

# CORTISOL X

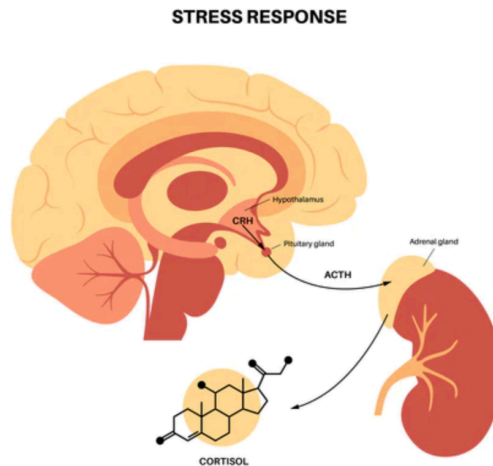
## stress is red

### WHAT IS CORTISOLX?

Cortisol X is a non invasive, non electronic bio sensor that measures the amount of stress an individual experiences by analysing the concentration of cortisol in human sweat.

### WHAT IS THE PROBLEM?

26 students committed suicide in Kota in 2023 which is the highest in the past 8 years. This elaborates the deteriorating mental health of students especially in high school and college.



THE GLOBAL GOALS



CortisolX directly addresses [SDG 3](#) by contributing to the detection of cortisol and promoting stress detection, preventing needless suffering from preventable diseases, and improving mental health and well-being of students.

Targeting [SDG 9](#), CortisolX fosters innovative technologies for cortisol detection, it contributes to advancements in industry and infrastructure.

CortisolX aligns with [SDG 16](#), contributing to developing peaceful, just, and resilient societies. By addressing the root causes of stress, CortisolX indirectly supports strong institutions and ethical practices, fostering a harmonious and stable global community.

News / India / Another student dies by suicide in Kota, 26th case this year

### Another student dies by suicide in Kota, 26th case this year

A minor girl who used to live in Kota's Vigyan Nagar area died by suicide. This is the second suicide case in past two weeks in the city.

### WHAT IS THE AIM?

CortisolX will quantify stress not as an emotion but as a disorder that should be taken seriously. CortisolX will reduce the stigma that especially Indian society has against mental illness and instead of dismissing it as "an exaggeration" or "excuse", it will be classified an illness that should be treated.

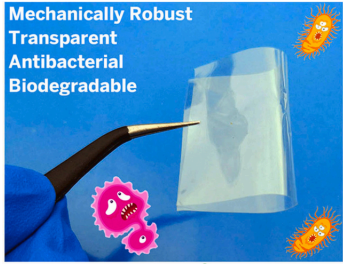


Manvy Devraj  
Nandini Tambi  
Lakshya Mutha



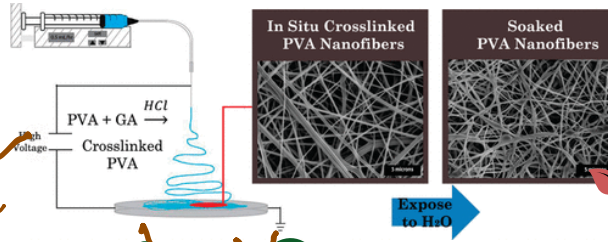
# THE PROCESS

with the PSS test results, with 1–10 ng mL<sup>-1</sup> for low-stress levels, 10–100 ng mL<sup>-1</sup> for medium-stress levels, and 100–1000 ng mL<sup>-1</sup> for high-stress level. The apocrine areas, such as the ax-



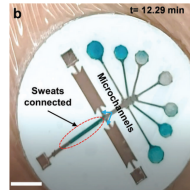
Mechanically Robust  
Transparent  
Antibacterial  
Biodegradable

With increasing concentration, the color of the formazan intensifies. The concentration of cortisol can be calculated as a function of full-color development.



