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Bruce H. Andrews, Deputy Secretary  
U.S. Department of Commerce  
Washington, DC 20230

Dear Deputy Secretary Andrews,

This letter follows up on our conversation from last year about possible commercial conflicts at the National Institute of Standards and Technology (NIST) in forensic DNA technology.

NIST's mission is to "promote U.S. innovation and industrial competitiveness ... in ways that enhance economic security and improve our quality of life." Key to NIST's core values is "integrity" – being "objective, ethical, and honest."

There has been a systematic failure in forensic science over the last twenty years, notably with DNA mixtures (i.e., evidence containing two or more people). Crime laboratories generate excellent mixture data, but do not interpret the data properly. The result has been incorrect DNA match statistics, or no statistic at all, adversely affecting hundreds of thousands of criminal cases. When science fails in the courtroom, justice fails as well.

Cybergenetics is an innovative small business in Pittsburgh, PA. We solved the mixture interpretation problem in 1999, mathematically "unmixing" DNA data. After a decade of statistical refinement, our TrueAllele® computer technology has now been used in criminal cases in most states. Over thirty TrueAllele validation studies, seven published in peer-reviewed journals, establish the system's accuracy. TrueAllele works objectively, without having human analysts adjust the data or peek at a defendant's genotype.

There are a dozen other software programs for calculating match statistics for DNA mixtures. Some can correctly analyze simple mixture data. However, they become inaccurate with too many people in the mixture, or too little DNA. This failure is due to overly simplistic statistical models. Limited modeling requires human operators to choose their input data; discarding evidence biases software results.

NIST has been involved with DNA mixtures for a long time. In 2005, for example, they rang the alarm about inaccuracy in FBI DNA mixture statistics. In 2013, they showed such FBI methods had an unacceptably high false positive rate, potentially leading to wrongful DNA convictions. NIST recently assumed and expanded a national forensics regulatory role, helping to create a level playing field for all mixture software.

NIST scientists have considerable expertise in generating DNA data, but are not experts in advanced statistical mixture interpretation. They therefore rely on outside scientists for assistance. That reliance has led to a very close relationship between NIST and forensic scientists at the Institute for Environmental Science and Research (ESR), a New Zealand business. ESR develops and commercializes their new “STRmix” software product for DNA mixture statistics. STRmix improves on the FBI’s old DNA statistics, but shares the accuracy and objectivity limitations of more recent mixture analysis software.

The foreign company ESR has a special status at NIST. Here are some examples, drawn from a much longer list:

1. A principal STRmix software developer and marketer has been embedded in the Gaithersburg campus since October of 2014 as a NIST guest researcher. This ESR employee has close ties with NIST scientists, and influences their views on the technology landscape.
2. NIST has publicly compared Cybergenetics TrueAllele with ESR’s STRmix, making errors about TrueAllele methods and results. NIST’s mistakes favored their STRmix colleagues, and falsely deprecated TrueAllele. Despite repeated requests, NIST declined to retract its one-sided errors.
3. NIST results presented at a scientific meeting showed poor STRmix performance relative to TrueAllele. NIST tried to suppress their own results, asking Cybergenetics and others to not disseminate NIST’s comparison.
4. NIST told Cybergenetics it could not collaborate with them on scientific studies, so as to avoid a commercial conflict of interest. However, NIST collaborates with ESR scientists on similar topics, jointly publishing their research.
5. NIST told Cybergenetics it was unable to present talks or workshops with them, since that could appear to be a conflict of interest. But NIST regularly presents programs with ESR scientists, activities that help promote STRmix.

NIST values integrity, but its actions in the mixture arena over the last few years appear to undermine its objectivity as a DNA regulator. The closeness between NIST and ESR is apparent to the forensic DNA community. This special relationship between your agency and a large foreign company may have unlevelled the playing field for a small American innovator. The impact goes far beyond commerce, since widespread usage of weak crime-fighting DNA technology affects justice for all Americans.

If NIST is to continue playing a role in forming national forensic policy, it must be viewed as a fair broker. Otherwise, its integrity may be questioned as less than entirely objective, ethical or honest, vitiating its mission and goals. In the interests of Cybergenetics, the Department of Commerce, and the American people, I think it would be helpful if we began a dialog to get to the bottom of this possibly unfair government intervention on behalf of a foreign firm.

Sincerely yours,

A handwritten signature in blue ink, consisting of a stylized, cursive 'M' followed by a series of loops and a final flourish.

Mark W. Perlin, PhD, MD, PhD  
Chief Scientist and Executive