Summary of Opinions

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I. Introduction and Summary of Qualifications

1. I received my Bachelors of Science and Masters of Science degrees in Microbiology from the University of Texas at El Paso in 1983 and 1985, respectively. In December 1990, I earned my doctorate degree in Molecular Biology from New Mexico State University. From 1991 through early 2003, I worked in DNA research—predominantly cancer research—at the University of Vermont-Department of Molecular Genetics (Burlington, VT), and the Boise V.A. Medical Center (Boise, ID).

2. From May 2003 through May 2007, I trained and worked as a Forensic Biologist with the Indiana State Police (ISP), Evansville Regional Laboratory. For the next eight months, I served as the interim Technical Manager of Forensic Testing Laboratories, a start-up forensic DNA analysis company—located in Las Cruces, New Mexico.

3. In February 2008, I founded Spence Forensic Resources. For the past twelve years, I have been providing my services as a Forensic DNA Consultant—operating out of Las Cruces, New Mexico. I have reviewed over 1050 cases involving the investigation of forensic biology and DNA. These cases have originated from over 90 different forensic DNA laboratories located in thirty U.S. states. I have been qualified and testified as an expert DNA witness in 137 trials/hearings in Indiana, New Mexico, Texas, Arizona, Maryland, Colorado, Michigan, South Carolina, Florida, California, Iowa, Oklahoma, Louisiana, and Arkansas. My Curriculum Vitae has been provided **(Exhibit 1)**.

4. The Daniel Holtzclaw case was first brought to my attention in April, 2016. Appellate counsel representing Officer Holtzclaw expressed an interest in utilizing my expertise in forensic biology/DNA to examine various documents. These documents included, but were not limited to the following: Forensic Examination Reports—released by the Oklahoma City Police Department (OCPD) Crime Laboratory, analyst bench notes, worksheets from evidence examination, DNA extraction and quantification, electropherograms—which are graphical printouts of the DNA data, population statistical calculations, law enforcement investigative reports, and trial testimony transcripts and evidence. After completing my examination of these documents, I was asked by counsel for the defense if I had an opinion as to whether the State's DNA analyst had testified in a manner which was consistent with the forensic biology/DNA data. Also, in recognition of the fact that no DNA expert testified for the defense, I was asked whether or not additional facts could have been presented, for clarifying the position of the defense. My assessments were summarized in an appellate affidavit that was released on January 30, 2017. A copy of this affidavit is provided **(Exhibit 2)**.

5. On March 20, 2020, I received a request to consider being listed as a forensic DNA expert witness for Daniel Holtzclaw—regarding federal civil rights lawsuits that are scheduled to be heard later in 2020. I accepted this request. Upon my agreement to assist Mr. Holtzclaw with the scientific aspects of the pending legal processes, I was provided with additional materials to facilitate preparation of this Summary of Opinions. A portion of the newly accumulated information bears relevance to processes that have occurred after the release of my January, 2017, appellate affidavit. The following is an updated assessment of the case components, and a summary of my anticipated opinions that will be covered during the legal processes scheduled in the coming months.

II. Essential scientific components facilitating the conviction of Officer Holtzclaw

6. The scientific components that facilitated the conviction of Daniel Holtzclaw centered upon results reported from four evidence items: **Item 17Q1**, **Item 17Q2**, **Item 17Q3**, and **Item 17Q4**. These were swabs collected from the outer and inner surfaces of the fly located on the dark blue uniform pants collected from Officer Holtzclaw. A complaining witness, Ms. Adaira Gardner, made a statement to investigators, alleging that she had been digitally and vaginally assaulted by the defendant—at about 9:30 p.m., on June 17, 2014. The duration of the alleged vaginal assault was approximately 10 minutes, through the fly of Officer Holtzclaw's unzipped—but still buckled—uniform pants. The presence of DNA from Ms. Gardner within the results from the above-listed evidence swabs has never been in dispute. Beyond the presence of her DNA, a multitude of perplexing observations were voiced at the trial of Daniel Holtzclaw. The scientific inaccuracy of those courtroom representations was even more troubling.

III. Three instances of scientific perjury—relevant to the trial of Daniel Holtzclaw

7. **Perjury—regarding misguided assertions of "very possible" vaginal secretions**: As part of her sworn testimony, the reporting OCPD analyst, Ms. Elaine Taylor, advised the jury—regarding an alleged rape—as follows: **"A young woman of her age would be very likely to have quite a bit of lubrication"**. Further, Ms. Taylor testified as follows: **"…that lubrication could transfer cells…"** (see Page 4065, lines 18-20). Refer to the March 21, 2019, deposition conducted with the OCPD DNA Laboratory Manager, Mr. Campbell Ruddock. In that deposition, Mr. Ruddock (Ms. Taylor's supervisor) was questioned by the attorney—Ms. Kathleen Zellner, (Page 40-41): **Ms. Zellner: "Do you think that a scientist testifying about the biological capability of a 17-year-old to produce lubrication is within the realm of that scientist's expertise?" Ruddock: "No. No, I don't. As a DNA analyst we're really encapsulated within DNA, our ability to get a profile from DNA." Zellner continued: "...would that be beyond the purview of what a scientist should be testifying about?" Ruddock: "It's definitely not something I would include in the testimony."**

