

# New library of human stem cells with the Brazilian genetic admixture

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Most lines of human pluripotent stem cells (hPSC) reported worldwide are derived from people or embryos with European or East Asian ancestries. An article published on October, 6, at the journal *Scientific Reports* - from the Nature group - announces 23 new lines of hPSC with different levels of admixed European, African and Native American genomic ancestry. The library can be expanded to 1.877 cell lines and was established by the researchers of the National Laboratory of Embryonic Stem Cells (LaNCE), from the Center for Cell-Based Therapy (CTC), at the University of São Paulo, Brazil.

Eighteen hPSCs lines have an European genomic contribution ranged from 14.2% to 95%, while African ancestry ranged from 1.6% to 55.1%, and Native American ancestry ranged from 7% to 56%. They were derived from peripheral blood of participants of The Brazilian Longitudinal Study of Adult Health (ELSA-Brazil), a large cohort study of 15,015 Brazilians focused on assessing incidence and risk factors for diabetes and cardiovascular diseases in the country. The other five cell lines were established from surplus human embryos generated for reproduction purpose. Their European genomic component ranges from 92.7% to 98.6%.

## Differentiation and gene information

It was possible to determine the ancestry for specific physical locations in the genome of the cells. The investigations targeted the genes

belonging to the Cytochrome P450 Family (CYP), known for its role in drug metabolism. They found high heterogeneity of ancestry among the hPSC lines.

Besides the genomic ancestry analysis, the scientists also evaluated the [cell lines](#) pluripotency. They were successfully differentiated in vitro into tissues from the three embryonic germ layers.

## **Response to drugs and mechanisms of diseases**

The response to drugs can vary from population to population and even between specific groups of people, making it very expensive to test a potential new drug among different populations across the world before approving it for use. In the paper, the researchers suggest that "collections of hPSCs with different genetic backgrounds must be used to dissect the molecular basis and to develop cell based assays of differential drug toxicity and efficacy."

Lygia da Veiga Pereira, geneticist from the Center for Cell-Based Therapy, professor at University of Sao Paulo and senior-author of the article, points that tests with these cells can be performed before clinical essays and, in some cases, they can even replace animal models in drug development pipelines.

Another interesting purpose is to study cellular and molecular process of diseases like mental disorders, coronary heart disease, diabetes and hypertension. The blood samples from the ELSA-Brasil cohort study are connected to the clinical data of the participants. There can be generated cells from specific tissues of patients with diabetes, or even from the 11% drug-resistant patients with hypertension, as examples.

**More information:** Fabiano A. Tofoli et al, Increasing The Genetic Admixture of Available Lines of Human Pluripotent Stem Cells,

*Scientific Reports* (2016). [DOI: 10.1038/srep34699](https://doi.org/10.1038/srep34699)

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