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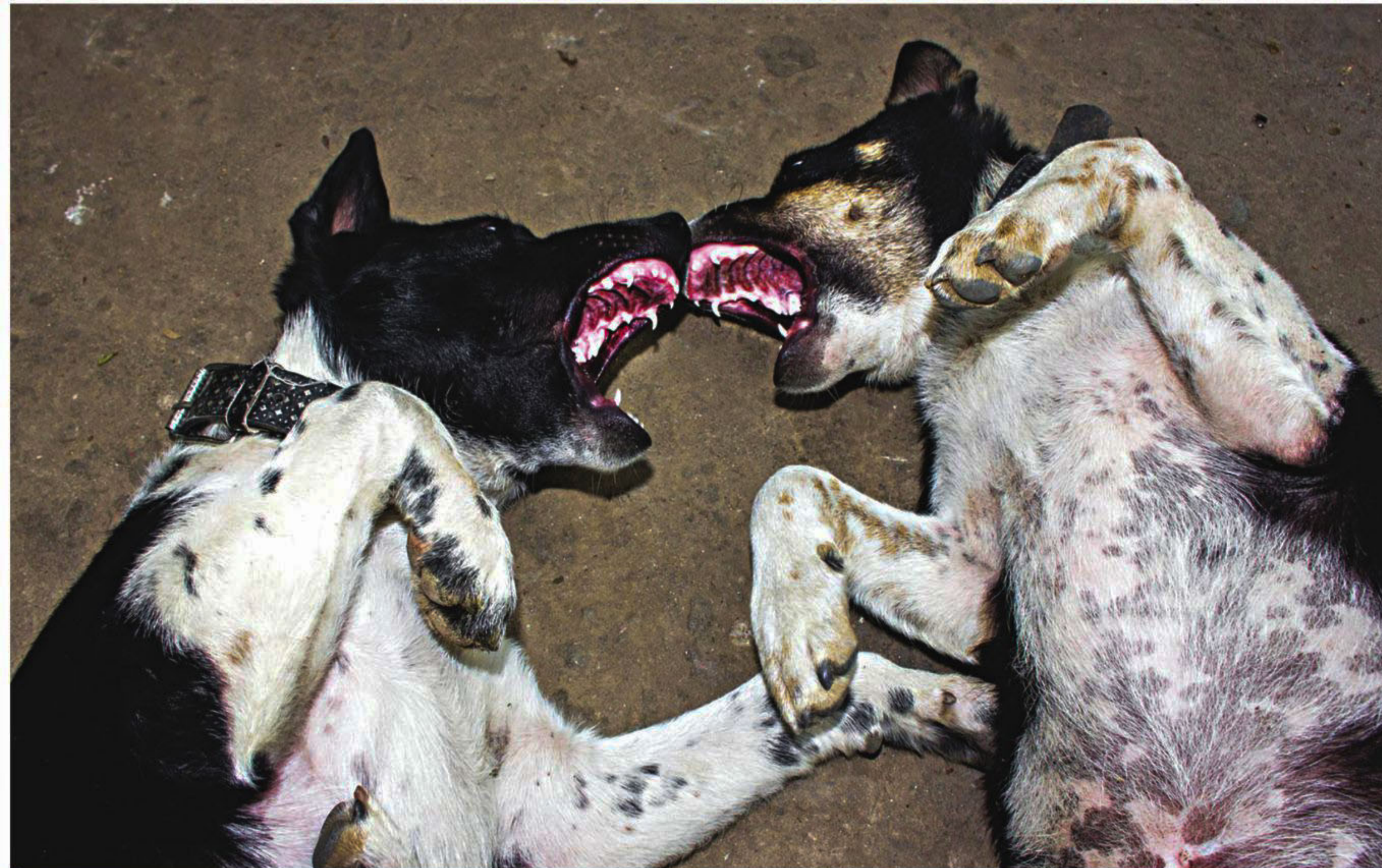


PHOTO: MD ENAMUL KABIR

"The fury of a demon instantly possessed me. I knew myself no longer. My original soul seemed, at once, to take its flight from my body; and a more than fiendish malevolence, gin-nurtured, thrilled every fibre of my frame." — Edgar Allan Poe

SNAPSHOT

MAILBOX

Please note we have a new email address:
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First issue of 2018

The editor's note of the *Star Weekend* issue of January 5 was a wonderful piece of writing to wrap up the news that has gone by last year. The past year has left many indelible impressions for us to ponder and we all have to do a little soul-searching in order to face the year ahead.