8. Further into Ms. Taylor's trial testimony, her enormously irresponsible statements—regarding vaginal lubrication—were reiterated at the end of Page 4073 (lines 20-24). Counsel for the prosecution asked: **"Does that fact and this evidence also contribute to your opinion about when discussing contact DNA it is much more likely for it to be transferred if the epithelial cells are contained in a liquid such as vaginal fluid?"** Ms. Taylor's response: **"That's a very good possibility."** Doubling down on this solicitation of perjury, the prosecution revisited this key issue during closing arguments (Page 4307, lines 8-13), by referring to the presence of biological material from Ms. Gardner as follows: **"…the most important thing about Adaira Gardner is the fact that DNA from the walls of her vagina was transferred in vaginal fluids onto the outside and inside—not of his pockets, not of his cuff, not where he sits, but of the exact location she says his penis came in contact."**

9. Again, the commentaries outlined above—regarding imaginary vaginal secretions—were presented to the Holtzclaw trial jury, without ***any*** scientific support. After the trial, on February 5, 2016, the prosecutor spoke to a journalist with ***KOKO 5 News***, Oklahoma City—Ms. Erielle Reshef—and asserted the following **(Exhibit 3)**: **"The skin cells were transferred through the body fluids of a 17-year-old girl after he raped her. That's what the evidence was. That's what the jury heard and certainly that's what they convicted him of. They [the defense] tried to explain DNA from a 17-year-old girl that ends up inside his pants at the areas where his privates are. Quite frankly, their explanation was not believable because you can't explain that."** On December 13, 2016, the prosecutor voiced similar statements, this time with Oklahoma City ***News 4*** journalist—Ms. Ali Meyer **(Exhibit 4)**: **"The fluid containing the skin cells is absorbed into the pants. That's what we have. If Mr. Holtzclaw or his supporters are advocating that there is a test that determines that this is vaginal fluid, they are lying. There is no test that does that."** Unfortunately, this prosecutor lacks a rudimentary knowledge of forensic biology/DNA. Consequently, his statements to media sources were profoundly flawed and misleading. Within forensic biology/DNA testing facilities across the U.S., there is indeed a common, presumptive strategy for assessing the presence of vaginal secretions. Crime lab analysts can examine the surfaces of various evidence items, using multiple-wavelength light sources. With very few exceptions, **A**lternate **L**ight **S**ource (ALS) instruments are routinely used to illuminate visible fluorescence on various surfaces. These areas reveal clues toward the presence of stains that might be vaginal secretions, or might be other body fluids. During the investigation of Officer Holtzclaw's dark blue uniform pants, Ms. Taylor inspected the fly area of those pants—using a source of bright light and a magnifying lens (Page 4084, lines 2-4). She observed absolutely ***no*** stains or discolorations. Efforts are underway to gather a number of photographs—at the highest resolution—showing the crumpled up pants, as well as close up photos of the fly area (**all photos are designated as Exhibit 5**). Despite having an expensive ALS instrument at her fingertips (estimated cost=$22,112), Ms. Taylor—inexplicably—chose ***not*** to utilize this resource.

While ALS illumination can provide only a 'presumptive' positive test result, these instruments are extremely unlikely to provide **'false negative'** results—when a vaginal secretion deposit is genuinely present on the target area. Consequently, one is compelled to ask: **"Why didn't the OCPD analyst simply go ahead and check the fly area of the uniform pants—using ALS?"** The troubling answer is as follows: In the event that the results had indicated a **'positive'** fluorescence stain, that may have been dismissed as a false positive—perhaps due to a trace quantity of urine. However, in the event that the examination revealed a complete lack of any fluorescence, that result would have deeply undermined any future plans for courtroom speculation that ***imaginary*** vaginal secretions were present on the uniform pants—supporting the theory of a crime.

10. Refer to the 2010 article authored by Dr. John Butler and Dr. Carolyn R. Hill, bearing the title: **"Scientific Issues with Low Amounts of DNA" (Exhibit 6)**. Within this peer-reviewed article, these authors describe what is universally known in forensic biology/DNA analysis as the **"Stop Testing Approach"**. This approach stems from the concerns of crime lab managers and analysts—that running a specific test might have little value toward revealing incriminating results. On the flip side, a negative result could undermine the successful pursuit of a conviction. Ms. Taylor adeptly avoided any negative ALS result—which would have been unfavorable for the prosecution. Rather than risk the ***only*** useful test that could illuminate the presence/absence of vaginal secretions, the OCPD Crime Lab chose to **Stop Testing**. Ms. Taylor then proceeded to perjure herself with statements that vaginal secretions were most likely present. These statements were made under oath, despite the fact that her initial observation of the pants—under bright light, with a magnifying glass—had failed to reveal any hint of discolorations. In the event that the opposition argues that the lead author of this **'Stop Testing'** publication, Dr. John Butler, is either an unqualified scientist, or a proponent for defense causes, please note that such assertions could not be further from the truth. Dr. Butler is currently a fellow at the National Institute of Standards and Technology (NIST), and is serving as the NIST Vice-Chair on the Commission of Forensic Science. Dr. Butler also serves on the Scientific Working Group on DNA Analysis Methods (SWGDAM). This internationally respected scientist has written several textbooks on forensic DNA typing, covering all aspects of the underlying molecular genetic methods, the application to forensic casework, and bio-statistical interpretation of results. Dr. Butler serves as the Forensic DNA Section Editor for the Encyclopedia of Forensic Sciences (2nd Edition). Among many other awards, in 2003, Dr. Butler received the distinguished Scientific Prize of the International Society for Forensic Genetics.

