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Ebola outbreak began at healer's funeral according to study

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Pictured above is a colorized image of an Ebola virus virion. Credit: Centers for Disease Control microbiologist Frederick A. Murphy.

The current Ebola outbreak sweeping through West Africa likely began at the funeral of a healer in Sierra Leone, according to an extensive genomic study of the virus published in *Science*.

"The funeral was for an herbalist or traditional medicine practitioner in Koindu, a town in Sierra Leone," says Robert Garry, a professor of microbiology and immunology at Tulane University, who co-authored the study with colleagues from Harvard University, the Broad Institute of MIT and researchers in Sierra Leone. "The herbalist had treated several patients from neighboring Guinea, one or more of whom were

apparently infected with Ebola virus."

Scientists were able to sequence 99 Ebola virus genomes using blood samples from 78 patients, painting a record "real-time" snapshot of how the virus rapidly mutated as the outbreak spread. The analysis showed that the West African Ebola strain was distantly related to a strain that has been circulating in central Africa for decades, but likely migrated to the region in 2004. Scientists found 300 mutations that differentiate the viral genomes involved in this outbreak from previous outbreaks, Garry says.

"This is first study to document deep viral genomics during a human outbreak of a hemorrhagic fever like Ebola," Garry says. "We get a close look at not only how the virus is evolving as it passes from one person to the next, but also how the virus changes as it replicates within a person."

The results can help researchers as they work to develop antibody-based treatments using the genetic profile of the virus. They also help improve the accuracy of diagnostic tests.

"The diagnostics used in the field are polymerase chain reaction (PCR) based," Garry says. "PCR depends on finding precise matches between a synthetic primer and the viral genome. If the virus genome mutates, the PCR assay may not work or not work as well."

More information: "Genomic surveillance elucidates Ebola virus origin and transmission during the 2014 outbreak." Stephen K. Gire, Augustine Goba, Kristian G. Andersen, Rachel S. G. Sealfon, Daniel J. Park, Lansana Kanneh, Simbirie Jalloh, Mambu Momoh, Mohamed Fullah, Gytis Dudas, Shirlee Wohl, Lina M. Moses, Nathan L. Yozwiak, Sarah Winnicki, Christian B. Matranga, Christine M. Malboeuf, James Qu, Adrianne D. Gladden, Stephen F. Schaffner, Xiao Yang, Pan-Pan Jiang, Mahan Nekoui, Andres Colubri, Moinya Ruth Coomber, Mbalu

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