lab at the Francis Crick Institute, London.

In addition to cysteine synthases, scientists around the world are studying other ways Mtb survives the macrophage environment. For example, they are examining the roles of phosphates and carbon metabolism, which are central to Mtb's life-cycle. Some are exploring how Mtb develops a cell wall strong enough to withstand oxidative stress. Some groups are unearthing details about how Mtb stops the production of molecules that lead to oxidative stress; trick a host macrophage into secreting damage-repair molecules (which mac-

rophages produce to protect and revive immune cells from oxidative stress) sooner; or stay in the macrophages without activating its immune responses.

Through many doors at once. Some interesting new studies have also revealed how the bacteria erase the epigenetic memory of macrophages, i.e. healthy macrophages' ability to make chemical changes to their genomes and pass it on to their daughter cells. This ability allows the new cells to identify an ongoing or a past infection and get rid of it faster. Without this memory, newly formed macrophages aren't preconditioned to face an Mtb infection. All these studies are together demystifying Mtb, like keeping many doors open through which to chase out the TB menace. For these possibilities to actually translate into treatments in the market, there are many unfulfilled steps — including finding ways to perform these studies with human cells — and India needs to focus on them. Somdatta Karak, PhD is the head, Science Communication and Public Outreach, CSIR-Centre for Cellular and Molecular Biology, Hyderabad.

## Northeast monsoon turns active in Hyderabad, light rains expected over next two days

Hyderabad: The northeast monsoon has become active over Hyderabad, with light rains expected across the city over the next two days, according to the Telangana State Development Planning Society (TSDPS).

Most parts of the city are forecast to receive light rainfall on Thursday, with the exception of localities such as Charminar, Bandlaguda, Ramachandrapuram, and

Serilingampally, where rains are expected to be negligible. By Friday, no major rainfall is anticipated, according to the forecast.

On Wednesday, the city experienced scattered intense storms in areas including Miyapur, Gajularamaram, Jeedimetla, and Patancheru.

Meanwhile, across the state, other districts are also expected to receive light rains on Thursday, with moderate rainfall forecasted in Jogulamba Gadwal district.



# All about precision therapy, and how it can help reduce cancer-related mortality by up to 98%

Tanisha (name changed) a 31-year-old professional living away from home in Bengaluru, led a busy life with little time for recreation. One day, she discovered a lump in her breast. She was diagnosed with breast cancer. While surgery successfully removed the tumour, the possibility of needing chemotherapy loomed large. However, her doctor recommended tests to determine her "recurrence score," and the results indicated that chemotherapy was not required in her case. Today, Tanisha has fully recovered and is back to her professional life. "Many recurrence scores are now available and approved for breast cancer," said Dr Sachin Sekhar Biswal, consultant medical oncologist at Manipal Hospital Bhubaneswar. "These tests analyse genes and assess the risk of recurrence using different molecular methods. This is truly the era of personalised medicine."

What is precision medicine?

Precision medicine, also called personalised medicine, traditionally used in advanced stages of cancer, now plays a key role even in early stages. "Early-stage cancers often have a better prognosis when detected and treated promptly. Precision therapy involves identifying specific genetic mutations in tumours, allowing doctors to choose targeted treatments that may be more effective than standard therapies. This approach can improve outcomes and reduce unnecessary side effects," said Dr Mukesh Patekar, unit head, medical oncology at Artemis Hospitals. From infectious diseases to once-pathology, hematology, medical geneticists, and medical oncology, Dr Biswal listed some of the branches where its role is "tremendous," considering India has been named the cancer capital of the world. "The research in the field of oncology has led to a boost in ongoing research, and it's also being translated into patient care," said Dr Biswal.

What is the procedure?

The process begins with diagnostic tests, such as biopsies, where a tumour sample is analysed for genetic markers. A pathologist reviews the sample, determines its nature and adequacy, and prepares it for molecular analysis. "With new, advanced testing, even smaller samples are sufficient for analysis. Next-Generation Sequencing (NGS) helps identify molecular targets. Based on the results, a molecular tumour board recommends treatments, including off-label options and genetic counseling," Dr Biswal said. These targeted therapies can complement traditional treatments like surgery and chemotherapy, said Dr Patekar. Genetic screening is crucial in precision medicine, especially for those with a family history of cancer. Such individuals may undergo genetic testing to identify "abnormal genetic pathways". "For instance, in women with a family history of breast or ovarian cancer, BRCA1 or BRCA2 mutations are often detected," said Dr Mandeep Singh Malhotra, director of surgical oncology at CK Birla Hospital (R), Delhi. "In these cases, 'preventive interventions can be considered, such as risk-reducing mastectomy, prophylactic oophorectomy after menopause, or the use of chemoprevention through hormone