11. **Principles of DNA Transfer:** Today's remarkably sensitive technology can detect trace DNA/low copy number (LCN) DNA quantities on a multitude of surfaces found within any crime scene. The same holds true, regarding surfaces within any residence, workplace, or vehicle, etc.—where no crime has occurred. Over a century ago, Professor Edmond Locard established the world's first forensic science lab.

Dr. Locard postulated the importance of transfer events, in the context of criminal case investigations. His ideas evolved into the **Locard Exchange Principle**—stating that **"Every contact leaves a trace."** Locard's principle applies more appropriately to modern DNA analysis than its application toward the detection of any other form of trace evidence. Today's state-of-the-art DNA detection technology can produce a full DNA profile from less than ½ of one billionth of a gram of DNA. In order to recover this much DNA, a crime lab analyst needs fewer than 100 cells. A single drop of human blood contains approximately 400,000 DNA-containing cells. A single drop of saliva contains approximately 500,000 salivary epithelial cells. A single drop of semen contains approximately 3 million spermatozoa. Most applicable to the investigation into allegations targeting Officer Holtzclaw, the average human being, from head-to-toe, sheds approximately 2 million skin cells, ***during the course of a single minute***. Revisiting the December 13, 2016, interview with Ms. Ali Meyer **(Exhibit 4)**, the Daniel Holtzclaw trial prosecutor asserted the following: **"If what they are trying to get people to believe, which is not accurate, is that it (DNA) could transfer from a purse, to hands, to pants, to inside of pants, uh, significantly, Daniel Holtzclaw's own DNA was not found on the inside of his uniform pants. I think that speaks probably louder than anything I could argue as to the ability of someone's skin cells from their hands to get transferred to a piece of fabric."** Again, the individual offering these baseless, misguided statements lacks ***any*** rudimentary knowledge that is required for understanding how biological material might be deposited onto evidence—let alone the proper collection and testing of that evidence. The motivation for disingenuously claiming that Daniel Holtzclaw's DNA was not on the fly of his own uniform pants, was to manipulate jurors into believing that ordinary, nonintimate DNA transfer events are exceptionally improbable. This notion is further discredited below.

12. Refer to a recent, comprehensive review of criminal casework and DNA transfer events **(Exhibit 7)**. This peer-reviewed 2019 article cites **298** previous works of research, and is entitled: **"DNA transfer in forensic science: A review"**. Within the abstract of this review, van Oorschot, et al., stated that: **"Understanding the variables impacting DNA transfer, persistence, prevalence and recovery (DNA-TPPR) has become increasingly relevant in investigations of criminal activities to provide opinion on how the DNA of a person of interest became present within the sample collected."** Further, the authors emphasized: **"The discovery that DNA can be detected from non-visible biological material left on a surface merely through touching it by hand, and the extrapolation of this observation to contact with skin in general, drastically broadened the types of items that could be targeted to obtain DNA profiles and the variety of situations in which DNA profiling could be applied. This discovery of the ability to generate profiles from touched objects was initially met with *disbelief* by many within the forensic community, but once verified, became a welcome tool for law enforcement agencies. Within several jurisdictions, samples collected from touched objects now represent more than half the total number of samples processed for DNA profiling."**

Apparently, the Holtzclaw trial prosecutor, acting as a self-appointed authority on DNA transfer, can be counted as one of the sparse few individuals who continue to adhere to their **"disbelief"** in the ability of modern technology to generate forensic DNA profiles from objects that have merely been touched. Refer to the 2016 peer-reviewed article from S. Jones et al., in **Science and Justice**, entitled ***"DNA transfer through nonintimate social contact"***, **(Exhibit 8).** Profoundly applicable to the Holtzclaw case, the authors state that: **"…in those allegations where the complainant and suspect are known to have been in contact with each other prior to the alleged incident, it is important to know whether or not findings support an allegation of sexual intercourse as opposed to nonintimate contact."** The authors also pointed out that: **"…female DNA is detectable on the penis of a male following sexual intercourse after a period of 24 hours has elapsed."** The authors also noted that after two minutes of unprotected sexual intercourse without ejaculation, the DNA obtained from the male's underpants **"…was the result of a secondary transfer of female vaginal material via the penis. This is expected to have comprised a wet transfer of vaginal material (and visible staining was found on the underwear)."** In contrast, the authors reported as follows: **"In this study, no matching female DNA was detected on any of the penile samples taken 6 hours after the staged nonintimate social contact events.** The authors also emphasized the following: **"...no matching female DNA was detected on the inside front of the 44 items of male underwear used in this research following staged contact of a nonintimate nature and subsequent secondary transfer to the penis (during simulated urination). In contrast, DNA matching the female participant was detected in this area of underwear worn following unprotected sexual intercourse."** And **"visible staining was found on the underwear"** after only two minutes of sexual intercourse without ejaculation. Unfortunately, the investigation team assigned to the Holtzclaw case collected ***only*** the uniform pants from the accused officer, and never bothered to collect the most vital items of evidence—his underwear, and a swab sample from his penis. The authors of the Jones et al. article summarized their results—in part—as follows: **"...DNA can occasionally transfer to the waistband and outside front of underwear worn by a male following staged nonintimate social contact." The authors also noted that "DNA corresponding to the DNA profile of the female participant was detected on four of the 30 penile shaft samples."** Again, it is vital to emphasize that Detective Davis and Detective Gregory collected Officer Holtzclaw's pants—precisely 20 hours and 43 minutes after the alleged assault of Ms. Gardner. It is puzzling that these investigators were somehow content with confiscating a fundamentally uninformative pair of pants—rather than targeting the profoundly more useful samples from the man's underwear and genital area.

