



**TATHASTU**  
Institute Of Civil Services

# DAILY CURRENT AFFAIRS

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Institute Of Civil Services

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**CENTRE ISSUES OFFICE MEMORANDUM ON NATIONAL TASK FORCE**

# Centre issues office memorandum on National Task Force

**The Hindu Bureau**  
NEW DELHI

The Union Health Ministry on Wednesday issued an office memorandum for the constitution of the National Task Force (NTF) to formulate protocols governing the safety of doctors.

This is following a Supreme Court order on Tuesday.

The Cabinet Secretary will be the Chairperson of the task force that will provide recommendations regarding the safety, working conditions, and well-being of medical professionals

and other related matters.

As per the memorandum, the NTF shall prepare an action plan categorised under two heads – prevention of violence against medical professionals, and providing safe working conditions and providing an enforceable national protocol for dignified and safe working conditions for interns, residents, senior residents, doctors, nurses, and all medical professionals.

Additionally, healthcare institutes are required to conduct workshops for all employees of medical establishments.

- ❖ The Supreme Court has constituted a national task force (NTF) of senior medical professionals to formulate comprehensive safety protocols for healthcare workers across India.
- ❖ This decision comes in the wake of the rape and murder of a trainee doctor at RG Kar Medical College and Hospital in Kolkata, which has sparked widespread protests among the medical fraternity demanding enhanced safety measures.
- ❖ The Supreme Court bench took suo motu cognisance of the case, emphasising the urgent need for a national consensus on standard safety protocols for medical professionals.
- ❖ Current situation w.r.to safety protocols for healthcare workers across India

**Legal Provisions:**

- ❖ As per constitutional provisions, health and law and order are State subjects.
- ❖ Hence, it is the primary responsibility of the State government or Union Territory administration to take note of events and eventualities, and do what is necessary to prevent violence.
- ❖ The details of the number of fatalities of medical professionals due to attacks by families of patients are not maintained centrally.





### Need for a Safe Work Environment:

- ❖ Experts have pointed out that medical colleges often have ill-lit corridors, poorly secured wards, and long distances between departments.
- ❖ There is an urgent need to improve working and living conditions by ensuring proper lighting, security guards, cameras, and manned walk-throughs between departments, operation theatres, and emergency areas.
- ❖ These simple measures could make a real difference.

### Examples from Developed Countries

- ❖ Violence against healthcare workers is a global issue, but several countries have implemented effective measures to protect their medical professionals.
- ❖ The U.K.'s NHS enforces a zero-tolerance policy on violence, supported by a dedicated security team and a comprehensive reporting system.
- ❖ In the U.S., some States classify assaults on healthcare workers as felonies, acting as a strong deterrent.
- ❖ Australian hospitals have introduced safety measures like security personnel, panic buttons, and mandatory de-escalation training.
- ❖ India must urgently introduce a Central Protection Act and adopt similar measures to take stringent actions to ensure a safer environment for its healthcare workers.

### SC forms National Task Force

- ❖ The Supreme Court on Tuesday formed a 10-member National Task Force to make a blueprint for the safety and facility of healthcare workers at their workplace.

### Members

- ❖ The newly established NTF comprises a distinguished panel of medical experts from various specialisations, including:
  - ☛ Surgeon Vice-Admiral Aarti Sarin
  - ☛ Dr. D Nageshwar Reddy
  - ☛ Dr. M Shreenivas
  - ☛ Dr. Pratima Murty
  - ☛ Dr. Goverdhan Dutt Puri
  - ☛ Dr. Saumitra Rawat
  - ☛ Anita Saxena
  - ☛ Pallavi Sapre, Dean
  - ☛ Dr. Padma Srivastava
- ❖ In addition to the core members, the NTF will also include ex officio members such as:
  - ☛ The Cabinet Secretary to the Government of India,
  - ☛ The Home Secretary,
  - ☛ The Secretary of the Union Health Ministry,
  - ☛ The Chairperson of the National Medical Commission, and
  - ☛ The President of the National Board of Examiners.





### Responsibilities:

- ❖ The NTF has been tasked with the critical responsibility of devising an action plan to ensure the safety and well-being of medical professionals.
- ❖ It will particularly focus on preventing gender-based violence and creating dignified working conditions for interns, resident doctors, and non-resident doctors.

### Areas to be addressed

- ❖ The action plan will address several key areas, including:
  - ☛ Enhancing security in emergency rooms and other critical areas.
  - ☛ Implementing baggage screening to prevent the entry of arms.
  - ☛ Restricting the number of non-patient visitors.
  - ☛ Managing crowd control effectively.
  - ☛ Providing restrooms and gender-neutral spaces for medical staff.
  - ☛ Introducing biometric and facial recognition systems.
  - ☛ Improving lighting and installing CCTV in all hospital areas.
  - ☛ Arranging transport for medical professionals between 10 pm and 6 am.
  - ☛ Conducting workshops on handling grief and crisis situations.
  - ☛ Performing quarterly audits of institutional safety measures.
  - ☛ Establishing a police force commensurate with hospital footfall.
  - ☛ Applying the Prevention of Sexual Harassment (POSH) Act to medical establishments, ensuring the constitution of an Internal Complaints Committee (ICC).
  - ☛ Setting up an emergency helpline for medical professionals.





