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Regulation and guidance on genomic cancer tests inconsistent

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The rapidly evolving nature of genomic testing for cancer inevitably makes any examination of its current status obsolete almost as soon as it is announced. With the considerable confusion around the proper role of the US Food and Drug Administration (FDA) in the regulation of genomic testing, professional organizations have stepped into the void, assessing and recommending tests across a spectrum from germ-line to tumor testing and from laboratory-developed tests for rare forms of cancer to broad multigene risk-assessment tests. For instance, the National Comprehensive Cancer Network (NCCN) recently chose to endorse only one genomic tumor test for use in patients with early-stage breast cancer. That test—Oncotype DX, a 21-gene assay from Genomic Health—is among 45 tests systematically reviewed by a multidisciplinary group seeking a better understanding of the tests' endorsement trajectory. Chang et al. examined how recommendations agreed or disagreed across recommendation sources and compared these recommendations with the tests' FDA-approval status. Of the tests studied, 18 had two or more groups weighing in on their appropriateness, with only 67% agreement. Yet only five had FDA approval, with an additional five receiving FDA "clearance," a category for medical devices deemed substantially equivalent to an already approved product. Given the confusing regulatory milieu, the authors found disagreements among endorsing groups problematic when clinicians are trying to make decisions about the appropriateness of ordering gene tests for patients. *—Karyn Hede, News Editor*

Despite newborn screening, some infants with sickle cell disease at higher risk of death

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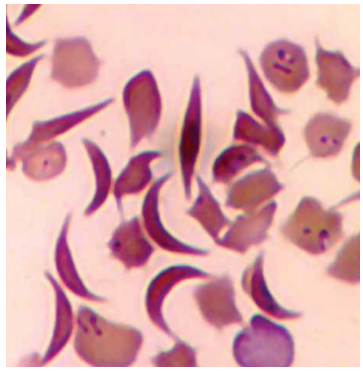

Children born with sickle cell disease in New York are at higher risk for death despite recent advances in reducing mortality, according to a Centers for Disease Control and Prevention–funded long-term follow-up study. Wang et al. report that children with low birth weight and those with US-born mothers were at highest risk of premature death, based on data obtained from birth and death certificates provided by New York state authorities. In New York, 1 in 230 newborns born to non-Hispanic black mothers and 1 in 2,320 newborns born to Hispanic mothers are diagnosed with sickle cell disease, figures that are higher than the national average. Researchers followed 1,911 newborns born between 2000 and 2008 and identified 21 deaths, 12 of which were attributed to sickle cell disease. Low birth weight conferred a significantly higher (ninefold) mortality rate among children with sickle cell disease, compared to those with normal birth weight. Similarly, children with US-born mothers had a higher risk of death than children of foreign-born mothers (3.1 vs. 1.2 per 1,000 person-years; $P = 0.05$). However, putting those figures into perspective, children born with sickle cell disease during the study period had a much lower risk of death than children born only 10 years earlier. The investigators attributed the low mortality rates to interventions that include earlier diagnosis, parental education, and standardized preventive measures such as penicillin prophylaxis, hydroxyurea administration, and pneumococcal immunization. *—Karyn Hede, News Editor*

NEWS BRIEFS

Genomic clinical trial recruiting takes to Facebook

Need clinical trial study subjects? There's an app for that. Researchers at the University of Michigan are hoping that using the social media site Facebook will help them reach tens of thousands of potential new study subjects for a clinical study loosely defined as a search for gene–environment interactions. The Genes for Good Facebook app is the primary recruiting tool for the study, which asks participants to send in a sample

of saliva and periodically fill out online health forms in exchange for information about genetic heritage and ongoing access to the study's health mapping tools.

To participate, subjects must be adult US citizens who agree to answer detailed questionnaires not only about health history but also about "habits, attitudes, and relationships," according to the researchers' website (http://genesforgood.sph.umich.edu). The investigators offer to return information about genetic ancestry, including access to an interactive map with information about individual migration patterns of maternal and paternal ancestors. As an added enticement, they offer to tell participants whether they harbor Neanderthal DNA. In an interesting twist, they also offer participants the

NEWS BRIEFS *(continued)*

ability to download their raw genetic data. Study leader Gonçalo Abecasis, professor of biostatistics at the University of Michigan, told BuzzFeed News that the Facebook app is simply a portal and that Facebook will not have access to volunteers' personal information. The idea is to reach people where they already gather and share information. At this stage, the researchers will not share any information with participants about their potential risk factors for disease, but they are not ruling out adding that element in the future, the prospect of which could raise some interesting ethical issues.
—Karyn Hede, News Editor

To uncoil DNA, try "walk the dog"

Just as DNA's familiar spiraling double helix arises from its precise chemical makeup, so too its tightly coiled nucleosomes wind like a yo-yo, uncoiling in one direction, according to new research on the physics of DNA packing. DNA, it turns

out, has a definite preference for the direction in which it uncoils. The study, published in March 2015 in the journal *Cell*, provides evidence that the force required to tug DNA from its nucleosome core using optical tweezers increases or decreases depending on which end is pulled. The research team found that, like the string wound around a yo-yo, DNA uncoils when pulled in one direction and winds itself more tightly when pulled in the other direction. Principal investigator Taekjip Ha, a member of the Carl R. Woese Institute for Genomic Biology at the University of Illinois, said in a news release accompanying the article that "many people thought we should have known this many decades ago, but there are still surprises in the physics of DNA." The study investigated how DNA balances two requirements: flexibility and stability. A yo-yo needs just the right string tension to be able to do tricks like "walk the dog." Similarly, a DNA molecule must be stable enough to coil neatly into its nucleosome core but retain enough flexible stretchiness to be able to uncoil when needed to make proteins. The researchers found that DNA's base sequence can influence how tightly it is wound, suggesting that mutations may affect DNA flexibility, which in turn may affect how easily it can be unwound when needed. Ha's research team next plans to determine the flexibility of an entire genome, creating the first genome-wide map of the physical properties of DNA.
—Karyn Hede, News Editor