

# ***Emerging Infectious Diseases* Cover Art**

[Announcer] *This program is presented by the Centers for Disease Control and Prevention.*

[Sarah Gregory] Today, I'm talking with *Emerging Infectious Diseases'* managing editor, Byron Breedlove, about the EID journal cover art.

[Sarah Gregory] Byron, you became managing editor of EID about three years ago. You followed in the footsteps of the illustrious Polyxeni Potter. She was founding managing editor of EID and creator of the iconic cover art and the accompanying stories for almost 20 years. As part of your new position you had to begin writing these cover stories. Was that intimidating?

[Byron Breedlove] Actually, the notion of suddenly immersing myself into both infectious diseases and art and finding connections between the two was terrifying. And intimidating. I've written hundreds of short articles but my skills as an essayist were a bit rusty.

[Sarah Gregory] How has your style and approach differed from Poly's?

[Byron Breedlove] I've read and admired Poly's work for years. She delved deeply into the art, culture, history, and place. She connects readers to the artists and their works by drawing upon her own knowledge of culture, technique, and personality.

I knew I could not emulate Poly's approach. Instead, I try to find layers of connections between the journal's theme for the month and the art. I try to describe what I see in the art, not to define it, but to offer readers a starting point in viewing the work. Linking the art and science in some rational way is the hardest part, and like Poly, I usually try to leave readers with some insight or idea that they would not have considered before.

I think Poly's essays are perhaps more self-contained, whereas I want readers to be intrigued a bit and to then go explore for themselves more about the artist, the art, and the science.

Another key difference is that I've written about half of my essays with coauthors, typically with scientists. The process of having a coauthor allows us both to try different ideas and approaches as we exchange drafts. It also provides some assurance that I will not embarrass myself when I am writing about complicated infectious disease topics.

[Sarah Gregory] How about the cover art pieces themselves? Has the kind of art used on the covers changed?

[Byron Breedlove] Yes and no. I rely less on, but still use, iconic images and works by well-known artists. Most of those works are cultural touchstones and need less introduction. But I also use artists whose works are less well known, as did Poly.

The journal's readership is getting younger, so I feel like we have to be willing to include different types of art that connects with those younger readers and that will still prove compelling to our long-time readers.

I've reached out to contemporary artists such as Alexander Skachkov, who creates amazing, whimsical images in Photoshop, Rogan Brown, who fashions elaborate monochromatic sculptures from layers of paper, and Pam Longobardi, who uses plastic debris she's removed

from beaches to create montages, and Edward Epp, who spent time teaching in Liberia and auctioned many of his works to support the Ebola relief work of Doctors without Borders.

[Sarah Gregory] What's the process you use for selecting and obtaining a piece of art?

[Byron Breedlove] I don't have a degree in art history, so when Peter Drotman, EID's editor in chief, selects a theme for an upcoming issue of the journal, I start thinking about what sorts of art would be appropriate. My first stop is often an online search to see what I can find.

In the past few years, a great deal of art has moved into the public domain and is open access. Our options are therefore greater because so much more art is now available for use at either no cost or for low cost.

I also talk with Dr. Drotman, who has an incredible knowledge of art as well as science, and I've consulted with Louise Shaw, curator of the CDC Museum.

[Sarah Gregory] Many people who are not involved in infectious disease still look forward to reading these cover stories. What do you see as the importance of the EID art and stories in relation to the journal, art, and science in general?

[Byron Breedlove] Linking microbiology, infectious diseases, epidemics, and various vectors to art, and vice versa, creates perspectives that can help humanize the science and offer a different way of seeing the art. I think it's somewhat intellectually dishonest to segregate the arts and sciences and act as though one is better or more important than the other. The connections between art and sciences are much stronger than the differences when one looks at them through a true liberal arts lens where grammar, rhetoric, logic, geometry, arithmetic, music, and astronomy are the basis of study and the point of learning is to analyze information, not just accumulate it. I hope these stories simply prove stimulating, perhaps entertaining, to anyone who spends a few minutes reading them.

[Sarah Gregory] Oxford University Press published a book of 92 EID cover art and stories in 2014, which is still available, titled, *Art in Science: Selections from Emerging Infectious Diseases*. Do you see a part two in your future?

[Byron Breedlove] The jury is out on many fronts. I am not sure how my work will be judged. Poly's timeless essays and her choice of artwork was groundbreaking. Perhaps if there is demand for part two, I can contribute a bit of a different perspective.

[Sarah Gregory] I believe you're going to read one of your cover stories to us now. Which one is it?