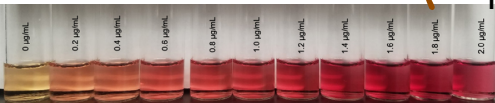
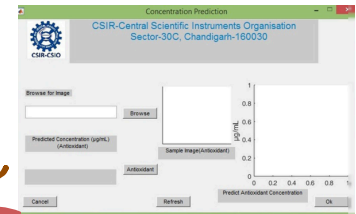
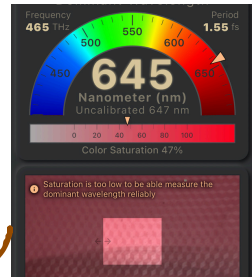
PVA and Glutaraldehyde will be cross linked to make the patch.

After 5 minutes of applying the patch under your forearm, the patch will change color. The darker color of red is produced, the higher the concentration of Cortisol in sweat, which can be correlated as a measure of stress levels in the body.



for consistent capillary pressure, the size must be <200 micrometers

The exact concentration of cortisol can be calculated spectrophotometrically or using apps like spectrometers on mobile phones for the estimate of concentration through saturation.



The redox reaction between blue terazolium and the corticosteroid in basic solution produces a red formazan.

A final prototype would be based on MATLAB software to calculate concentration through hue and saturation via a calibration curve.

## THE TREE OF LIFE

Much like the Tree of Life, CortisolX recognizes the profound interconnectedness within the human experience. Stress, a common thread in the fabric of life, affects individuals across diverse backgrounds, occupations, and circumstances. CortisolX acts as a nurturing force, akin to the roots of the Tree of Life, seeking to stabilize and strengthen the foundation of mental well-being. This tree is embedded in our offered stress-detection mechanisms.



NOW STRESS DOESN'T HAVE TO BE AN ABSTRACT.  
**STRESS IS RED**



# QUANTIFYING STRESS



We surveyed our school through Google Forms, bringing us about 300 responses in our first week. This allowed us to recognize stress patterns among students in the same grade or those participating in the same activities.

We tested 250 students and over two days. We collected their saliva using cotton swabs and added it to a test tube containing the required chemicals.



**CortisolX: Sensing Stress**

Please fill this form honestly and report based on your average/usual parameters. Also, know that all information input is strictly confidential and for research purposes only.

[Sign in to Google to save your progress. Learn more](#)

\* Indicates required question

Email \*

Your email

Almost all of the color changes took place within 2 minutes, providing us with varied hues of red, each measuring an individual's stress levels. The participants could then click a photo of the solution and get the stress percentage through an RGB-calculating Python code we provided earlier.

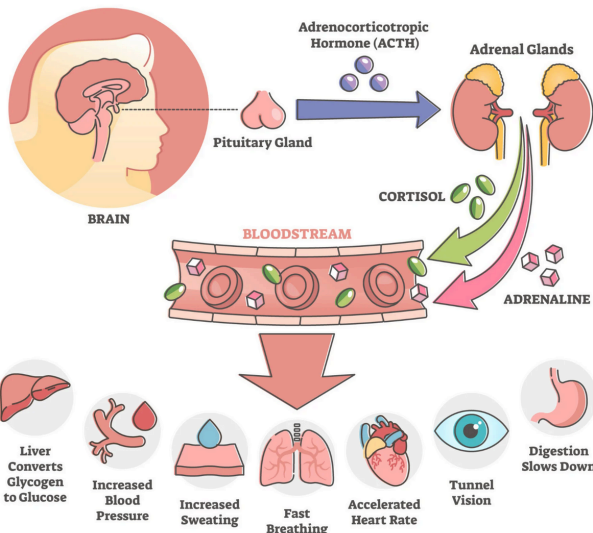
After our event's success, we made cortisol testing available on our school campus daily at a nominal price of 100 rupees (1 dollar, 20 cents) per test. We made approximately 40,000 rupees (500 dollars) throughout all tests. We plan to invest this sum towards expanding CortisolX in Kota, Rajasthan (highest no. of student suicides in India).



Test results: ↗

When we encountered someone with high stress levels, we guided them to our school's Head of Pastoral Care, Dr. Lekha Panicker.

## STRESS RESPONSE



## collaboration

We collaborated with another student-led project at our school called Serenity, through whom we got access to an artificially intelligent chatbot catered to individuals based on their symptoms.



**SERENITY**  
We feel, We heal