We embark on a new year in which we will read more news—good, bad, exciting. Stories and events in 2017 may have had a small impact or led to some change in our lives. It may even have brought about changes in the government. But without some sort of lesson learnt from the news that was reported day after day, there is little point to reporting on issues that matter.

Mashudul Haque
Central Road, Dhaka

An informative read

The last issue of the *Star Weekend* addressed the most crucial issues of last year and provided updates about them. I enjoyed reading the articles since it gave me more information on issues that were almost forgotten. We live in a time when the social media rules the roost. One second we are on to something, and then we forget about that very issue by merely opening a new tab or scrolling down. The last issue of *Star Weekend* which had articles on disappearances to the state of Haor after the floods, was a timely reminder to all of us that there's still a lot to do. Sure, it may be a new year, but the problems of old continue to plague us and we need to address them and find solutions as soon as possible.

Sharmin Akhter,
Farmgate, Dhaka

Wonderful year-end satire special

I read with utmost interest the timely year-end special satire issue of the *Star Weekend* magazine. How wonderfully you have described worrying events of 2017 with wit and a good sense of humour!

Every write-up ranging from politics to sports, human rights to education was a marvel to read. Let good sense prevail among us all that the happenings of the past will not reflect in the new year. We hope Bangladesh will enter into a new era in 2018 and its troubles will slowly be addressed.

I wish every writer in the *Star Weekend* team and its voracious readers a prosperous, wonderful new year.
Nuzhat Rifa Ehsan
Baridhara, Dhaka

