

The significance of populational diversity

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When the major human genome sequencing projects began in the late 20th century, the belief was that the differences in the genetic composition of different individuals would be minimal. Therefore, to reach the goal of a complete reference genome, little attention was paid to the populational diversity in the samples to be sequenced.

It turned out that humans have far fewer genes than expected and that they are not the key to the differences between individuals. Technological advances have made it possible to identify millions of minor changes to the genome—variations that can alter the form and function of proteins or the pattern of activation/deactivation of the genes that they encode. They can be common to populations and have important consequences for public health, such as the propensity to develop a certain disease or how different organisms react to certain medications.

An article published in *Science* last May sequenced the genomes of 2.7 thousand people from all parts of Brazil. Not only do the results allow a deeper understanding of the genetic diversity of the population, but they also support Brazilian efforts toward precision medicine and its availability in the national health system (page 6).

Genetic diversity is also at the heart of another feature, but the subject is cassava, not human genes. Certain cultivation practices used by indigenous peoples such as the Waurá are important for the maintenance of genetic varieties and for guaranteeing food security (page 37). This edition also offers a diversity of themes, such as research revisiting the works of Jorge Amado (1912-2001), one of the best-known Brazilian writers abroad (page 58). The technology section offers views from above: nanosatellites for locating shipwrecks

(page 57) and radar-equipped drones that can monitor crops or scan for anthills or buried skeletal remains (page 40).

The May edition of *Pesquisa FAPESP* in Portuguese featured an interview with the philosopher Luiz Henrique Lopes dos Santos of the University of São Paulo. A researcher in the field of logic, Lopes dos Santos has a long track record as an advisor to the Scientific Directorate of FAPESP, the São Paulo Research Foundation. He helped create various research programs, and for 21 years, he was the scientific coordinator of this magazine. It is difficult to summarize his importance in the construction of this publication's identity. Shortly after granting this interview, Lopes dos Santos was diagnosed with cancer; he passed away last July. His legacy in our newsroom is the daily quest for quality writing combined with scientific accuracy, with a view to engaging a wider audience (page 16).

As we prepare this edition for print, COP30 is taking place in Brazil for the first time. Covering the science behind climate change has always been a staple part of our work. One example is the feature on research that highlights the importance of aerosols, a type of particle, in cloud formation (page 44). It has been known for some time that aerosols accumulate over the Amazon rainforest. A recent study revealed that isoprene, a gas emitted by trees as a thermal regulatory mechanism, accelerates the formation of these particles, which can travel thousands of kilometers and become cloud seeds.

This international edition features a selection of articles originally published in Portuguese between January and June 2025. New content in English is published monthly on our website (revistapesquisa.fapesp.br/en/).