13. **California v. Lukis Anderson: Scientific Proof of DNA Transfer:** Despite the mountains of forensic research initiatives—establishing that DNA transfer can play a significant role in the landscape of any investigation—the disbelievers of this fact were not fully disproven until the latter part of 2012. On November 29, 2012, a group of

thieves invaded a mansion in Monte Sereno, California, about 10 miles southwest of San Jose. The intruders tied up the owner of the home, and placed duct tape around his mouth/nose area. The perpetrators gathered valuables, and fled the scene. When law enforcement officers and paramedics arrived at the home, they realized that excessive duct tape had caused the homeowner to suffocate. DNA results were recovered from various evidence items. Most notably, a complete DNA profile— found on the fingernails of the murder victim—provided a CODIS database hit, and a perfect match to Mr. Lukis Anderson. In the fall of 2012, Lukis was a homeless, hardcore alcoholic, who spent the majority of his time wandering the streets of downtown San Jose, and hustling for spare change. Lukis and other individuals were charged with the homicide. After Lukis spent the next several weeks in jail, a series of unexpected revelations began changing the landscape of the investigation. Upon reviewing records from the evening of the home invasion/homicide (November 29, 2012), the defense team—working on behalf of Lukis—uncovered the following series of events: **1)** Lukis consumed an enormous quantity of alcohol that evening; **2)** He collapsed within an aisle located in a downtown San Jose market; **3)** Lukis was transported in an ambulance, to the Santa Clara Valley Medical Center; **4)** The near-comatose man spent that entire night detoxing at the medical facility: **5)** Lukis was not discharged until the morning of November 30th—many hours after the home invasion/homicide had taken place—ten miles away—in Monte Sereno. To be clear, the time frame of this detox event spanned long before, and long after the time frame of the home invasion, and the murder. Ultimately, yet another careful review of the medical records revealed that there were two names—two paramedics—who administered aid to the nearly comatose Lukis Anderson, in downtown San Jose. Three hours later, those same two names appeared again—on documents from the initial response at the mansion where the home invasion/homicide had occurred. There is no simple explanation—as to precisely ***how*** the contact with the paramedics, their fingers/gloves, their uniforms, their medical instruments, vectored a 10-mile DNA transfer event from San Jose to Monte Sereno. It is especially baffling, considering the 3-hour time delay between the call to provide aid to Lukis, and the call to the scene of the homicide.

14. During the course of the past five years, I have been writing/updating a book chapter that bears the title: **"Forensic Use of DNA"**. This will be **Chapter 8**, within a 3-volume reference set, entitled: **"The Litigator's Handbook on Forensic Medicine, Psychiatry and Psychology" (Exhibit 9)**. This collection of works is projected to go to press—via Thomson-Reuters-West—during the Fall of 2020. My 55,200-word chapter includes sections discussing DNA transfer events, the Locard Exchange Principle, the 2019 review article from Roland van Oorschot, et al., the Lukis Anderson case, and the illuminating contents of Page 36. This page, back in 2015, and at this very moment, continues to be worded as follows: **"As the frosty weather begins to dominate each winter, litigators should devote some time for a few observations. Take a stroll through your local shopping mall. Visit the homes of some friends, family, or neighbors. Numerous nasal cavities are draining.**

Infected individuals are coughing and sneezing. Crumpled up facial tissues exist in abundance. Although we cannot see them, we know that common cold and influenza viruses are spread from hand-to-surface and hand-to-hand. Trillions of viral particles are spread by infected individuals to door handles, telephones, computer keyboards, car keys, steering wheels, stairway railings, currency, vending machines, TV remote controls, pens, pencils, clothing, and bedding. The list seems endless. If a person is not sufficiently cautious, it only takes a number of days for viruses to replicate themselves in the human respiratory system. In the eyes of the average person, the structure and mobility of DNA differs marginally from the structure and mobility of viruses. Although our genetic molecules are not at all invasive and infective, DNA and viruses are quite similar in that they are both submicroscopic clumps of matter. Transfer events do indeed occur with both of these forms of matter in much the same way. Any person who argues against the prevalence of DNA transfer events in our homes, our workplaces, our vehicles, and within crime scenes, must also doubt that infectious agents are able to spread among human populations. Such an argument is intuitively frivolous." Consider that this section of a book chapter on DNA was written ***before*** mainstream society had ever heard of COVID-19—and long before our world and countless economies have been turned upside down by the 7000-mile spread of this terrible infectious agent—from Wuhan, China, to the rest of the world. We have all heard—during the Holtzclaw trial—the argument that a vaginal secretion transfer of DNA is much more plausible—as opposed to an incidental, nonintimate spread of the invisible molecular material. In light of our current pandemic crisis, how convincing does this vaginal secretion nonsense sound now?