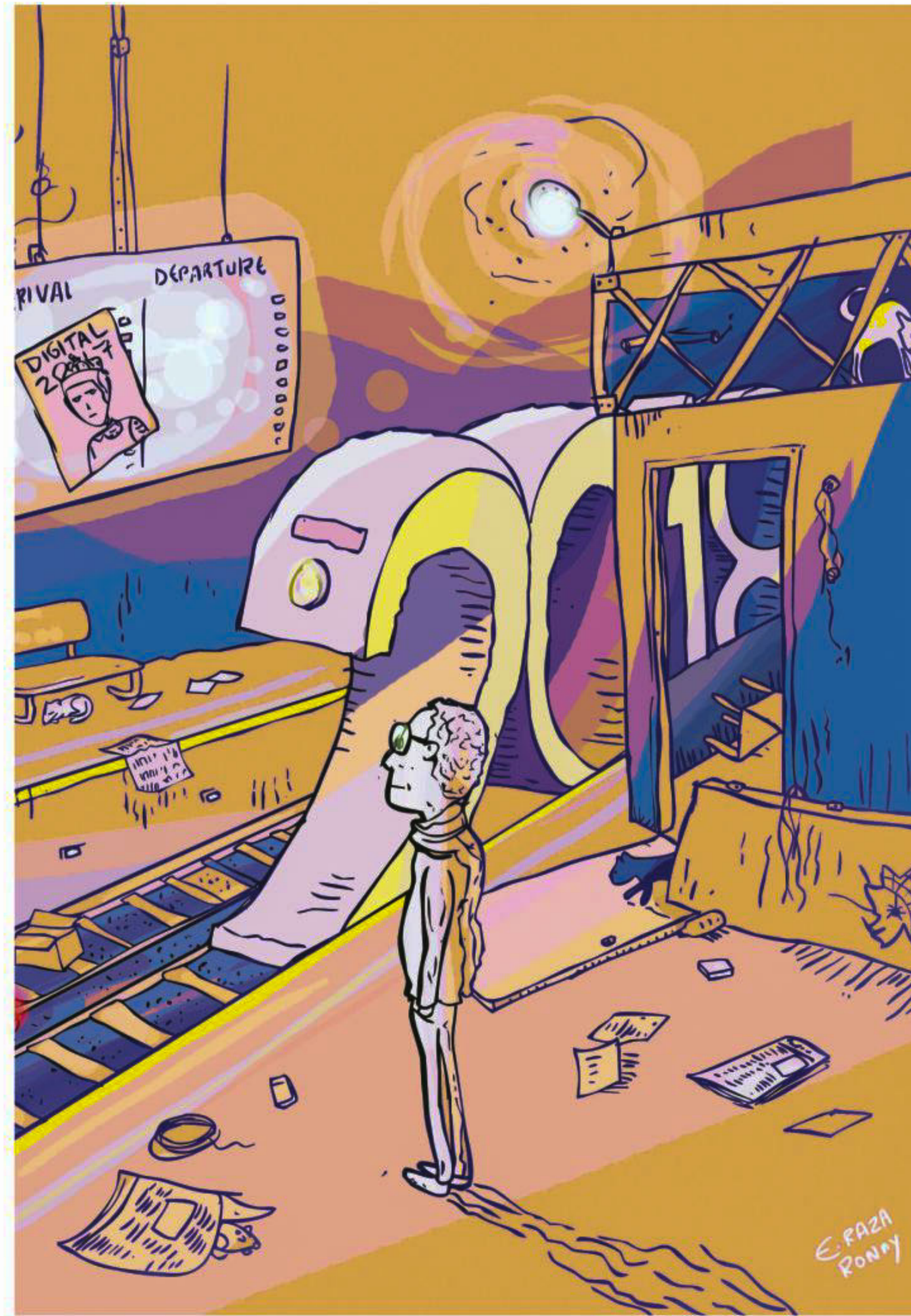


ILLUSTRATION: E R RONNY

The opinions expressed in these letters do not necessarily represent the views of the *Star Weekend*.

SCIENCE

Few contemporary advances in biotechnology have captured public imagination as much as the discovery of the CRISPR-Cas system. Startups like Intellia Therapeutics and Editas Medicine have raised hundreds of millions of dollars on the promise of CRISPR-based gene editing. This could be a truly revolutionary moment in the history of human technology.

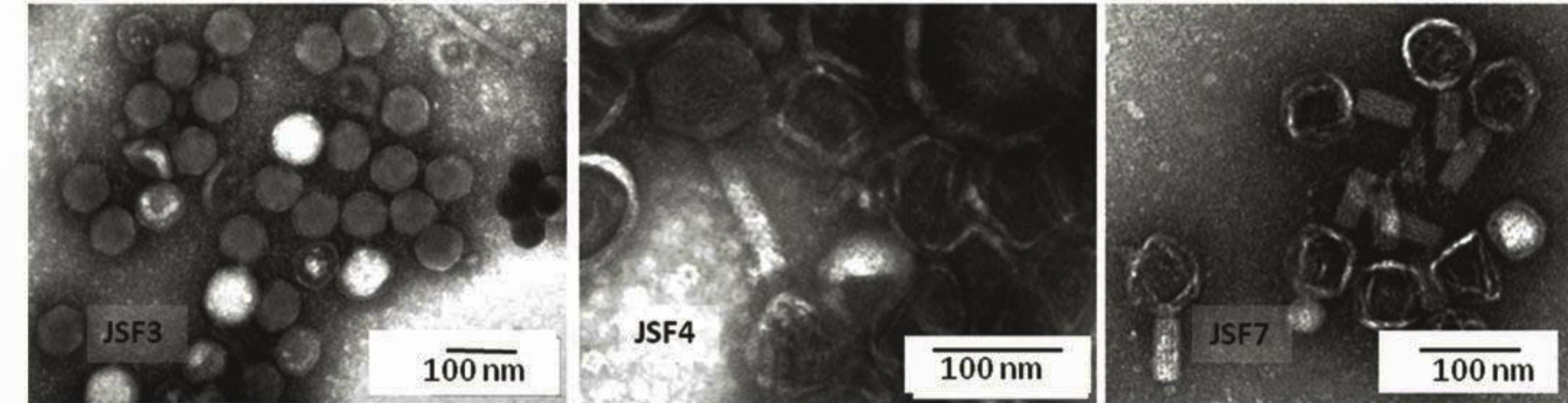
But what exactly is the CRISPR-Cas system? CRISPR-Cas is a collection of DNA sequences and proteins often found in bacteria that protects them from viral infection. It can act as a kind of bacterial "immune system"—recognising very specific snippets of viral DNA, and then destroying these DNA sequences to eliminate invading viruses. Just as human beings are

As with many tools in biotechnology, from painkillers to vaccines, the CRISPR-Cas system was not synthesised from scratch by human engineers and chemists. It is something already found in the wild, a product of nature that we can reshape for our own purposes. Thus, to fully realise the potential of technologies like CRISPR gene editing we must continue to generate more knowledge on the natural diversity and functionality of this system.

