

Moving beyond race in pharmacogenomics?

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By

There's been a bit of news coverage over the past week of a commentary article in *Clinical Pharmacology and Therapeutics* that argues for "[Individual Genomes Instead of Race for Personalized Medicine](#)," on the basis of the sequenced genomes of [J. Craig Venter](#) and [James Watson](#). The genomes of both men were sequenced and have been made publicly available [relatively recently](#); you may recall that several months after Watson's infamous comments about [race and intelligence](#), an analysis by deCODE Genetics showed that Watson's genome contained "[16 times the number of genes considered to be of African origin than the average white European does](#)."

Geneticists and medical researchers who use racial categories in their research often argue that race is simply a [proxy](#) for more specific genotypes shared by particular populations. The *Clinical Pharmacology* article — co-authored by Venter — underscores the degree to which racial categories (and specifically the Census-based racial and ethnic categories [mandated](#) in US government-funded clinical research) are a very unreliable proxy for genotypes.

The authors write:

[R]ace/ethnicity should be considered only a makeshift solution for personalized genomics because it is too approximate; known differences may occur within a defined category. One example of such variability is provided by CYP2D6, which is involved in metabolizing codeine, antipsychotics, and antidepressants. The CYP2D6*17 form has moderately lower enzymatic activity than the wild type. However, different populations within Africa can have different frequencies for a variant. The *17 allele in CYP2D6 is found in 9%, 17%, and 34% of the Ethiopian, Tanzanian, and Zimbabwean populations, respectively. Clearly, lumping together all of Africa obscures the differences between the populations. The label "African" or "African-American" is therefore insufficient to determine whether an individual comes from a population with a high frequency of the *17 allele.

Examining the genomes of James Watson and J. Craig Venter, the authors continue:

Although both men are self-identified Caucasians, their DNA sequences for these genes differ...For example, Dr. Venter has two fully functional alleles in CYP2D6 and is an extensive metabolizer, whereas Dr. Watson is homozygous for the *10 allele, which has moderately lower activity and is an intermediate metabolizer. This *10 allele is rare in the Caucasian population (3%) but prevalent in East Asian populations... Yet Dr. Watson's genotype predicts that he is likely to differentially metabolize drugs such as antidepressants, antipsychotics, and the cancer drug tamoxifen. This speaks to the value of knowing genomic sequence instead of relying on a patient's appearance or self-identified ethnicity. It is unlikely that a doctor would guess that optimal drug dosages might differ for Drs. Watson and Venter without knowledge of their genetic data or extensive medical histories.

The article seems to affirm the sense that we are moving beyond the use of racial categories in genetics research, closer to "personalized medicine" — and this is exactly how it has been reported in venues such as [New Scientist](#) and [Slate](#) (the latter article written by William Saletan, who caused an uproar with [previous](#) columns on race and genetics).

On the one hand, it seems that there is little new to the argument: we've heard for a long time (from Lewontin and others) that genetic differences within sociologically-relevant racial groups are greater than those between them. Are we finally seeing mainstream genetics and medical researchers coming around to this view?

The article by Venter and his colleagues portrays this shift as the result of technological changes:

Because the cost of genotyping and sequencing has decreased dramatically in the past few years, we no longer need to guess the genetic makeup of an individual. With current technology we can definitively determine a million genotypes for an individual in a matter of days, and this will only improve as technology advances.

To me, this foregrounds the obvious: "personalized medicine" is a consumer-driven enterprise. Clearly we will see great disparities in the availability and accessibility of this technology. How these will interact with

existing racially-shaped health disparities is an open question, but I doubt that it will lead to the disappearance of race as a category ascribing genetic difference (as opposed to a category describing social difference) in medical research and practice.

Given that this is another topic which is far outside my own area of research, I would be particularly interested to hear what medical anthropologists, sociologists and other researchers working on issues on genetics and race in medicine, make of the Clinical Pharmacology piece.

We've already linked to one new book ([Revisiting Race in a Genomic Age](#)) on this topic, but for those who are new to these issues – at least as they have been taken up in anthropology and the social sciences – here are a few links providing background on the problematics of race and ethnicity in medical research and in clinical practice.

* indicates an article which requires a subscription to access

Troy Duster. [Race and Reification in Science](#). Science. February 18, 2005*

Ian Hacking. [Genetics, biosocial groups and the future of identity](#). Daedalus. Fall 2006.

Lundy Braun et al. [Racial Categories in Medical Practice: How Useful Are They?](#) PLoS Medicine. 4(9), 2007

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Jonathan Kahn. [Race in a Bottle](#). Scientific American. July 2007

Duana Fullwiley. [The Molecularization of Race: Institutionalizing Human Difference in Pharmacogenetics Practice](#). Science as Culture. 16(1):1-30. 2007*

Michael Montoya. [Bioethnic Conscriptio: Genes, Race, and Mexicana/o Ethnicity in Diabetes Research](#). Cultural Anthropology. 22(1), 2007.*

Sandra Soo-Jin Lee. [Racializing drug design: Implications of pharmacogenomics for health disparities](#). Am J Public Health. 2005

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Ian Whitmarsh. [Biomedical Ambiguity: Race, Asthma, and the Contested](#)

[Meaning of Genetic Research in the Caribbean.](#) Cornell UP: 2008.

Sally Satel. [I Am a Racially Profiling Doctor.](#) New York Times, May 5, 2002

[Is Race "Real"?](#) A web forum hosted by the SSRC, with contributions from [Alan Goodman](#), [Richard Lewontin](#), [Jonathan Marks](#) and others.

AMA citation

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MLA citation

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