therapy," he said. The core principle of precision medicine is tailoring treatment to the individual, ensuring the right patients receive the right care. "This helps avoid overtreatment, which leads to unnecessary side effects, and prevents undertreatment, which leaves the patient vulnerable to cancer progression," says Dr Malhotra. Precision therapy serves as a key tool to identify patients requiring intensive treatments like surgery or chemoradiation and those who can be treated with less invasive methods such as radiation alone. "One key application is identifying high-risk individuals more likely to develop certain cancers, allowing for preemptive interventions. For example, women with BRCA (breast cancer gene) mutations, who are at high risk for breast and ovarian cancers, can be identified early and receive preventive treatments at the right time," said Dr Malhotra. Precision medicine is guiding treatment decisions, such as escalating or de-escalating therapy. For example, in throat cancer, specifically oropharyngeal cancer, precision medicine helps determine if the cancer is HPV-related, which may only require radiation, or smoking-related, necessitating more aggressive treatment. Helps make lifestyle changes. Precision therapy also aids in making lifestyle adjustments. By analysing a patient's genetic profile and environment,



doctors can recommend intensive screening or lifestyle changes, potentially reducing cancer risk by up to 98 per cent, said Dr Malhotra. According to Dr Atul Narayankar, consultant medical oncologist, Wockhardt Hospitals, Mira Road, precision therapy is a "game-changer" as it involves analysing the patient's data, examining genetic profiles, understanding the patient's lifestyle and environment, and then identifying the risk of any cancer. "This therapy is known to provide accurate diagnosis and make decisions when it comes to inculcating healthy habits and slashing down the chances of various types of cancer such as kidney and lung," said Dr

Narayankar. Although precision medicine is advancing rapidly, "it is not universally applicable to all cancers or accessible to everyone," said Dr. Patekar. "Some cancers, like breast, lung, and melanoma, have well-established targeted treatments, while others may have limited options," he said. According to Dr Patekar, "The cost of precision medicine can vary significantly, often depending on insurance coverage and the specific treatments involved." Dr Biswal concurred and shared that affordability remains an issue. "Hopefully with more research, the drugs can be made affordable for the benefit of the patients battling with cancer," he said.

## Chief Justice of India DY Chandrachud says his daughters have nemaline myopathy: 'The diagnostic test is so invasive and painful'

At a recent appearance, Chief Justice of India DY Chandrachud spoke about nemaline myopathy, the genetic condition his foster daughters were born with. "Our children have been born with a condition called nemaline myopathy. There is absence of knowledge about myopathy among doctors, caregivers, and certainly, on the part of the parents. Everyone lives with a feeling of self-denial. The families where the children are born feel nothing is wrong with them. There were no testing facilities even in major institutes in India," he said. Even where there are testing facilities, such as in Lucknow, "we were told that the diagnostic test is so invasive and painful that they would remove a part of the tissue from the child without anesthesia." "It's so terribly painful. I still remember the time the test was done for both children. After the older child underwent the test, all that she could say in that sense of pain, suffering from the test — 'don't allow my sister to go through the test'. There was the absence of adequate testing, absence of schools in Uttarakhand," recalled Justice Chandrachud at the 9th Annual National Consultation Stakeholders Consultation on 'Protecting the Rights of Children Living with Disability and Intersectionality of Disabilities' organised by the Juvenile Justice Committee of the Supreme

Court. Nemaline myopathy, also known as rod myopathy or nemaline rod myopathy, is a rare congenital disorder that affects the skeletal muscles, causing muscle weakness and other associated symptoms.

Dr Mansi Shah, consultant neurologist, Parkinson's disease and movement disorders specialist, Wockhardt Hospitals, Mira Road, said over time, it starts to weaken the muscles, reducing reflexes to sudden or alarming situations. "Nemaline myopathy is hereditary. This means that if someone from your family or relatives has nemaline myopathy, then you are more likely to develop it, too. It is mainly caused by genetic mutation. It negatively affects the proteins that are needed for the functioning of the muscles," said Dr Shah. The term "nemaline" comes from the Greek word "nema," meaning thread-like, referring to the rod-like structures (nemaline bodies) found in the muscle cells of affected individuals. "The condition is quite rare, occurring in approximately 1 in 50,000 births," said Dr Manisha Arora, director, internal medicine, CK Birla Hospital, Delhi.