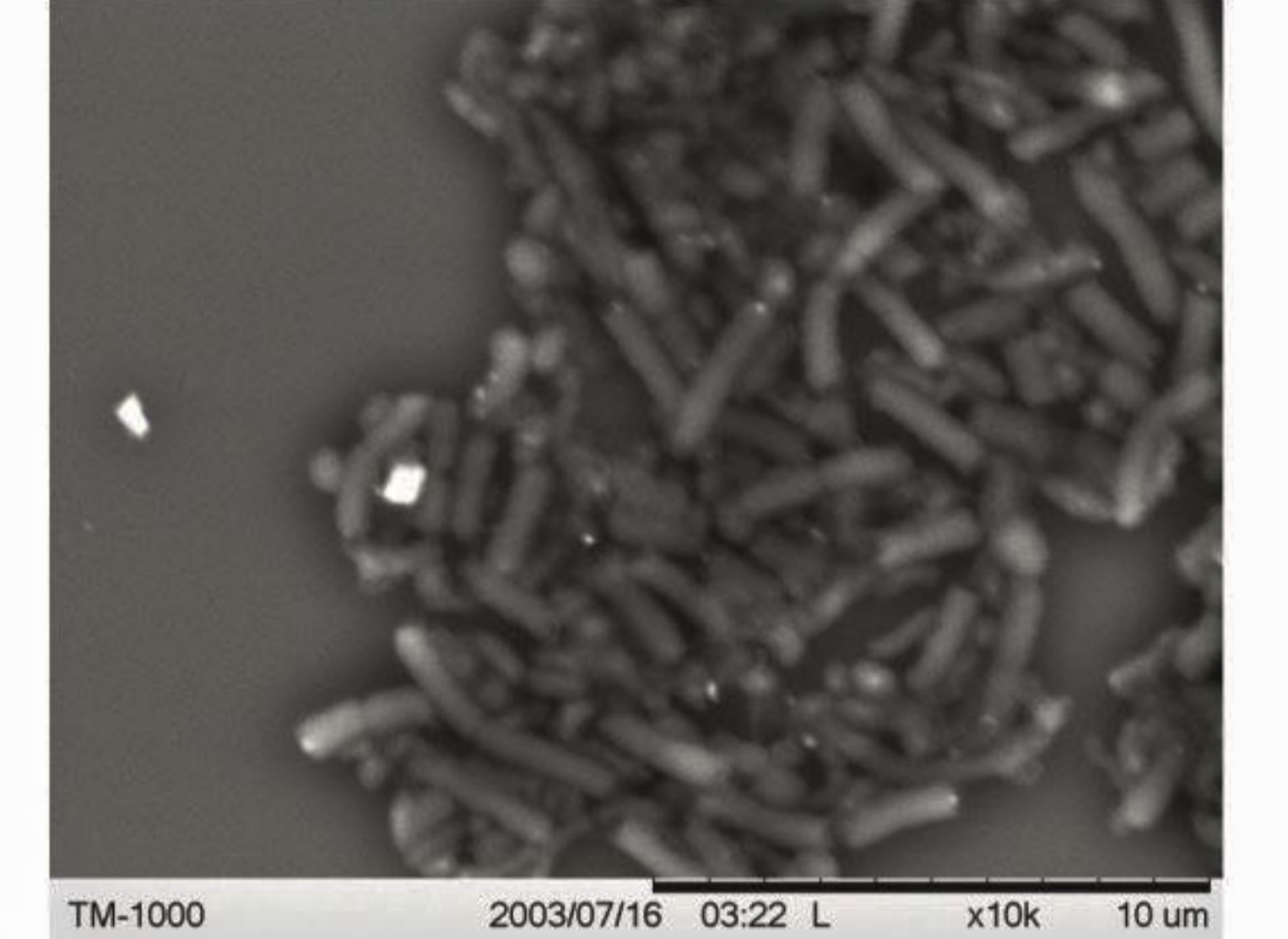
Many people would be surprised to hear that such a cutting-edge topic in biology is an active area of research and discovery in Bangladesh, but this is exactly the case with recent research conducted at icddr,b by Professor Shah Faruque and colleagues. Professor Faruque had maintained an active research team in icddr,b for over two decades, and has now moved to