15. **Events during contact with the key complaining witness—Ms. Gardner:** Refer to the May 22, 2019, deposition with Ms. Adaira Gardner (Pages 56-57). The witness responded to a question about the initial traffic stop, executed by Officer Holtzclaw. Ms. Gardner stated that **"…he (Holtzclaw) searched us all and let us go."** The witness was referring to searches of herself, as well as her companions, Ms. Melodie Coleman, and Mr. Nathaniel John Davis. Later, Ms. Gardner stated: **"He searched all three of us, so I don't know how long it would take to search three people and run their names. Probably around 15 minutes, give or take."** Later she added**: "He searched my purse on that occasion."** All of the above comments on the traffic stop were corroborated within a 2019 deposition from Daniel Holtzclaw himself. In addition to the initial pat search, Officer Holtzclaw subsequently searched Ms. Gardner a second time, before allowing her to enter his police cruiser. Refer to a video that has been provided **(Exhibit 10)**, demonstrating the process by which Officer Holtzclaw was trained to conduct routine pat searches. Clearly, these searches require skin-to-skin contact events. It is notable that neither Ms. Coleman, nor Mr. Davis, were ever required to provide a DNA reference sample—for comparison to the unaccounted for genetic profiles discovered on the fly area of Holtzclaw's uniform pants.

16. **Manipulation of Ms. Adaira Gardner's testimony—regarding vaginal secretions:** Much later in her May 22, 2019, deposition (Pages 146-147), Ms. Gardner addressed the moments leading up to her testimony at the trial of Daniel Holtzclaw. Upon being approached by the prosecutor, Ms. Gardner stated as follows: **"Gayland Gieger came to me and he told me I believe you, out of all the other women I believe you. And I said why. And he said, because we were looking for a match of DNA that we found inside his police pants and it was you, we found your vaginal fluid on the inside and outside his police pants."**

17. A key question within the Daniel Holtzclaw investigation and trial was as follows: Was the ***quantity*** of Ms. Gardner's DNA on the fly of the uniform pants suggestive of vaginal secretions—and a sexual assault, or was the DNA yield more suggestive of an ordinary, nonintimate DNA transfer event? Let us review the female DNA quantities recovered from **Item 17Q1**, **Item 17Q2**, **Item 17Q3**, and **Item 17Q4**. First, note that from **Items 17Q1** and **17Q2**, Ms. Taylor measured only the total DNA—with no estimation of the male DNA contribution within those samples. While examination of the electropherogram (egram) from **17Q2** showed male DNA, data from the **17Q1** egram revealed that the male contribution was actually ***greater*** than the female contribution. Ms. Taylor's analysis provided an estimation of 39.9 nanograms (ng) of total DNA from **Item 17Q1**. Ms. Gardner's DNA contribution was less than 20 ng. On one hand, Ms. Taylor disingenuously testified that Daniel Holtzclaw could be excluded from ***all four*** fly areas on the uniform pants. On the other hand, counsel for the defense at the Holtzclaw trial failed to inquire about any precise DNA quantification estimates. Most troubling, counsel for the defense never explored—through cross-examination of Ms. Taylor—any explanation of this predominant male—revealed on **Item 17Q1**. These ineffective counsel errors will be corrected in the coming months. First, the **Item 17Q1** DNA yield will be re-examined. This time, the proper technology will be utilized, for the estimation of ***both*** the total DNA—as well as the ***male*** DNA. This will—for the first time—confirm what we already know—that there is more male DNA present, by comparison to the estimation of DNA from Ms. Gardner. This will also further address the unexplored questions: **"Who is this major male, and how did his DNA end up on the fly of a law enforcement officer's uniform pants?"**

18. The unidentified male DNA recovered from the **Item 17Q1** area of the fly must have resulted from an incidental, nonintimate DNA transfer event, rather than a crime. Male DNA cannot be correlated with vaginal secretions—as males do not produce those. It is faulty to conclude—on one hand—that 20 ng of male DNA is from a routine, nonintimate contact event, whereas a similar quantity of DNA from Ms. Gardner somehow constitutes ***proof of a sexual assault***. Refer to the Excel spreadsheet that has been provided **(Exhibit 11)**. Note that this table lists the ng amounts of female DNA recovered from forty-three case items, from over 20 different actual cases that I have reviewed over the past 3-4 years. Some samples are marked on the table as **"vaginal swabs"**, which would certainly contain vaginal secretions.

Other listed samples may have been designated as swabs from intimate female regions such as external genital, mons pubis, labia majora, or labia minora. All of these samples have been categorized as **"labial swabs"**. When Sexual Assault Nurse Examiners (SANE) nurses collect intimate swabs from females, the intention is to maximize recovery of any male DNA. The SANE nurse—logically—must use care to minimize the recovery of female-derived vaginal secretions or surface skin cells. Some samples listed on the spreadsheet were collected as cuttings/swabs from the inner crotch areas of female undergarments. While vaginal secretions are known to routinely accumulate on genital areas of intimate clothing items, it is not uncommon to observe that the garments appear to be freshly laundered. A clean item may have been worn for only a short time frame. As case items vary, female DNA quantities vary, and the presence of vaginal secretions, on labial and clothing samples can vary dramatically. An assessment of the female DNA quantities recovered from all 43 evidence samples reveals a median value of **728 ng**. The same collection of results reveals a mean value of **1581 ng**. Those dedicated to the defense of Officer Daniel Holtzclaw wish to encourage the OCPD Crime Laboratory to conduct similar, random surveys of female DNA yield results. Such surveys should be from a comprehensive list of forensic DNA extraction yields comprised of female intimate area swabs, and garments coming into contact with the external genital area. Ideally, a survey should be a ***blind study*** of female DNA yield results, originating from numerous cases, and numerous labs. Due to the remarkably DNA-rich nature of vaginal secretions, parallel **median** and **mean** values will be reproduced from such studies.