A TOOL SMALL ENOUGH TO EDIT PLANT GENOMES

# ICAR, Penn State team makes a tool small enough to edit plant genomes

Researchers have developed a plant genome editor consisting of a protein derived from *Deinococcus radiodurans* bacteria – famous for being able to survive extreme conditions. The protein is less than half the size of the proteins CRISPR commonly uses to target specific parts of the DNA

Sanjukta Mondal

**F**our, chocolate, cocoa powder, eggs, and butter are all the ingredients to make a sweet treat you crave.

The only thing you need right now is a step-by-step recipe to help you turn the ingredients into a yummy brownie.

### Too big for its britches

Nature also has the ingredients it needs to 'make' living organisms, using a genetic instruction manual called the genome. A small change in the genome's composition can determine whether the living thing being made is a flower that exhibits two petal colours, a cat that has big or small ears or if the coriander leaves will taste like soap to some people.

With the help of the CRISPR gene-editing tool, scientists today can precisely edit genomes to introduce desirable genetic traits or remove undesirable ones.

CRISPR holds the potential to revolutionise agriculture in particular by allowing agricultural scientists to increase crop yields and improve resistance to disease and anomalous weather through gene-editing. However, there has been a critical obstacle: a commonly used form of the CRISPR system is too big for plant genomes.

This system uses one of two proteins, Cas9 or Cas12, to target specific parts of the DNA. But they are too bulky for plant cells to accommodate.

### Smaller is better

A team of researchers led by Kutubuddin Molla from the ICAR-National Rice Research Institute in Cuttack and Mirza Baig from the Pennsylvania State University in the U.S. presented an alternative that could solve this major problem in plant genome editing in a recent paper in the journal *Plant Biotechnology Journal*.

They reported developing a plant genome editor consisting of a protein called ISDra2TnpB, derived from bacteria called *Deinococcus radiodurans* (famous for being able to survive extreme environmental conditions). ISDra2TnpB is less than half the size of Cas9 and Cas12.

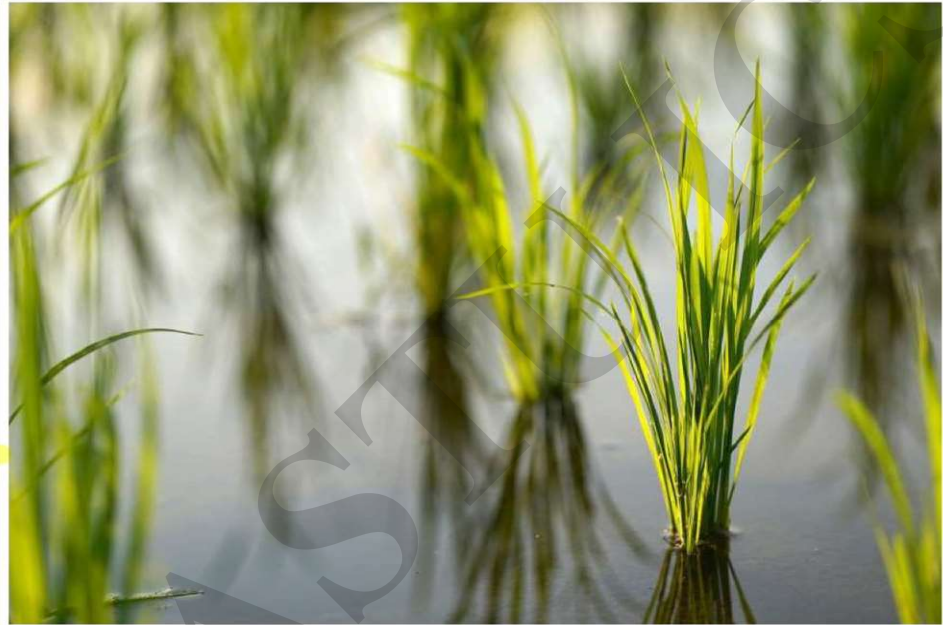
V.S. Sresty Tavva, principal scientist at the Crop Improvement Program at the Tata Institute for Genetics and Society (TIGS), Bengaluru, who wasn't involved in the study, expressed enthusiasm over its findings.

"Currently, [since] there are not many options available for plant genome editors, the improved TnpB certainly adds value. One should utilise the advantage of the size of TnpB in generating edited plants for various traits of interest," he said.

### TnpB's editing chops

TnpB is a protein made up of around 400 amino acid units (different combinations of the 20 amino acids make up all proteins). It belongs to a family of transposable elements, or transposons. Sometimes called "jumping genes", transposons are parts of a genome that can move from one location to another.

