



Capturing body sounds to monitor health

During even the most routine visits, physicians listen to sounds inside their patients’ bodies - air moving in and out of the lungs, heart beats and even digested food progressing through the long gastrointestinal tract. These sounds provide valuable information about a person’s health. And when these sounds subtly change or downright stop, it can signal a serious problem that warrants time-sensitive intervention.

Now, Northwestern University researchers are introducing new soft, miniaturised wearable devices that go well beyond episodic measurements obtained during occasional doctor exams. Softly adhered to the skin, the devices continuously track these subtle sounds simultaneously and wirelessly at multiple locations across nearly any region of the body.

In pilot studies, researchers tested the devices on 15 premature babies with respiratory and intestinal motility disorders and 55 adults, including 20 with

chronic lung diseases. Not only did the devices perform with clinical-grade accuracy, they also offered new functionalities that have not been developed nor introduced into research or clinical care.

“Currently, there are no existing methods for continuously monitoring and spatially mapping body sounds at home or in hospital settings. Physicians have to put a conventional, or a digital, stethoscope on different parts of the chest and back to listen to the lungs in a point-by-point fashion. In close collaborations with our clinical teams, we set out to develop a new strategy for monitoring patients in real-time on a continuous basis and without encumbrances associated with rigid, wired, bulky technology,” said Northwestern’s John A. Rogers, a bioelectronics pioneer who led the device development.

“The idea behind these devices is to provide highly accurate, continuous evaluation of patient health and then make clinical decisions



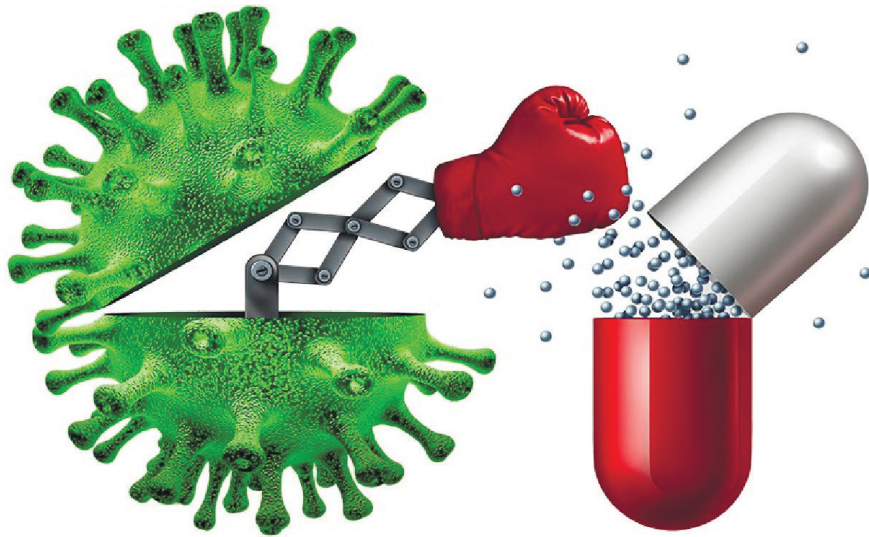
in the clinics or when patients are admitted to the hospital or attached to ventilators. A key advantage of this device is to be able to simultaneously listen and compare different regions of the lungs. Simply put, it’s like up to 13 highly trained doctors listening to different regions of the lungs simultaneously with their stethoscopes, and their minds are synced to create a continuous and a dynamic assessment

of the lung health that is translated into a movie on a real-life computer screen,”said Dr. Ankit Bharat, a thoracic surgeon at Northwestern Medicine, who led the clinical research in the adult subjects.

Containing pairs of high-performance, digital microphones and accelerometers, the small, lightweight devices gently adhere to the skin to create a comprehensive non-invasive sensing network. By simultaneously capturing sounds and correlating those sounds to body processes, the devices spatially map how air flows into,

through and out of the lungs as well as how cardiac rhythm changes in varied resting and active states, and how food, gas and fluids move through the intestines.

“Lungs don’t produce enough sound for a normal person to hear. They just aren’t loud enough, and hospitals can be noisy places. When there are people talking nearby or machines beeping, it can be incredibly difficult. An important aspect of our technology is that it can correct for those ambient sounds,” Bharat said.



Malnutrition can also cause antibiotic resistance

University of British Columbia researchers have uncovered startling connections between micronutrient deficiencies and the composition of gut microbiomes in early life that could help explain why resistance to antibiotics has been rising across the globe.

The team investigated how deficiencies in crucial micronutrients such as vitamin A, B12, folate, iron, and zinc affected the community of bacteria, viruses, fungi and other microbes that live in the digestive system.

