REPORT ON SCIENTIFIC ISSUES IN THE CASE OF OKLAHOMA V. DANIEL K. HOLTZCLAW BY AN INTERNATIONAL PANEL OF FORENSIC EXPERTS

FORENSIC EXPERT PANEL

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Based on the *Amicus Curiae* Brief
for Case No. F-2016-62
in the Oklahoma Court of Criminal Appeals

DANIEL K. HOLTZCLAW, *Appellant,*

v.

THE STATE OF OKLAHOMA, *Appellee.*

Dated: July 25th, 2017

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INTEREST OF THE FORENSIC EXPERT PANEL

The international panel of forensic experts is composed of six forensic scientists and academics whose fields of study include forensic science, criminology, and psychology. They are experienced with proper use of the scientific method and the analysis of forensic DNA and serology evidence. They include members of the American Academy of Forensic Sciences who have provided expert forensic science testimony in court and have authored articles and texts about forensic evidence.

Because of their work as scientists and their interest in the criminal justice system, the panel members are concerned about the improper use of forensic evidence that causes a miscarriage of justice. As the President's Council of Advisors on Science and Technology stated, "[I]t has become increasingly clear in recent years that lack of rigor in the assessment of the scientific validity of forensic evidence is not just a hypothetical problem but a real and significant weakness in the judicial system." President's Council of Advisors on Science and Technology, Executive Office of the President, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* 22 (2016) (hereafter "PCAST Report"). Thus, "it is the proper province of the scientific community to provide guidance concerning scientific standards for scientific validity." *Id.* at 21. To that end, the panel offers this report.

In the view of the panel, DNA evidence was misused at Mr. Holtzclaw's trial at which he was convicted. Miscarriages of justice based on misleading DNA evidence are fundamentally unfair and harmful to the entire judicial system. Panel members with this report offer their views on the ways in which that misuse occurred, such that the miscarriage of justice can be corrected.

Peter Gill has a Ph.D. in Genetics and Zoology from the University of Liverpool, UK, and worked at the Forensic Science Service between 1982-2008, reaching the grade of Principle Research Scientist. He began research into DNA in 1985, collaborating with Sir Alec Jeffreys of Leicester University. In the same year he co-authored the first demonstration of the forensic application of DNA profiling. Other contributions include: analysis of the remains of the Romanov family; early development of STR multiplexes and national DNA databases; development of "low-template" DNA analysis; development of theory and practice of complex mixtures using probabilistic methods. He is currently Professor of Forensic Genetics at the University of Oslo Hospital. He is a member of the EU-funded "Euroforgen Network of Excellence," the European Network of Forensic Science Institutes (co-chair of the methods, analysis and interpretation sub-group), the European DNA profiling Group, and the International Society of Forensic Genetics (ISFG) – chair of the ISFG DNA commission. He was awarded the ISFG scientific prize in 2013 for outstanding contributions to the field. He has published more than 200 peer-reviewed papers and one book entitled MISLEADING DNA EVIDENCE: REASONS FOR MISCARRIAGES OF JUSTICE. Current research interests include complex mixture analysis; analysis of miscarriages of justice; investigations of the limitations of DNA profiling evidence; the effect of secondary transfer and shedder status on findings.

Jane Goodman-Delahunty holds a Ph.D. in Psychology and Law from the University of Washington, a J.D. cum laude from the University of Seattle School of Law, a Transvaal Teachers Higher Diploma with highest distinction from Witwatersrand University, and a B.A. from Witwatersrand University. Since 1983 she has conducted original research on jury bias, jury reasoning and decision making in complex cases involving forensic scientific evidence. Her

research on this topic has attracted international funding from peak agencies such as the US National Institute of Justice, the Australian Institute of Criminology and the Korean Institute of Criminology. Since 2001 she has been a full-time academic, based in Sydney, Australia. From 2001-2005 she directed the Forensic Psychology Postgraduate Program at the University of New South Wales. Since 2009 she has been a Research Professor at Charles Sturt University and a Visiting Professor in the United Kingdom, Japan, and China. She is the author of over 200 peer-reviewed books and scholarly articles on topics related to jury misperceptions of expert scientific evidence and the weight accorded to DNA evidence in cases with circumstantial evidence, jury biases and reasoning, and miscarriages of justice. She has trained lawyers and judges in several countries on the strengths and weaknesses of DNA evidence, and developed tutorials that experts and lawyers can use to assist juries.

