

## The pitfalls of tracing your ancestry

**Charmaine Royal of the Duke Institute for Genome Sciences and Policy explains the limitations of genetic testing.**

Brendan Maher

Ancestry testing is genetics' most direct and sometimes tempestuous interaction with personal identity. An estimated half-a-million Americans will purchase genetic tests from companies this year and thousands more will participate in university research where such tests will be used. The tests raise ethical and legal questions, on which an 11–15 November meeting of the American Society of Human Genetics (ASHG) in Philadelphia, Pennsylvania, hopes to provide some guidance.

Charmaine Royal, an associate professor at the Duke Institute for Genome Sciences and Policy in Durham, North Carolina, who co-chairs a task force — looking at genetic ancestry testing — at the meeting, talks to *Nature*.

### What prompted the ASHG to develop these recommendations?

People have been researching their ancestry forever, using stories and historical records, and people have taken advantage of genetic technology with the hope of learning more. But there's this perspective that genetics provides the truth, and that may need to be challenged. In general, genetic ancestry testing is fallible just like many of the tools we use. Some people think that genetics will provide the be all and end all of information about their ancestry. There are limitations as to what ancestry can provide.

### What kinds of tests are available?

There are the biogeographical ancestry tests, which use ancestry-informative markers. Those tests give people a percentage of European, sub-Saharan African, East Asian and Native American ancestry. Then there are lineage tests that will give people information about their maternal lineage — these are the mitochondrial-DNA tests. Then the Y chromosome test tells them about their paternal lineage.

### What are the limitations of such tests?

The general limitation, I'd say, of all of these tests, is that they can't pinpoint with 100% accuracy who your ancestors may or may not be. Some people are concerned that the biogeographical ancestry test reifies the notion of race. This is the notion that there are four or five parental groups from which we all came and there are discrete boundaries between these groups. But our genetic research has shown that those boundaries don't exist.

In lineage testing, where someone is wanting to know which tribe or region in Africa they came from, the information that's given is based on the present day populations. The names of those groups and those locations have changed over time and so people getting that information about present day Africans and extrapolating to who their pre-middle-passage ancestors may have been — that may not necessarily be accurate. So, those limitations need to be clarified.

Another limitation is that the outcomes of ancestry tests are very much dependent on what is already in a database — who a client's DNA can be matched to. If a database is not comprehensive some potential matches will be missing, and nobody has a complete database. That's a major limitation, probably one of the biggest.

### Can the results of ancestry tests be distressing for people?

There have been news reports about people who have had adverse reactions to their results. One of the cases I've cited and talked about is Wayne Joseph [a self-identified African American man who found out from a genetic test that he had no African ancestry].

When we talk about psychological responses and emotional distress, there are varying degrees of that. Primarily, it is people who have some notions about who they are, and are going into this just for confirmation. Some of those people respond negatively. Then again there are lots



Charmaine Royal is co-chairing a task force looking at ancestry tests.

*C. Royal*

of reports about people who have a good response to this even if the information conflicts with what they know.

Some people go into it to try to get this information to claim certain rights from certain groups and they don't get that and that disappoints them. My observation is that the responses to the test results are very much related to the motivations of people taking the test in the first place.

### **So what does that mean in terms of how these tests should be delivered?**

Our recommendations in that regard pretty much talk about the need for assessing the implications for people, families and populations who are getting this information. And guidelines do need to be set up to facilitate better explanation and counselling. Some direct-to-consumer companies that do health-related testing have come up with creative ways of incorporating counselling. That will probably be needed to a lesser extent in the ancestry enterprise, but there's concern that it should at least be available.

### **How could your guidelines be enforced?**

One of our recommendations talks about accountability of the direct-to-consumer ancestry testing industry. We need to develop ways for greater accountability of those companies. This is a major issue and one that will require input from various entities. That's part of our future work.

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Posted by: **Thierry Cartier** | 14 Nov, 2008

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Posted by: **Thierry Baussant** | 17 Nov, 2008

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