The genome consists of two strands of DNA bonded to each other. Each strand is made up of building blocks called nucleotides. In turn, each nucleotide has three pieces; two are common to all of them whereas the identity of the third



Paddy in Bali, Indonesia. Researchers have expressed hope a new miniature genome-editing tool will help rice crops become shorter and less prone to damage during cyclones. SERGIO CAMALICH/UNSPASH

one can be one of four options: adenine (A), thymine (T), cytosine (C) or guanine (G). The DNA's 'sequence' refers to the order in which nucleotides containing these four compounds are arranged.

In the new system, TnpB hitches a ride on a piece of RNA that guides it to the target DNA sequence. Once there the TnpB binds with the sequence and eliminates it. The cell that houses this DNA repairs the cut by restoring the "correct" sequence. Thus, the genome is modified to replace an undesirable sequence with a desirable one.

The researchers behind the new study exploited the genome editing abilities of a TnpB-based system to achieve a 33.58% editing efficiency in an average plant genome on targets that Cas9 or Cas12 couldn't reach. They demonstrated that the genome editor was effective on both types of flowering plants – monocots (like rice, which have one seed leaf) and dicots (like *Arabidopsis*, a plant related to cabbage and mustard that has two seed leaves).

### Codons and regulators

The team also built four versions of the TnpB-based editing tool and tested them on rice protoplasts – plant cells without the cell wall – to identify the best among them. In their initial experiments, the versions had a low editing efficiency.

To improve it, Dr. Molla et al. did two things. First, they used a process called codon optimisation. For example, cells in the body make the amino acid lysine by following an instruction in the genome represented by a sequence of three nucleotides. Such sequences of three are called codons.

The codon sequence that contains the recipe for lysine varies in different types of organisms. TnpB is a protein extracted



The CRISPR system uses one of two proteins, Cas9 or Cas12, to target specific parts of the DNA. But they are too bulky for plant cells to accommodate

from *D. radiodurans*, a prokaryotic bacteria, which has a different codon for lysine than do eukaryotes like plants. So the researchers edited the codon bias of TnpB to match that of rice protoplasts to improve the editing efficiency, Dr. Molla explained.

The second thing the researchers tweaked were the regulatory elements. When the TnpB and the specific RNA that guides it to the target DNA are transferred from a prokaryote to a eukaryote, researchers also need to include sequences called promoters and terminators that govern and regulate the expression of TnpB.

"We added promoters that are likely to enhance the expression of TnpB and lead to better editing," Dr. Molla said.

### A hi-res upgrade

The researchers finished with some finishing touches to the TnpB-based gene-editing system. They deactivated TnpB and fused it with another protein to create a 'hybrid' base editor.

When accompanied by the guide RNA, this editor could swap out a single nucleotide in the DNA sequence.

This wasn't possible with the previous version, with active TnpB, because it tended only to delete DNA sequences and couldn't swap one sequence for another. The new base editor thus opened up

exciting possibilities for crop innovation by facilitating the alteration of genes at the level of individual nucleotides.

### A future of edited plants

The TnpB-based editors the researchers built can edit the plant genome using both base editing and transcription activation, two widely used techniques in plant synthetic biology.

Dr. Tavva however said most of the claims were based on data obtained from protoplasts and that the scenario might change when dealing with processes by which an organism absorbs external DNA and integrates it into its genome.

It also appeared that the efficiency of the base editing system fell short in dicot plants as indicated by the results (0.2-0.46% average editing efficiency) reported using *Arabidopsis*. "Regardless," Dr. Tavva said, "the plant genome editing community should try this miniature editing system in crop species of their choice to improve various traits of interest."

TIGS director Rakesh Mishra echoed him: "It is exciting to see a novel and effective genome editing tool being invented. While more development will be needed, alternatives like this are welcome news."

The researchers have expressed hope this miniature genome editing tool will help remove anti-nutrient factors from food crops, reduce their susceptibility to pests, and help rice crops become shorter and less prone to damage during cyclones.

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### Genome:

- ❖ The genome represents the entirety of an organism's hereditary information, serving as a biological instruction manual inherited from parents. Composed of four nucleotide bases: adenine (A), cytosine (C), guanine (G), and thymine (T),
  - **Gene:** A gene is a unit of DNA that contains the instructions for making a specific protein or set of proteins.
  - **Sequencing:** The process of determining the exact order of the bases in a strand of DNA is known as sequencing. Because bases exist in pairs and the identity of one of the bases in the pair determines the identity of the other member of the pair, researchers are not required to report both bases of the pair.
  - **Genome Sequencing:** The sequence of base pairs is identical in all humans, there are differences in the genome of every human being that make them unique. The process of deciphering the order of base pairs, to decode the genetic fingerprint of a human is called genome sequencing.

### Practice Question:

- Q. What is genome sequencing? Discuss the significance of genome sequencing and gene editing in field of Agriculture. [150 words]