[Byron Breedlove] It's the one we just published today—the newest one for August 2017: *Hematophagous Endeavors, Fact and Fancy*. I wrote this one with my most frequent coauthor, Paul Arguin.

Let's start with some facts. The word "mosquito" is Spanish for "little fly." The single family Culicidae comprises more than 3,500 species of mosquitoes, and these ectoparasites are found in a wide range of environments spanning the globe with the exception of Antarctica. The life span of adult mosquitoes ranges from two weeks to six months.

Mosquitoes belonging to about three quarters of recognized species consume blood. Female mosquitoes of those species are equipped with tubular mouthparts that can pierce the skin of their human and animal hosts to consume blood. The blood provides them with protein to produce eggs. When they are not producing eggs, female mosquitoes typically consume the same things that males do, nectar and sap from a variety of plants. Male mosquitoes do not need to feed on blood and consequently have not evolved to have larger mandibles for piercing layers of skin.

Some mosquitoes spread disease-causing agents that have serious and widespread consequences for humans and animals. Mosquitoes transmit the five *Plasmodium* parasite species that cause malaria in humans and the infectious agents that can cause chikungunya disease, dengue hemorrhagic fever, Japanese encephalitis, lymphatic filariasis, Rift Valley fever, West Nile virus infection, and yellow fever. Of those, the illness that sickens and kills most people each year is malaria. For the year 2015, the World Health Organization reported 212 million new cases of malaria and an estimated 429,000 deaths from malaria worldwide.

Mosquitoes are not simply mechanical vectors or mobile fomites. Many pathogens complete stages of their life cycles within the mosquito or may have to move from the mosquito's gut to its salivary glands—which is often why mosquitoes are not immediately infectious after consuming a blood meal from the initial infectious host. This complex relationship helps explain why specific diseases and certain mosquitoes are linked; malaria and *Anopheles* spp., Japanese encephalitis and *Culex* spp., or dengue and *Aedes* spp.

Bill Gates wrote that “When it comes to killing humans, no other animal even comes close.” Science writer Jerry Adler noted in an article that “One species, the *Anopheles gambiae* mosquito, has been called the world's most dangerous animal, although strictly speaking that applies only to the female of the species, which does the bloodsucking and harms only indirectly.”

As we consider the facts, let's shift to fancy for this month's cover art, the *Old Mosquito*, by artist, illustrator, and web designer Alexander Skachkov. Much of his art belongs to realms of magic, whimsy, and wonder; his colorful creations often feature a wry sense of humor. He cites as inspiration the contemporary fantasy art created by Scott Gustafson, Paul Bonner, and Jean-Baptiste Monge. Art blogger Lafayette Wattles states that Skachkov “offers a fascinating mix of nature and humanity with neither being quite what we've come to expect in the real world.”

Although Skachkov is not working with bristle brushes and a palette of paints, his approach is nonetheless laborious and deliberate. Skachkov's creations, including this work, typically start with a penciled sketch that forms the basis of the finished image. He scans that drawing into Photoshop, with which he employs a range of tools, filters, layers, and effects to manipulate the textures, tones, and colors.

In this clever image, Skachkov depicts a tired older mosquito heading home after a long night of collecting blood. The bare branches and grayish fog of morning suggest that summer is past and the old mosquito is approaching the end of his days in the end of the year. The bright red blood contained in the mosquito's jug, his red hat and legs, and, of course, his blood-tipped proboscis tinged from its hematophagous endeavors, contrasts with the morning gloom.

Entomologists will be quick to point out that the depiction is scientifically inaccurate because male mosquitoes do not ingest blood. Mosquitoes also do not wear shoes and cute hats (so we

hope any entomologists reading this essay will allow the illustrator to exercise artistic license). Skachkov has depicted this recent blood collection not just as the mosquito's prized possession, but also as his burden. The mosquito is bowed with the weight of the bottle strapped on his back. Supported by a cane, he trudges along collecting blood in exchange for an itchy welt or worse—an infectious microorganism that can cause illness, disability, and death for its new host. His resigned expression suggests that our mosquito must be aware of the grim consequences of his actions but has no choice regarding his role in the world. With few friends and not much to smile about, this older mosquito will continue on his appointed rounds for as long as he can bear it.

Thank you, Byron. Listeners can read these intriguing EID cover art stories every month at [cdc.gov/eid](http://cdc.gov/eid).

I'm Sarah Gregory for *Emerging Infectious Diseases*.

*[Announcer]* For the most accurate health information, visit [cdc.gov](http://cdc.gov) or call 1-800-CDC-INFO.