19. Note that, during the Holtzclaw investigation, a swab sample was collected from the passenger side, rear, interior door handle from Officer Holtzclaw's police cruiser. This was **Item 6A**—which provided Ms. Elaine Taylor with a total DNA yield of **43 ng**. Keep in mind that this amount of DNA originated from a surface that—logically—is expected to contain 'handling DNA'—and ***no*** body fluids. Also consider that the female DNA on the four areas of the fly area of the uniform pants, ranged from ***10 ng to 23 ng***. These amounts, taken together with the median/mean results on **Exhibit 11**, confirms that it is perjury—to assert that vaginal secretions are **"very possible"**.

IV. 2nd of 3 instances of scientific perjury—relevant to the trial of Daniel Holtzclaw

20. **Perjury—asserting the absence of male DNA on *any one* of the fly areas:** Once the total DNA/male DNA quantifications have been conducted on **Item 17Q1**, as described in **Section 17**, the defense will subject the DNA samples to male-based YSTR genetic typing. This initiative will affirm that an unidentified male is the major contributor in the **Item 17Q1** DNA mixture—by comparison to Ms. Adaira Gardner's DNA. The analysis will also establish the presence of male DNA from **Item 17Q3** and **Item 17Q4**. This will open the door for DNA comparisons with Mr. Nathaniel John Davis, as well as with Detective Rocky Gregory. Additionally, YSTR typing can confirm any instances where more than one source of male DNA is present.

Unfortunately, YSTR typing results—by themselves—are not able to reconstruct the precise mechanism by which numerous nanograms of DNA from unidentified males have been incidentally transferred onto any of the fly areas of Officer Holtzclaw's uniform pants.

21. Similar to **Item 17Q1**, **Item 17Q2** was assessed for DNA yield, using a system that estimated only the ***total*** quantity of DNA (no male DNA estimate). It may not be necessary for the defense to re-quantify the DNA from **Item 17Q2**. Ms. Taylor's total DNA estimate was **23.2 ng**. Clearly, male DNA was present—as the egram revealed an unmistakable Y-chromosome signal at the Amelogenin locus. However, the majority of the sample originated from female DNA contributions (including Ms. Gardner). Keeping this in mind, it was profoundly irresponsible to testify that Daniel Holtzclaw is **"excluded"** as a contributor to **Item 17Q2**. This testimony from the OCPD analyst contradicted her official report—released on November 12, 2014, that the minor results from **Item 17Q2** were inconclusive. Interestingly, Ms. Taylor's testimony excluding Officer Holtzclaw as a contributor within all four areas of the fly on his uniform pants actually contradicted an earlier portion of her trial testimony—when the prosecution asked her to elaborate on the **Item 17Q2** Y-chromosome signal at the Amelogenin locus (Page 4056, lines 19-21). Ms. Taylor: **"…the statement that best suits that minor contributor [at 17Q2] is that it is not suitable for comparison purposes."** During her more recent deposition, Ms. Taylor further admitted to these contradictions, acknowledging the following: **"If there's insufficient genetic data, you do not exclude them because there's not enough data."**

22. Regarding **Item 17Q3** and **Item 17Q4**, Ms. Taylor's perjury continued, as she testified that male DNA was absent from both of these areas of the fly on the uniform pants. The trial transcript (at Page 4072, lines 19-25) shows that Ms. Taylor was asked by the prosecution: **"Did you find evidence of male DNA at either one of those locations…?"** Ms. Taylor: **"There's no Y so the answer is no."** The prosecution: **"There's none there. So even though Officer Holtzclaw was wearing these pants, his DNA is not inside them; correct?"** Ms. Taylor: **"That is correct."** This testimony was fraudulent and prejudicial. Refer to the collection of case file materials designated as **Exhibit 12**. First, refer to **Page 2** of the **Item 17Q3** egram, date/time stamped as: **"Fri Oct 02, 2015, 12:09PM, CDT"**. Then, refer to **Page 2** of the **Item 17Q4** egram, date/time stamped as: **"Fri Oct 02, 2015, 12:10PM, CDT"**. While both sets of these DNA typing results show extremely high X chromosome peaks at the Amelogenin locus, note the enormously expansive scale for each egram—shown at the far left extreme of the Amelogenin data panel. Within both egrams, the scale for the Amelogenin locus ranges from 0 to about 6000 or 7000 Relative Fluorescence Units (RFUs). In the event that a low level peak at the Amelogenin Y position was discernable, this broad scale would make it quite challenging to visualize such a signal on the graph.

23. Within **Exhibit 12**, refer to the data sheet entitled: **"qPCR Report For SD14-273"**. This document reveals the fact that ***0.0102 nanograms/microliter male DNA*** was indeed recovered from **Item 17Q3**. Within this same data sheet, there is no doubt that ***0.0117 nanograms/microliter male DNA*** was indeed recovered from **Item 17Q4**. Once again, Ms. Taylor committed perjury in the presence of Officer Holtzclaw's jury, by creating a smokescreen that concealed the actual finding of ***male DNA***, and testifying in contradiction to this unequivocal fact.