People with this condition may experience various symptoms, including weakness in the face, neck, or trunk, difficulty feeding and swallowing, foot deformities, scoliosis, joint deformities, difficulty breathing, and decreased muscle tone. "However,

the severity of the symptoms experienced and the condition may vary from person to person. This is why it becomes essential to diagnose the condition early before it starts to progress," said Dr Shah. Your doctor may conduct some physical tests to look for nemaline myopathy. Further, he/she may also recommend some tests for advanced assessment, like genetic testing and muscle biopsy. "Unfortunately, there's no cure when it comes to treating nemaline myopathy. But with the help of certain treatments, one can try managing their condition and the symptoms," said Dr Shah. Dr Shah stressed that one cannot prevent this condition as it is genetic and lifelong. "But people can try treatment options like physical and occupational therapy to strengthen weakened muscles. If your symptoms start to worsen, then consider consulting a doctor for prompt attention," said Dr Shah.\* Respiratory support, such as non-invasive ventilation (BiPAP) or tracheostomy, to manage breathing difficulties

\* Surgery to treat joint contractures or scoliosis

\* Feeding support, such as enteral nutrition via tube feeding, for patients with severe swallowing difficulties

\* Physical therapy and low-impact exercises to maintain muscle strength and flexibility



# Issues in the treatment of 'rare diseases', and what the govt can do

The Delhi High Court last week issued directions aimed at improving the availability of so-called "orphan drugs", which are medications used to treat "rare diseases" — defined by the World Health Organization (WHO) as a debilitating, lifelong condition that affects 1 or fewer people in 1,000. Around 55 medical conditions — including Gaucher's disease, Lysosomal Storage Disorders (LSDs), and certain forms of muscular dystrophy — are classified as rare diseases in India. The National Registry for Rare and Other Inherited Disorders (NRROID) started by the Indian Council of Medical Research (ICMR) has the records of 14,472 rare disease patients in the country. Therapies are available for less than 5% of rare diseases, leading to less than 1 in 10 patients receiving disease-specific care. Existing treatments are often very expensive. While the Centre provides financial assistance to various Centres of Excellence (CoE) for treatment, stakeholders have gone to court to highlight challenges in accessing funds.

Group 1 includes diseases that can be treated with a one-time curative procedure. Group 2 diseases require long-term or lifelong treatment which are relatively less costly and have shown documented benefits, but patients need regular check-ups. Group 3 diseases are those for which effective treatments are available, but they are expensive and must often continue lifelong. There are challenges in selecting the right beneficiaries for these treatments. In 2021, the National Policy for Rare Diseases (NPRD) was launched, under which financial assistance up to Rs 50 lakh is provided to patients receiving treatment at an identified CoE. The CoEs include AIIMS in Delhi, PGIMER in Chandigarh and the Institute of Postgraduate Medical Education and Research at Kolkata's SSKM Hospital. The following year, the Health Ministry opened a Digital Portal for Crowdfunding & Voluntary Donations with information about patients and their rare diseases, the estimated cost of treatment, and bank details of the CoEs. Donors can choose the CoE and patient treatments they wish to support. Each CoE also has its own Rare Disease Fund, which is used with approval from its governing authority. In August 2024, the government told Parliament that financial assistance of Rs 24 crore had been released to CoEs for treating rare disease patients until August in the current financial year. Before that, Rs 3.15 crore, Rs 34.99 crore, and Rs 74 crore was released in 2021-22, 2022-23, and 2023-24 respectively. Further, Rs 35 crore has been released for purchasing equipment to improve patient care services.

**Cost of orphan drugs\*** Many medicines and therapies for rare diseases are patented, which makes them very expensive. The market for these drugs is small and the development costs are high, so pharmaceutical companies often don't find it profitable to produce them, pushing up prices.\* Developing and manufacturing these drugs in India could help bring down prices, but the government will have to offer incentives such as tax breaks to companies.\* Import of rare disease medicines



by patients does not attract customs duty, but companies that bring these drugs to India still pay 11% customs duty and 12% GST. Delhi High Court has now set a deadline of 30 days to process the necessary exemptions for these medicines under the customs, GST, and Income Tax laws.\* On January 3, 2019, the Department of Pharmaceuticals under the Union Ministry of Chemicals and Fertilisers issued an order freeing orphan drugs from price controls. The High Court expressed concern over

this exemption, saying "the position cannot continue in this manner".\* If treatments or medicines for rare diseases are not available, the government can, under the Patents Act of 1970, allow a third party to manufacture them against payment of a royalty to the patent holder. The government can also acquire patents to ensure the availability of medicines if the patent holder does not provide them. The court said there wasn't enough research and development in the field of rare diseases, and stressed

that negotiating with pharma companies and boosting domestic efforts could help lower costs of treatment.\* Delays and red tape in decision making is another problem. The National Rare Diseases Committee meeting in June 2023 discussed the delay in getting approval from the Drug Controller General of India (DCGI) for US-based Sarepta Therapeutics to sell its medicines in India. AIIMS and other CoEs were importing the drugs through distributors for patients, and the delay was impacting treatment.

