Genetic testing for sports genes courts controversy

by Rob Stein, The Washington Post
May 18th, 2011

In an era of helicopter parents eager to exploit every competitive edge for their children, at least two companies have begun selling tests that claim to help match youngsters with the sports they are genetically programmed to play best.

The DNA scans, the first of an expected wave of attempts to use genes to enhance athletic performance, can steer children toward games they are most likely to win — and perhaps get scholarships to play, the companies say. The tests also let children — and adults — tailor workouts to their innate skills, the firms say, as well as spot those prone to life-threatening heart problems, concussions and other injuries.

"The main purpose of the test is to maximize performance in the minimum amount of time and minimize risk," said Bill Miller, chief executive of American International Biotechnology Services in Richmond, which began selling the test three weeks ago.

Critics, however, see the kits as the latest in a flood of questionable genetic tests that entrepreneurs are hawking. No one can accurately gauge the influence of genes on athletic abilities or vulnerabilities, they say. The results may be needlessly alarming or falsely reassuring, they say. Skeptics also fear that the trend will encourage overzealous parents and coaches to push kids into sports they dislike or discourage them from physical activities they enjoy — and might succeed at — despite their genes.

"This is really disturbing," said Lainie Friedman Ross, a pediatrician and bioethicist at the University of Chicago. "Sports and physical activity should be fun for kids. It shouldn't be, 'You're going to be the world's greatest athlete' or 'Give up now, kid, because you won't have a chance' because of your genes."

FDA as referee?

The growing availability of mail-order DNA scans has spurred excitement about finding genetic clues to ancestry, health and proclivities. But the testing has also raised alarm because genetic data can be misleading, misinterpreted and misunderstood, and it can leave consumers vulnerable to discrimination by employers and insurers.

The plethora of tests has prompted the Food and Drug Administration to begin stepping in, causing one company last year to abandon plans to sell a genetic screen at Walgreens stores, others to discontinue offering tests directly to consumers and some to begin working with the agency to validate their methodology.

On May 11, the FDA sent Miller a letter demanding justification for marketing his Sports X Factor test without the agency's authorization.

"If you do not believe that you are required to obtain FDA clearance or approval for the Sports X Factor Test Kit, please provide us with the basis for that determination," wrote James L. Woods of the FDA's office of in vitro diagnostic device evaluation and safety. The firm plans to meet with the agency Friday, a spokesperson said.

'This is just a tool'

Another company, Atlas Sports Genetics of Boulder, Colo., was the first to offer athletic DNA testing in the United States. For $169, Atlas sells an Australian lab's test that analyzes a gene that controls a key muscle protein. The ACTN3 protein can make muscles better at producing quick bursts of power.

"A lot of people get confused and think we're saying this can tell you whether you or your child will be the next Michael Jordan," said Nat Carruthers, Atlas's president of operations. "It doesn't tell you that. But it will tell you whether you are producing this protein and whether you are predisposed to be good at a sprint sport or an endurance sport."

The results, obtained by mailing to a lab a saliva sample swabbed from inside a cheek, can help active people maximize their workout regimens and sports choices based on their muscle type, Carruthers said.

"If someone trying to run marathons says, 'I'm trying to do all the endurance training, but it's just not working out. I can't keep up with the workouts,' or they are trying to lose weight and they say, 'I'm going to the gym and I just can't do these..."
workouts,’ we can say, ‘You need to train in a different way,’ ” Carruthers said.

Bradley Marston of Bountiful, Utah, had his 10-year-old daughter, Elizabeth, tested last year because he was curious to learn more about why she excelled at soccer.

“I already knew she had that something special. This is just a tool to help me determine what to do with her strengths as well as some of her shortcomings,” Marston said.

Elizabeth’s test indicated that her muscles are predisposed more to quick spurts of power than to long trials of endurance.

“I am not the type of father or parent that is pushing my daughter to succeed. It’s not all about winning. The focus is about having fun. This tool can just help us,” Marston said.

**Genetics of performance**

Although the ACTN3 gene has been linked to enhanced performance among some elite sprinters, it does not seem essential to Olympic-level athletics.

“It looks like the gene does contribute something, but only a very small amount at the very, very elite levels,” said Stephen M. Roth, who studies the genetics of physical performance at the University of Maryland. “For 99 percent of the world, it does not matter.”

More recently, American International began screening for the ACTN3 gene, as well as six others that the company says influence strength, energy and endurance. In addition, the $200 test checks cheek swabs for variations of three genes that the company says can signal risks for fatal heart muscle and rhythm emergencies. Sports X Factor can also supposedly identify those who are vulnerable to concussions and need more rest after suffering a head injury to minimize the risk of brain damage.

**Targeting children**

“One of the main target audiences is kids,” Miller said. “We want to make sure they are not out there blindly playing with one of these mutations and have a heart attack or a concussion. It gives parents peace of mind that their kid is not going to drop dead in the middle of a workout.”

Critics, however, argue that too little is known about the genes in the test panel to reliably interpret the results.

“If the test comes back negative, the parent might say, ‘Put them back in,’ ” said Carl Foster, a professor of exercise and sports science at the University of Wisconsin at La Crosse. “If you get your kid back into competition too quickly and he gets another concussion, the kid is dead now.”

Several experts expressed concern about including the gene called ApoE for information about concussions. ApoE plays a role in Alzheimer’s disease, which means youngsters excited about tomorrow’s soccer game and their parents may find out that they are at risk for a devastating brain disease decades later.

“I think this company is a good advertisement for the need for more regulation of … genomic testing,” said Hank Greely, a Stanford University lawyer and bioethicist.

Despite such concerns, one of American International’s first clients was Ryan Muetzel, who was trying it out for clients at his Athletes Edge private training company in Boca Raton, Fla. Muetzel’s test concluded that he’d be good at track and field but prone to knee injuries — all of which he said is true.

“If kids are trying to get college scholarships, or just be happy and successful, what is going to make them happy?” he asked. “No one wants to be the worst kid on the team.”

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What does gene does Atlas Sports Genetics test for?
How much does the test cost?
What does this gene allow muscles to do?