V. 3rd of 3 instances of scientific perjury—relevant to the trial of Daniel Holtzclaw

24. **Perjury—testimony that Holtzclaw's DNA is absent from all areas of the fly:** One might intuitively question why it will be illuminating to establish that DNA from Daniel Holtzclaw is most likely present on the **Item 17Q4** area of his own uniform pants. First, it is clear that the prosecution collaborated with Ms. Taylor to provide the Holtzclaw trial jury with the misguided assertion that the incidental transfer of Daniel's DNA to the fly on his own pants simply did not happen. Next, the jury was subjected to a twisted, counterintuitive proclamation that—since one incidental DNA transfer event did not happen with Daniel—it would be preposterous for anyone to assume that Ms. Gardner's DNA may have been deposited through a similar, nonintimate event. By invalidating any instances of incidental DNA transfer—in the eyes of the prosecution—jurors could assume that Ms. Gardner's DNA must have been transferred through vaginal secretions, as a consequence of a sexual assault. Recall that—in an interview on December 13, 2016, the prosecutor opined: **"…Daniel Holtzclaw's own DNA was not found on the inside of his uniform pants. I think that speaks probably louder than anything I could argue as to the ability of someone's skin cells from their hands to get transferred to a piece of fabric."** As emphasized in **Section 22**, Ms. Taylor testified for the prosecution, regarding the fictional assertion that Daniel Holtzclaw is excluded as a contributor to all areas of the fly on his own uniform pants. While such an assertion is faulty, note that—within **Exhibit 12**—the **Item 17Q4** DNA mixture reported by Ms. Taylor showed a male contribution, and ten alleles could not have originated from Ms. Adaira Gardner. Considering that ***nine*** of these ten allelic signals were consistent with the DNA from Daniel Holtzclaw, the defense will arrange for further analysis of the raw STR data generated from the analysis of **Item 17Q4**.

25. During the latter part of 2015, the DNA mixture analysis conducted by Ms. Taylor and the OCPD Crime Laboratory, centering on **Items 17Q1, 17Q2, 17Q3,** and **17Q4**, seemed reasonably appropriate for that time frame. However, the strategies utilized—throughout the U.S.—for deconvolution of DNA mixtures has rapidly been implicated as defective and obsolete. For verification of this fact, refer to published information on the MIX05 and MIX13 studies conducted by the National Institute of Standards and Technology (NIST). These studies were spearheaded by Dr. John Butler. Specifically, refer to the 2018 peer-reviewed publication: John M. Butler, Margaret C. Kline, and Michael D. Coble, entitled: ***"NIST Interlaboratory studies involving DNA mixtures (MIX05 and MIX13): Variation observed and lessons learned"***,

Forensic Science International: Genetics, *81-94* (**Exhibit 13**). During the very month that Officer Daniel Holtzclaw was subjected to his trial—and convicted—the Federal Bureau of Investigation (FBI) Crime Laboratory actually abandoned what is referred to as their **'binary threshold'** strategy for evaluating DNA mixtures. This is the very same 2015 methodology that was used by the OCPD, to assess the DNA mixtures discovered on the fly of the uniform pants. Most important, this obsolete method was used to improperly interpret the DNA mixture found on **Item 17Q4**.

26. In order to replace the dreadful inadequacies and misinterpretations, stemming from the faulty **'binary'** method of DNA mixture analysis, the FBI, NIST, and SWGDAM have embraced improved technology, referred to as probabilistic genotyping (PG) software. The objective of PG DNA mixture analysis is to begin with the diverse assortment of allelic signals, emerging from the DNA typing process. What follows is a computer-driven process of separating out the likely individual genetic types within those mixtures. One of the developers of a leading PG analysis software (**TrueAllele®**) is Cybergenetics—based out of Pittsburgh, PA. Dr. Mark W. Perlin is the Chief Scientific and Executive Officer at this company.

27. In December, 2015, the FBI Crime Lab abandoned the binary methodology. Our nation's crime lab now utilizes **STRmix™**, a PG analytical software—that was developed in competition with **TrueAllele®**. **STRmix™** was developed at the New Zealand Institute of Environmental Science and Research (ESR). Creation of this PG software is credited to Dr. John Buckleton and Dr. Jo-Anne Bright, forensic scientists who collaborated with Duncan Taylor, from Forensic Science South Australia (FSSA). The **STRmix™** website assures us as follows: **"STRmix™ is expert forensic software that can resolve previously unresolvable mixed DNA profiles. Developed by global leaders in the field, it uses a fully continuous approach for DNA profile interpretation, resolving complex DNA mixtures worldwide."**

28. Exploration of the website: **https://www.strmix.com/** shows us that **STRmix™** can be used to resolve relatively simple DNA mixtures, as well as complex mixtures, prior to factoring in the data from any known reference samples. Using well-established statistical methods, the software builds millions of conceptual DNA profiles. It grades these profiles against the evidence sample, finding the combinations that logically justify the observations. Only after this has been accomplished, a range of Likelihood Ratio (LR) options are used for subsequent comparisons to known reference profiles. Specifically, **STRmix™** uses a Markov Chain Monte Carlo (MCMC) engine to model peak heights of potential allelic data. The software also models various types of apparent stutter peak data, and factors in the possibility of allelic drop out events. All of these functions are performed rapidly by **STRmix™**. The MCMC statistical approach provides a mechanism of sampling from any complicated distribution of data. Complicated distributions—such as the myriad of peak heights generated within a DNA mixture e-gram landscape—can be enormously challenging for probability calculations.

