

on 30 August 2018 in *Molecular Biology and Evolution*.

Since then, however, he's learned of additional studies pointing to common origins for neurons and other secretory cells in embryonic development—and perhaps in evolution. In his talk at the SICB meeting, he noted that one team showed more than 25 years ago that the stinging cells of jellyfish, another specialized secretory cell type, arise from the same embryonic precursors as the animal's nerve cells. He cited similar evidence for hydra and fruit flies. "It's a really generalizable thing," he says.

The finding could settle a long-standing debate. In 2013, a research team analyzing the newly sequenced genome of a comb jelly known as the sea gooseberry (*Pleurobrachia bachei*) discovered it was missing multiple genes active in the nervous systems of most animals: certain *Hox* genes, which control development, and the gene for the neurotransmitter serotonin. That discovery led the team to propose that comb jellies evolved a nervous system independently from almost all other animals (*Science*, 25 January 2013, p. 391). But many wondered how something so complex could have evolved twice.

Finding a common developmental source for neurons in comb jellies, jellyfish, and many other animals suggests it didn't, Ryan and others now say. The work shows "the platform upon which the nervous system was built was there" in the last common ancestor of animals, says Timothy Jegla, a neurobiologist at Pennsylvania State University in University Park. "Relatively simple reprogramming [of] stem cells during development can lead to whole new cell types and tissues, and the nervous system is probably just another example of that." Other researchers, however, say it's still possible that nerve cells had multiple origins after the last common ancestor, each time arising from the same stem cell lineage.

Next, Ryan, Babonis, and Whitney lab neurophysiologist Yuriy Bobkov hope to learn how progenitor cells develop into neurons by studying a simple sensory organ—the "warts" of the warty comb jelly, or sea walnut (*Mnemiopsis leidyi*). Recent work shows that each wart contains about 500 nerve and muscle cells that react to light, the smell of fish, and mechanical stimuli. Warts regenerate if cut off, and by tracing gene activity of their cells as they regrow and specialize, Ryan hopes his team can pin down the genes directing nerve cell formation—and perhaps, he says, "peel back some of the complexity of the evolution of neurons." ■



A member of UNICEF's Ebola outreach team addresses the public in Beni, in the Democratic Republic of the Congo.

INFECTIOUS DISEASES

In Congo, fighting a virus and a groundswell of fake news

Armed conflict and political tensions stoke rumors and misinformation about Ebola

By Laura Spinney

The Ebola epidemic in the Democratic Republic of the Congo (DRC) is providing a natural experiment in fighting fake news. Occurring in a conflict zone, amid a controversial presidential election, the epidemic has proved to be fertile ground for conspiracy theories and political manipulation, which can hamper efforts to treat patients and fight the virus's spread. Public health workers have mounted an unprecedented effort to counter misinformation, saying the success or failure of the Ebola response may pivot on who controls the narrative.

Tensions are expected to rise in the wake of the 10 January declaration by the DRC's election commission that opposition leader Felix Tshisekedi won the election, held on 30 December. Foreign observers and the Roman Catholic Church's monitors say Martin Fayulu, another opposition figure, garnered more votes, and his supporters are alleging fraud. Health workers know rumors thrive amid uncertainty.

"I usually tell my teams that we fight two outbreaks, Ebola and fear," says Carlos Navarro Colorado of the United Nations

International Children's Emergency Fund (UNICEF) in New York City. "It is all about information." For the first time in an Ebola outbreak, UNICEF and other agencies have joined forces as a single response team, which answers to the DRC's Ministry of Health in Kinshasa and includes dozens of social scientists. They use the airwaves, social media, and meetings with community and religious leaders to fight misinformation. Responders also foster trust by making their work more transparent—in some cases literally. A new biosecure tent, called the Biosecure Emergency Care Unit for Outbreaks (CUBE), allows relatives to visit and see Ebola patients during treatment.

With 600 confirmed cases and 343 deaths recorded since August 2018, the outbreak is the second largest ever after the massive epidemic that struck West Africa 5 years ago and killed more than 11,000. Conflict has smoldered for years in North Kivu, an anti-government stronghold, and some at-risk areas are inaccessible because they are controlled by armed rebels or can't be reached by road or rail. The outbreak has already reached several urban centers, including Butembo, a city of almost 700,000. An experimental vaccine developed by Merck and

given to nearly 60,000 people so far has likely slowed the virus but hasn't stopped it.

In West Africa, fear kept people away from clinics, causing Ebola cases, as well as diseases such as measles and malaria to go untreated. Mistrust of governments and aid workers ran high and rumors were rife.

That's even more true in the DRC now. In September 2018, an opposition politician, Crispin Mbindule Mitono, claimed on local radio that a government lab had manufactured the Ebola virus "to exterminate the population of Beni," a city that was one of the earliest foci of the outbreak. Another rumor has it that the Merck vaccine renders its recipients sterile. On 26 December, the national election commission decided to exclude Beni and Butembo from the polls because of the epidemic; the following day, an Ebola evaluation center was attacked during protests.