They discovered that these deficiencies led to significant shifts in the gut microbiome of mice - most notably an alarming

expansion of bacteria and fungi known to be opportunistic pathogens. Importantly, mice with micronutrient deficiencies also exhibited a higher enrichment of genes that have been linked to antibiotic resistance.

“Micronutrient deficiency has been an overlooked factor in the conversation about global antibiotic resistance,” said Dr. Paula Littlejohn, a postdoctoral research fellow with UBC’s department of medical genetics and department of pediatrics, and the BC Children’s Hospital Research Institute.

“This is a significant discovery, as it suggests that nutrient deficiencies can make

the gut environment more conducive to the development of antibiotic resistance, which is a major global health concern.”

Bacteria naturally possess these genes as a defence mechanism.

Certain circumstances, such as antibiotic pressure or nutrient stress, cause an increase in these mechanisms.

This poses a threat that could render many potent antibiotics ineffective and lead to a future where common infections could become deadly.

Antibiotic resistance is often attributed to overuse and misuse of antibiotics, but the work of Dr. Littlejohn and her UBC colleagues suggests that the ‘hidden hunger’ of micronutrient deficiencies is another important factor.

“Globally, around 340 million children under five suffer from multiple micronutrient deficiencies, which not only affect their growth but also significantly alter their gut microbiomes,” said Dr. Littlejohn.

“Our findings are particularly concerning as these children are often prescribed antibiotics for malnutrition-related illnesses. Ironically, their gut microbiome may be primed for antibiotic resistance due to the underlying micronutrient deficiencies,” he added.

Soap enhances potency of anti-mosquito pesticides

Could the solution to the decades-long battle against malaria be as simple as soap? In a new study, scientists at The University of Texas at El Paso have made a compelling case for it.

The team has found that adding small quantities of liquid soap to some classes of pesticides can boost their potency by more than ten-fold.



The discovery is promising news as malaria-carrying mosquitoes display an increasing resistance to current insecticides, said Colince Kamdem, PhD, lead author of the study and assistant professor in UTEP’s Department of Biological Sciences.

“Over the past two decades, mosquitoes have become strongly resistant to most insecticides,” Kamdem said.

“It’s a race now to develop alternative compounds with new modes of action.”

Both laboratory tests and field trials have shown that neonicotinoids, a special class of insecticide, are a promising alternative to target populations showing resistance to existing insecticides, said UTEP Research Assistant Professor Caroline Fouet, PhD, second author of the study.

Neonicotinoids, however, do not kill some mosquito species unless their potency is boosted.

In this case, Fouet said, soap is the boosting substance.

Malaria is a devastating mosquito-borne disease that is prevalent in sub-Saharan Africa, Asia and Latin America, causing fever, fatigue, headaches and chills; the disease can be fatal.

In 2020, there were an estimated 241 million cases of malaria worldwide, according to the Centres for Disease Control, resulting in 627,000 deaths.

Current protocols from the World Health Organisation (WHO) for testing mosquitoes’ susceptibility to some insecticides recommend adding a seed oil-based product to insecticide concoctions.

Kamdem noticed when the compound was added, mosquito mortality increased from when the insecticide was used on its own.

“That compound belongs to the same class of substances as kitchen soap,” Kamdem said.

He and his team selected three low-cost, linseed-oil based soaps that are prevalent in sub-Saharan Africa -- Maître Savon de Marseille, Carolin Savon Noir and La Perdrix Savon - and added them

to four different neonicotinoids, acetamiprid, clothianidin, imidacloprid and thiamethoxam.

The hunch paid off. In all cases, the insecticides drastically enhanced potency, the team wrote in the study. “All three brands of soap increase mortality from 30 percent to 100 per cent compared to when the insecticides were used on their own,” said Ashu Fred, first author of the study and PhD student at Cameroon’s University of Yaoundé 1.

Spinal implant helps Parkinson’s patient walk

People with late-stage Parkinson’s disease (PD) often suffer from debilitating locomotor deficits that are resistant to currently available therapies. To alleviate these deficits, we developed a neuroprosthesis operating in a closed loop that targets the dorsal root entry zones innervating lumbosacral segments to reproduce the natural spatiotemporal activation of the lumbosacral spinal cord during walking. We first developed this neuroprosthesis



in a non-human primate model that replicates locomotor deficits due to PD. This neuroprosthesis not only alleviated locomotor deficits but also restored skilled walking in this model. We then implanted

that the neuroprosthesis interacted synergistically with deep brain stimulation of the subthalamic nucleus and dopaminergic replacement therapies to alleviate asymmetry, promote longer steps, improve balance, and reduce freezing of gait. This neuroprosthesis opens new perspectives to reduce the severity of locomotor deficits in people with PD.