Due to the fact that the performance of **STRmix™** is being supported by comprehensive validation studies—with these underlying mathematics readily accessible to forensic DNA experts—the effectiveness of the software can be adequately summarized for jurors. In recent years, PG analysis systems like **STRmix™** and **TrueAllele®** have become universally accepted in the U.S. criminal justice system, and worldwide. Use of this technology to further scrutinize the raw data from **Item 17Q4—**and perhaps other samples from the fly of the uniform pants—will transcend the substandard analysis performed by the OCPD Crime Lab in 2015.

29. The defense team will utilize ***both*** **TrueAllele®** and **STRmix™** for deconvolution of the **Item 17Q4** DNA mixture. Once that has been accomplished, the reporting scientists will factor in the assumption that a portion of the DNA has been contributed by Ms. Adaira Gardner. Each PG software system will then assign a likelihood ratio (LR) calculation that will illuminate a comparison between the prosecution's hypothesis—that the **Item 17Q4** results are a consequence of a random, unidentified individual, versus the Holtzclaw defense hypothesis—that the officer's DNA is obviously present on the fly of his own uniform pants. The weight of these LR calculations will illuminate the degree to which Ms. Elaine Taylor misinterpreted the DNA mixture results from **Item 17Q4**—using the shoddy 2015 methodology. The LR calculations will also expose the degree to which Ms. Taylor and the prosecution collaborated on intentionally misinforming the jurors who were sitting in judgement of Officer Daniel Holtzclaw, during his December 2015 trial.

30. **In Summary:** During the investigation of Officer Daniel Holtzclaw, during his trial, and during the lengthy aftermath of his trial (over 4½ years), many statements have been publicized, regarding the issue that is central to all of the pertinent proceedings. That issue is the perceived plausibility of DNA transfer onto fabric, as a consequence of a sexual assault, versus the perceived plausibility of ordinary, nonintimate transfers of DNA. A portion of the assertions—embracing the former, and disregarding the latter—have been voiced by the prosecution responsible for the December, 2015 trial process. Detectives and supervisors associated with the case have voiced their belief that DNA results from the OCPD Crime Lab confirmed that sexual contact had indeed occurred. Similarly, these individuals have stated their conclusion that it is not possible for casual, nonintimate contact to cause such a transfer event. One detective stated unequivocally, **"I have not worked one sexual assault case, and had transfer DNA."** Another detective opined as follows: **"Transfer DNA is just almost but impossible right now, with what we have."** Most profound, the Oklahoma Court of Criminal Appeals (OCCA) issued an opinion that included the following: **"Taylor testified that, because Appellant was not a contributor to the DNA sample, there was a good possibility that the cells had been in a liquid such as vaginal fluid and transferred to the Appellant's pants."** (Opinion at 36).

During the trial of Officer Daniel Holtzclaw, defense counsel did not question the fact that the sworn testimony from Ms. Taylor contradicted her own case records. The OCPD analyst testified that no male DNA was found on either **Item 17Q3** or **Item 17Q4**. Her records revealed otherwise. The OCPD analyst testified that Officer Holtzclaw was excluded, and could not have contributed DNA to any of the surfaces on the fly of his own uniform pants. This contradicted her ***"inconclusive"*** assessment—regarding **Item 17Q2**—documented in her November 12, 2014 report. These vital contradictions served as a precursor for an illogical and disingenuous assessment of the DNA mixture results—during the prosecution's closing arguments. The closing argument emphasized doubts that Officer Holtzclaw could have inadvertently facilitated a nonintimate secondary transfer of Ms. Gardner's DNA onto the fly of his uniform pants. The rationale for these doubts was the ***imaginary*** absence of male DNA on the fly surfaces, in addition to the reversal from ***inconclusive***, to the inaccurate courtroom assertion that Officer Holtzclaw must suddenly be ***excluded***. The OCPD analyst and the prosecution collaborated in emphasizing that the source of Ms. Gardner's DNA was most likely from the transfer of vaginal secretions during an alleged penile/vaginal sexual assault. These summarized instances of speculation not only contradicted the scientific results, they defied the logic that wearers typically leave DNA on their own frequently used garments. Defense counsel failed to cross-examine Ms. Taylor—regarding the remarkably modest quantities of DNA recovered from **Items 17Q1, 17Q2, 17Q3,** and **17Q4**. This was despite the fact that Ms. Taylor testified to the jury, as follows: **"I quantitate it after it's extracted so I don't overload our system. And I can tell you a quantity."** In the event that a qualified DNA expert had been assertively utilized to assist with the scientific defense of Officer Holtzclaw, the jury would have heard a balance of viewpoints. For example, the jury would have understood that—based upon the scientific literature—the quantities of DNA observed within the samples from the fly of the pants were quite consistent with the expected transfer of epithelial cells during incidental, nonintimate handling events.

It is profoundly irresponsible for any scientist to testify that the transfer of vaginal secretions from an alleged victim, to the fly on a pair of pants, is somehow more probable than other mechanisms of DNA transfer. This is especially true when that same scientist offers this speculation—without the benefit of any scientific hint that such secretions might actually be present, and no DNA quantitative data are available to support such deceptive forms of speculation.

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