## India facing critical shortage of cornea, says LVPEI founder Dr G N Rao

Hyderabad: India is facing a critical shortage of corneas for transplantation and against a requirement of 1 lakh corneal transplants every year, the healthcare system could only provide around 30,000, said Dr G N Rao, founder of LV Prasad Eye Institute (LVPEI). With the gap between demand and supply widening each year, there is a need for immediate and comprehensive action to prevent millions from losing their sight. There is a need to expand corneal donation programmes, establish more eye banks, institution of the hospital cornea retrieval programme etc, Dr G N Rao while interacting with press persons on Wednesday said. By 2030, we should aim to increase the number of corneal transplants from 30,000 to 60,000 annually. The network of eye banks must be expanded with at least 50 standard eye banks nationwide, each requiring an investment of approximately Rs 1 crore.





# How peer listening at schools can flip the script

First, there was a quad-building uphill climb to reach the accommodation every evening. Then, a weak-knee-straining descent on three consecutive mornings, albeit through wet-forest smells, and past the stone and wood of buildings that blended into the greens and browns of nature. In between, as the mist wafted in and out of Doon Valley in Mussoorie, the hours were filled with camaraderie, bridge-building, and chatter around how an adult community of educators and counsellors could support a generation of students to reach their peak potential. At what was heralded as India's first conference of mental health for schools — organised by Woodstock School in Uttarakhand towards the end of September — there were over 200 attendees from 77 schools. David Bott, who runs The Wellbeing Distillery in Melbourne, Australia, that consults with schools and educators, was the lead speaker, talking about choosing connection over correction, using the vocabulary of emotions, and the psychological sigh (a breathing exercise that helps reduce stress). It was only towards the end of the Pathways to Flourish 2024 conference that Binu Thomas, who heads personal counselling at the school, spoke about its Wellness Ambassador programme that brought children into a circle of trust. Through the programme, 15 student volunteers (for 480 schoolchildren) are trained to be peer supporters. They are put through training that uses role play, communication games, and scenario building among other tools, for 18-20 hours over a few weeks. The aim is to channel their strengths to be active listeners to fellow students, while also being taught about confidentiality, conflict management, and more. This spreads a culture of support through the student, staff, and parent community. "I was convinced that counselling had to go beyond an in-the-room service," says Thomas, of the programme that has been running for three years now. Students as peer influencers globally, such programmes are gaining more ground in the face of twin challenges: the rising number of adolescents struggling with mental health issues and a dearth of resources to help them. In 2021, UNICEF brought out The State of the World's Children report, On My Mind: Promoting, Protecting and Caring for Children's Mental Health, initiated to examine the mental health of children, adolescents, and caregivers. It found that while 83% of 15- to 23-year-olds in 21 countries believed that a good way to heal was to seek support, in India, only 41% believed this. And in a country where up to 14% of children report "often feeling depressed", the report also stated that "a cross-sectional study of 566 secondary school teachers in South India found that nearly 70% believed that depression was weakness, not sickness..." It is in this context that schools are now thinking harder about a peer support system for children. At Woodstock, through the programme, a group of students, mostly 15- to 17-year-olds, help with various aspects of boarding school life. They are able to identify homesickness in students who

have just joined, alert the counsellor if someone shows worrying signs of isolation or anxiety, and hold space for those who find it easier speaking to someone their age or a few years older. The team also helps host events around anti-bullying, cyber detox, sleep awareness, among others. Thomas says there is a strict filtering process for enrolment, involving a 400-word essay on why a student wants to be a Wellness Ambassador, references from a 'dormitory parent' and teachers, and a final interview. Peer supporters work with the counsellor closely. "We choose those who are all-rounders so they can also mentor students who may be struggling with time management or study resources," she says. Part of the process is to make sure the ambassadors are visible so children can approach them, but also for them to seek out children who may feel lonely, for instance. "So an ambassador may go and just have lunch with that child for a few days or meet them on the games field."

