

Massive genetics research facility tackles Ebola

An old two-story brick building in a shabby part of town, formerly a distribution center for Budweiser beer, is now the world's most powerful factory for analyzing genes from people and viruses.

And it is a factory. At any given time, 10,000 tiny test tubes each holding a few drops of gene-containing fluid are being processed by six technicians, working 24 hours a day, 365 days a year — two on the night shift — using 50 dishwasher-sized machines in two large rooms.

The machines spit out sequence data onto a computer screen in the form of a long list, in order, of the letters that make up genetic material. That is three billion letters if the genes are from a person. Another 64 technicians do the more labor-intensive work of preparing the samples for analysis.

It is all in service of researchers who work for the Broad Institute, a gleaming, lavishly endowed [genetics](#) center a few blocks away. The sequencing center has worked on human DNA from an international effort, [the 1,000 Genomes Project](#), that looks at the genes of thousands of people from around the world. It has gotten sequences of microbes, like [dengue fever](#), [malaria](#) and [West Nile virus](#). It has gotten genetic sequences from animals like chimpanzees.

And it is here that Broad scientists studying [Ebola](#) and a similar deadly disease, Lassa, send their samples, taking advantage of what the center's manager, Andrew J. Hollinger, referred to as superfast track sequencing in their urgent work on these [diseases ravaging West Africa](#). Those scientists receive their sequence data in about 40 hours, compared with days for the usual work.

The Ebola and Lassa group, led by Pardis Sabeti, wants to know what the viruses look like. Do they mutate while they are infecting people, possibly evading the immune system? Are some strains more deadly than others? And what about the genetics of the people who are infected? Are some people more resistant, perhaps even immune, to these viruses because of tweaks in their own genes?

The research is emblematic of a new direction in public health, which uses powerful genetic methods and applies them to entire populations.

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