use the CRISPR-Cas system to suppress the defences of cholera bacteria and infect them more effectively. By studying DNA sequences from multiple viruses and bacteria collected in Bangladesh over many years, Dr Faruque and his group were also able to demonstrate that the viral CRISPR-Cas system is continuously evolving. The virus and the bacteria are locked in an "evolutionary arms race", their genetic material constantly mutating to counter the other's defence mechanisms.

These findings could be used to engineer viruses to kill the cholera pathogen for therapy or for environmental control of deadly epidemics. Given the serious danger that cholera epidemics pose during times of crisis in developing countries, from the conflict



Electron microscopic picture showing Morphology of viruses which carry CRISPR and act on the cholera pathogen



Electron microscopic picture showing morphology of cholera pathogen

CUTTING EDGE GENOMIC RESEARCH IN BANGLADESH

BRAC University Professor uncovers new insights of viral CRISPR-Cas System

ZAIN OMAR ALI

engaged in a constant immune war against infectious bacteria and viruses, bacteria themselves struggle against viruses that attack and kill them. These bacteria-killing viruses are called bacteriophages—"eaters of bacteria".

It is the ability of the CRISPR-Cas to target and destroy very specific DNA sequences that makes it a powerful tool for genetic engineering. If the system was not so precise the bacteria could miss its target, or risk destroying its own DNA and killing itself. The same precision can now be used by genetic engineers—in 2017 CRISPR gene editing was used to cure genetic deafness in mice, and it is only a matter of time before similar applications are extended to human patients.

BRAC University to strengthen life science research in the Department of Mathematics and Natural Sciences.

Professor Faruque's findings, recently published in the prominent Nature Publishing Group journal *Scientific Reports*, analyse the CRISPR-Cas system in a group of cholera bacteriophages, viruses that attack *Vibrio cholerae*, the bacteria responsible for causing cholera. Dr Faruque's results build on the research of Andrew Camilli, who discovered these viral CRISPR-Cas elements in 2013.

The vast majority of CRISPR-Cas systems studied previously exist in bacteria to defend against viruses. In a remarkable twist, the particular elements studied by Professor Faruque exist instead in the viruses that attack bacteria.

These cholera-killing viruses are our allies in the fight against this deadly diarrhoeal disease—previous work by Professor Faruque's group has shown that these naturally occurring viruses help to stop seasonal cholera epidemics in Bangladesh by killing the pathogenic bacteria in contaminated water.

Professor Faruque's recent paper uses cutting-edge whole genome sequencing to show that these viruses

in Yemen to the crowded camps of displaced Rohingya Myanmar nationals in Bangladesh, this work could have great value for saving human life in the future.

Perhaps the most remarkable aspect of this research is that it was entirely done by Bangladeshi scientists, with no foreign collaborators. These results are a testament to the value of supporting local scientists and developing our own research capacity, without being overly reliant on foreign specialists. Other members in Professor Faruque's research team in icddr,b who contributed substantially to this work are Iftekhar Bin Naser, M Mozammel Hoque, M Ausrufuggaman Nahid, Tokee M Tareq and Kamruzzaman Rocky.

Professor Faruque has recently left his position at icddr,b to start a new research group at BRAC University, where he can focus on expanding the research capability of one of the nation's premier private universities. When asked about his future plans at BRAC University, Professor Faruque expresses his motivations for this new initiative with passionate clarity: "The purpose of this endeavour is to build the life science research capabilities of a Bangladeshi university, to increase its visibility to the donor community, and in turn attract more research grants, to be able to build the next generation of Bangladeshi researchers."

Zain Omar Ali is a freelance science writer and received his Master's in Molecular and Cellular Biology from Harvard University.

বিশ্ব বলেছিলো- পদ্মা সেতু 'সম্ভব না' একজন প্রধানমন্ত্রী আর ১৬ কোটি বাঙালি বলেছিলো- 'কেন না!'

BSRM
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