Certain areas of body age faster: Study

V.V.S. Manian

Researchers have come up with scientific evidence that age is just a number. A body’s true age differs from person to person and does not depend on the year it was born. Researchers have identified four specific “age identifiers” - metabolic, immune, hepatic, and nephrotic - that determine whether certain areas of the body age faster in different people. “Age identifiers” can help people reset health risk factors and find the areas where they’re likely to encounter problems down the road, says researcher Michael Snyder.

How old are you? Those of you who are in the habit of dropping in years should no longer lie. Researchers have come up with scientific evidence that age is just a number - and that a body’s true age differs from person to person and does not depend on the year it was born. A team led by researcher Michael Snyder of Stanford University School of Medicine claims that there are four specific “age identifiers” - metabolic, immune, liver and nephrotic (related) to the kidneys - that determine how certain areas of your body age faster than your biological age and how

such changes may herald future health problems.

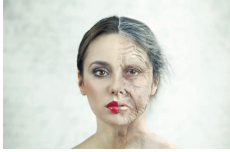
“Our study provides a comprehensive look at how we age by studying a wide range of molecules and taking multiple samples over years from each participant,” Snyder said in a report published in January 2020.

It’s not the year you were born that determines your age; it’s four physical “age identifiers”.

People with an “aging” metabolism are more likely to develop heart disease, obesity, and type 2 diabetes due to the rapid aging of their metabolic rate - the chemical reactions in the body’s cells that change food into energy. Although it poses a higher risk of weight-related diseases, a person with a larger metabolism than his age may still have a stronger immune system than a younger person.

“Age ID” vaccines concern a person whose immune system ages faster than the rest of the body. Increased immune system maturity often triggers inflammation throughout the body and increases the risk of autoimmune diseases like rheumatoid arthritis, lupus, type 1 diabetes, and multiple sclerosis.

These livers are people who suffer from a liver that ages faster than their age—an essential organ necessary to detoxify the



blood from all those toxic substances, like alcohol and drugs. Rapid aging ultimately reduces the liver’s ability to function properly as a person ages, leaving it susceptible to cirrhosis and

non-alcoholic fatty liver disease. Nephrotic concerns the kidney, the filter of waste from the blood that leads to the production of urine, balances body fluids, and helps balance blood pressure.

People with rapidly aging kidneys may expect to experience high blood pressure and kidney failure later in life.

(Source: Medical News)

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AUCTION NOTICE
The following borrowers of Shivalik Small Finance Bank Ltd. are hereby informed that Gold Loan/s availed by them from the Bank have not been adjusted by them despite various demands and notices including individual notices issued by the Bank. All borrowers are hereby informed that it has been decided to auction the Gold ornaments kept as security with the Bank and accordingly 07.12.2023 has been fixed as the date of auction at 12:00 noon in the branch premises from where the loan was availed. All, including the borrowers, account holders and public at large can participate in this auction on as per the terms and conditions of auction.

Branch	Account No.	Acct Holder name	Father's/ Spouse Name	Address	Ac opening Date	Payoff
INDORE	101042515835	PREMKUMAR A	S/O ALAGURAJ	D NO 5 2 21A, THENI TALUK, EAST STREET, VEERAPANDI (TP), THENI MUTHUTHEVANPATTI TN 625534	19-05-2023	42479.27
INDORE	101042516409	PREMKUMAR A	S/O ALAGURAJ	D NO 5 2 21A, THENI TALUK, EAST STREET, VEERAPANDI (TP), THENI MUTHUTHEVANPATTI TN 625534	14-06-2023	194283.34
INDORE	101042517466	PREMKUMAR A	S/O ALAGURAJ	D NO 5 2 21A, THENI TALUK, EAST STREET, VEERAPANDI (TP), THENI MUTHUTHEVANPATTI TN 625534	23-08-2023	35938.81
INDORE	101042517370	PREMKUMAR A	S/O ALAGURAJ	D NO 5 2 21A, THENI TALUK, EAST STREET, VEERAPANDI (TP), THENI MUTHUTHEVANPATTI TN 625534	16-08-2023	46930.23

Auction date is 07.12.2023 @12:00 Noon.
The Bank reserves the right to delete any account from the auction or cancel the auction without any prior notice.
Authorised Officer, Shivalik Small Finance Bank Ltd.
Note: The earlier publication done on date 21/11/23 stands null and void, as the auction which was scheduled on 28/11/23 has been rescheduled on 07/12/23. Regret inconvenience caused.