A 1918 Flu Memoir

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My grandfather was an amazing man, biologically speaking. He lived until age 103, so healthy that family lore has it that his cancer-ridden prostate actually grew back, apparently normal enough to have enabled him to survive another few decades. He ate his favorite food, deep fried crabs, until the day he died, and he didn’t seem to have succumbed to anything in particular other than perhaps running out of ATP.

Grandpa Sam would amaze people with his memories of having seen Babe Ruth in action. But what always impressed me was his having survived the 1918 influenza pandemic that killed 50 million. My grandmother was his nurse—that’s how they met.

I remember clearly my grandfather teaching me how to blow my nose correctly, my sister and cousins happily spraying all manner of nasty pathogens around the circa-1960s kitchen in Brooklyn. As a child I’d wonder why and how he never had so much as a sniffle, given his constant exposures.

Years later, as a graduate student in genetics and entrenched in evolutionary biology, I began to suspect that his having survived the Great Influenza somehow reflected an exceptional immune response. Maybe other astonishingly elderly antibodies are what protected him against the various rhinoviruses and adenoviruses that cause the common cold, which he also never seemed to contract.

Over the years, I’ve met other senior citizens who survived the Spanish flu and then never suffered another respiratory infection, even in the face of repeated exposure. But my hypothesis remained anecdotal, until a news release landed in my e-mail a few minutes ago. The headline instantly caught my attention: “Survivors of 1918 flu pandemic protected with a lifetime immunity to virus.”

Can you say “I told you so” to an announcement of research results?

Tracking down facts about the 1918 flu brought to mind various overly dramatic TV movies and novels about digging up frozen bodies in search of the virus. Most of what we know of the deadly H1N1 influenza virus comes from the laboratory of Jeffery Taubenberger, Chief of Molecular Pathology at the Armed Forces Institute of Pathology in Washington, D.C. Back in 1997, his team pieced together nine fragments of the virus remaining in a single, preserved lung. The victim was a young soldier, one of many whose formalin-fixed, paraffin-embedded, hemotoxylin-and-eosin stained tissue was preserved at the Institute. The researchers cleverly chose their sample. After analyzing more than four dozen lungs, they zeroed in on this one young man who had an interesting anatomical discrepancy—a lung exhibited the secondary bacterial pneumonia that killed most of the victims outright. But the second lung had only the beginnings of the initial viral assault. By probing this tissue with RT-PCR, the researchers were able to isolate and amplify pieces of the virus. Its sequence confirmed the porcine and avian origins, for the deadliest flu strains descend from a mixing of viral subtypes that usually occurs in the throat of a pig.

The news release announced a report in the advanced online issue of *Nature*, from researchers at Vanderbilt University, the Mount Sinai School of Medicine, the University of Medicine and Dentistry of New Jersey, the Centers for Disease Control and Prevention and The Scripps Research Institute. These investigators took a different approach. Instead of probing the dead, they sought out folks like my grandfather who lived to tell the tale.

Christopher Basler, PhD, Associate Professor of Microbiology at Mount Sinai School of Medicine, explained the approach. “Ninety years after survivors encountered the 1918 pandemic influenza virus, we collected antibody-producing B cells from them, and successfully isolated B cells that produce antibodies that block the viral infection. The antibodies produced by these cells demonstrated remarkable power to block 1918 flu virus infection in mice, proving that, even nine decades after infection with this virus, survivors retain protection from it.” They probed the B cells of 32 survivors of the pandemic.

If human memory B cells work this well, one wonders what an elephant’s might be able to do. More importantly, this telling study should inspire researchers to look further into the echoes of past infections that are imprinted in our memory B cells for clues that may show us how to prevent a repeat performance of the 1918 flu. The story of the 1918 flu survivors is another powerful example of evolution in action.

REFERENCE