Although opposition organizations condemned the commission's decision, they called for the Ebola response to be protected—which health workers saw as a small but significant victory.

"We've managed to get communities to separate in their minds Ebola control from the broader political agenda," says Michael Ryan of the World Health Organization in Geneva, Switzerland. "That's been really helpful." Ryan hands much of the credit to social scientists working for the various agencies involved in the response.

Along with community engagement workers, they make up one-third of the workforce.

Part of their role is to chart the social networks through which the virus spreads, but they also gather information about communities' perceptions, which is entered within days into an online "dashboard" created by the International Federation of Red Cross and Red Crescent Societies (IFRC) in Geneva. The government has also recruited young people to report misinformation circulating on WhatsApp, a major information channel in the DRC, says Jessica Ilunga, a spokesperson for the health ministry.

As rumors surface, communications experts rebut them with accurate information via WhatsApp or local radio. They take care not to repeat the misinformation; research has shown this is the best way to help the public "forget" false news and reinforce the truth. The vocal support of Ebola survivors has helped as well. Grateful for their care, some have become volunteers at Ebola treatment centers (ETCs).

So far, the responders believe they are winning the information war. People who might be ill are now far more willing to accept a referral to an ETC than early in the

epidemic, says IFRC's Ombretta Baggio.

The CUBE, used for the first time in this outbreak, is also a big help, says Tajudeen Oyewale, UNICEF's deputy representative in the DRC. In the past, visitors were kept at a safe distance from patients at ETCs or not permitted at all. Designed by a Senegal-based organization called ALIMA, the CUBE, with its transparent walls and external arm entries—like those in a laboratory glove box—allows patients and their relatives to see and speak to each other up close. The €15,000, reusable units also improve care, because health workers don't need to wear cumbersome protective gear that limits their movements and can only be worn for a short time.

Organized tours of the ETCs for members of the local community have helped, too, as have creches for the children of sick mothers, located close to the centers. Ambulances in North Kivu no longer use sirens when transporting suspected Ebola patients, as the sound was judged stigmatizing in West Africa.

Burial practices keep evolving as well. In early Ebola epidemics, victims were often buried unceremoniously, sealed in opaque body bags, with no opportunity for relatives and friends to say farewell. That bred resentment and stoked rumors about corpses being stolen to sell their organs. In "safe and dignified" burials, introduced

in the West Africa epidemic, families are given more opportunities to spend time with the body. For the current epidemic, responders procured transparent body bags, allowing families to see their loved one until the coffin is closed.

"One of the starkest lessons we learned in West Africa is that we don't need to change everything about a traditional burial," says anthropologist Juliet Bedford, director of a consultancy called Anthrologica in Oxford, U.K. "We just need to make sure it is medically safe." Even touching the body is sometimes allowed, provided relatives wear protective clothing.

Contingency plans are in place in case of further unrest, and the partner agencies have bolstered preparedness in neighboring areas not yet touched by the epidemic. Ryan says the political problems may have an upside: "Communities that resist are energetic," he says. "If you can turn that negative energy into positive energy, then it becomes a force for good. You just have to know how to pick that lock." ■

Laura Spinney is a journalist based in Paris.

PLANETARY SCIENCE

Dueling spacecraft look deep into Saturn and Jupiter

NASA probes reveal surprising contrasts between two gas giants

By Paul Voosen

A clever use of radio signals from planetary spacecraft is allowing researchers to pierce the swirling clouds that hide the interiors of Jupiter and Saturn, where crushing pressure transforms matter into states unknown on Earth. The effort, led by Luciano Iess of Sapienza University in Rome, turned signals from two NASA probes, Cassini at Saturn and Juno at Jupiter, into probes of gravitational variations that originate deep inside these gas giants.

What the researchers have found is fueling a high-stakes game of compare and contrast. The results, published last year in *Nature* for Jupiter and this week in *Science* for Saturn, show that "the two planets are more complex than we thought," says Ravit Helled, a planetary scientist at the University of Zurich in Switzerland. "Giant planets are not simple balls of hydrogen and helium."

In the 1980s, Iess helped pioneer a radio instrument for Cassini that delivered an exceptionally clear signal because it worked in the Ka band, which is relatively free of noise from interplanetary plasma. By monitoring fluctuations in the signal, the team planned to search for gravitational waves from the cosmos and test general relativity during the spacecraft's journey to Saturn, which began in 1997. Iess's group put a similar device on Juno, which launched in 2011, but this time the aim was to study Jupiter's interior.

Juno skims close to Jupiter's surface every 53 days, and with each pass hidden influences inside the planet exert a minute pull on the spacecraft, resulting in tiny Doppler shifts in its radio signals. Initially,

In Congo, fighting a virus and a groundswell of fake news

Laura Spinney

Science **363** (6424), 213-214.
DOI: 10.1126/science.363.6424.213

ARTICLE TOOLS

<http://science.sciencemag.org/content/363/6424/213>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2019 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works