On the last day of the conference, the Wellness Ambassadors gather for a chat, instinctively suggesting everyone sit in a circle, the way they do at weekly team meetings. Sahiba Sindhu, 17, remembers her time as a new student in class 9, and how an ambassador helped her feel less homesick. Tisya Kanwar, 15, talks about how they trained in listening not just to the words, but also to look out for body language. Snigdha Matanhelia, 16, notes the change in her own interactions with people: "I realised I was giving solutions. Now, I just listen and mostly people come up with their own solutions." Thomas remembers one time at the end of term when the team got an email from a student expressing some anguish. "An ambassador reached the child's room and stayed there for the first five minutes before the dorm parent could reach," she says. Aadi Mehta, from Ahmedabad, who graduated from the school last year, used this idea of all-round campus wellness as his main poll plank when he stood for elections at the George Washington University, in Washington D.C., this year. As a Wellness Ambassador, he remembers the non-judgmental attitude that students needed to develop, to talk to peers. "It helped me form genuine connections in school," he says. He is now one of the senators at university, and hopes to make the college's functioning mental health support more visible to people so they reach out for help. Children respond to care about 45 kilometres away from Mussoorie is the Navadha School in Dehradun, run by the Building Dreams foundation. Set up just 300 metres from Sisambara basti, a colony of rag pickers and daily wagers, Ranjit Bar, 28, runs the school, where the children also have a peer support group. "We need it even more because so many of the children come from challenged backgrounds. A number of them are surrounded by substance abuse and financial abuse," he says. Bar says the peer-to-peer programme began with children who had a better grasp of academic concepts teaching younger children and slower-learning peers basic maths or lan-



guage skills. "These are all first-generation learners, and the main aim is to keep them in school. When we meet a child, we start the actual school curriculum only after six months," he says. Children from three to 16 are integrated into school through games and the food provided. The peer supporters step in at this point and stay with them if they need further help. "The world creates for people who have," says Bar, directing all his attention to those who have little. Seventeen peer educators for 117 children help children learn about hygiene, health, and nutrition as well. Since the children come from the same area, they chat with each other easily, but they have also learnt when to escalate to the special educator the school employs. "Kids must be taught boundaries" Aneesh Kumar, the associate professor of psychology at Christ University, Bengaluru, agrees that peer listeners can catch vulnerabilities early, so adults in the team — whether a teacher or counsellor — can take pre-emptive or preventative measures. "Students can be given age- and developmentally-appropriate tools to talk about mental health. For instance, if sex is being spoken about in a group, a peer educator can lead the others, with support of training from professionals and evidence-based information," he says. He adds, however, that the students must be hand-held at every stage and work closely with the counsellor, so they don't feel the mental load and are well-equipped with information and skills. "There are a few downsides, like they may take on more than they can handle. To limit this burden, they must be taught boundaries," he says. Another downside is that if the emphasis on confidentiality is not strong enough, it may turn into snitching, gossiping, and spying. Peer education is part of a larger, positive youth development framework that institutions adopt. Its central idea is the harnessing of students' strengths through an enabling environment. In layperson's language, it's about drawing a person's attention to what they're good at, so they lean in to those

traits and skills. Dr. Kumar says the overall framework percolates down to every area of school life, and has proven to be successful around the world, in terms of how teachers record the changes in "classroom climate". This is why schools are increasingly looking at it. Anju Soni, principal of Shiv Nadar School in Noida, says while three wellbeing prefects have been a part of the student council for three years, they are in the process of having 14 buddies who will chat with students about issues that concern them. After COVID-19, many schools felt the need for a more robust system that would build resilience, collaboration, and empathy. Peer support is a part of the social-emotional learning (SEL) 'syllabus' that many boards began to develop in the aftermath of the pandemic. While the Central Board of Secondary Education (CBSE) rolled out the Adolescent Peer Educators Leadership Programme in 2021, the Council for Indian School Certificate Exams (CISCE) is in the process of formulating a plan that will fan out over its 3,000-odd schools countrywide, in the next academic year. Joseph Immanuel, chief executive and secretary of the CISCE board, says, "The idea is for every teacher to be a counsellor." Then, through teacher and student training, the peer-to-peer support will be introduced. Parents must be looped in. Most schools do not keep parents specially informed about peer counselling programmes. They treat it like another school activity, involving the children's freedom of choice. For now, it's mainly schools that have enough teacher and counsellor support that are implementing it. But once a peer-to-peer programme becomes mass, parents may need to be inducted into it, so day scholars can be supported at home too. Narrative therapist Shelja Sen, who co-founded Children First, an organisation that builds programmes around wellbeing and resilience, says parents must be a part of the process when a child decides to volunteer for a peer listening or mentoring programme. "