Suzanna Ryan holds an M.S. in Forensic Science from Virginia Commonwealth University and a B.S. in Biology with a minor in Chemistry from Lock Haven University of Pennsylvania. Ms. Ryan is an Independent Forensic DNA Consultant at Ryan Forensic DNA Consulting providing forensic DNA and serology consultation services and Expert Witness testimony, and a Forensic Serologist at Advanced Serology Laboratory where she performs biological evidence screening for the presence of blood, semen, saliva, vaginal fluid, and menstrual fluid. Ms. Ryan has worked as a DNA analyst for both public and private DNA labs, including the Florida Department of Law Enforcement Crime Lab, the Charlotte-Mecklenburg Police Department Crime Lab, The Bode Technology Group, and Crime Scene Technologies. Ms. Ryan's deposition and trial testimony experiences include testimony for both the prosecution and the defense. She has been accepted as an expert witness in forensic serology and DNA

analysis over 100 times in her career and has been deposed as an expert witness over 20 times. In addition to her considerable forensic case-working experience, which includes processing several thousand cases, Ms. Ryan has also served as an adjunct professor for National University's Master of Forensic Science program where she taught the Advanced Forensic Serology and DNA course as well as the Advanced Criminalistics course. She has published peer-reviewed journal articles in the JOURNAL OF FORENSIC SCIENCES and the JOURNAL OF COLD CASE REVIEW. Ms. Ryan is a member of the American Academy of Forensic Sciences, the California Association of Criminalists, and she has been certified as a Diplomate in Forensic Biology by the American Board of Criminalistics.

Moses S. Schanfield earned his Ph.D. in Human Genetics and his M.A. and B.A. in Anthropology. He is a professor in the Departments of Forensic Sciences and Anthropology at George Washington University, where he consults on forensic DNA cases and researches applied genetics, forensic genetics, paternity testing, anthropological genetics, and human evolution and adaptation. Dr. Schanfield has directed licensed private- and public-sector clinical laboratories and forensic laboratories that worked with genetic marker testing and forensic evidence in civil and criminal cases. He was director of Monroe County Public Safety Laboratory in Rochester, NY, a full-service regional crime laboratory serving a population of approximately 1.25 million. Dr. Schanfield was involved with many of the early forensic DNA cases, and was the director of Analytical Genetic Testing Center, Inc., in Denver, Co., a private forensic laboratory that did early development on PCR based testing and discovered the in-lane size ladder, the backbone of modern forensic DNA typing. Dr. Schanfield has testified more than 115 times in the courts of 39 states, as well as in federal, military, and foreign courts, on parentage testing, population

genetics, forensic testing, and related subjects, for both the prosecution and the defense. He has authored and edited three books, more than 95 peer-reviewed articles, and 45 book and encyclopedia chapters or non-peer reviewed articles on forensic sciences, including forensic DNA testing. He is an editor of the journal HUMAN BIOLOGY, a founding member of the American Association of Anthropological Genetics, and a Fellow of the American Academy of Forensic Sciences. Among Dr. Schanfield's many accomplishments in the fields of genetics and forensics are his co-discoveries that HIV originated in Africa, and that an in-lane size DNA ladder, the current standard for all DNA sequencing and testing, can be used to correct DNA migration shifting.

George Schiro received his M.S. in Industrial Chemistry - Forensic Science from the University of Central Florida and his B.S. degree in Microbiology from Louisiana State University, and he holds a Certificate of Professional Competency in Criminalistics. Mr. Schiro is the Laboratory Director of Scales Biological Laboratory (SBL), an ANAB accredited, private DNA testing facility in Brandon, Mississippi, where he also works as DNA technical leader and a forensic DNA analyst, consulting in the areas of serological analysis, crime scene investigation/reconstruction, projectile trajectory reconstructions, and bloodstain pattern analysis, among others. Mr. Schiro was previously employed as a Criminalist with the Jefferson Parish Sheriff's Office Crime Lab in Metairie, Louisiana, where he conducted forensic analyses including serological analysis, and crime scene investigations; a Forensic Scientist with the ASCLD-LAB accredited Louisiana State Police Crime Lab in Baton Rouge, working in the areas of serology and DNA analysis; and as a Forensic Chemist - DNA Technical Leader by the FQS accredited Acadiana Criminalistics Laboratory (ACL) in New Iberia, Louisiana. During his

career, Mr. Schiro has worked over 3,900 cases and has testified as an expert for the prosecution or defense in over 195 trials in 31 Louisiana parishes, eight Mississippi counties, two Florida counties, two New York counties, two Texas counties, eight other states, three federal courts, one U.S. court martial, and two Louisiana city courts. He has consulted on cases in 30 states, for the United States Army and Air Force, and in New Zealand, Panama, and the United Kingdom. He is past chairperson and currently a fellow of the Association of Forensic DNA Analysts and Administrators (AFDAA). In addition, he is past president and vice president of the Louisiana Association of Forensic Scientists (LAFS) and was the editor of NANOGRAM, the official publication of LAFS. Mr. Schiro has also authored several papers, some of which have appeared in both electronic and print media, and he is a contributing author to the FORENSIC MEDICINE SOURCEBOOK. He has spoken to numerous criminal justice organizations on various aspects of forensic science and crime scene investigation, including at the Fourth and Seventh International Conferences on Legal Medicine held in Panama City, Panama, and as guest lecturer at the U.S. State Department's Anti-Terrorism Assistance Program Police Executive Seminar. Mr. Schiro is a fellow of the American Academy of Forensic Sciences and a Fellow of the American Board of Criminalistics (Specialty Area: Molecular Biology).

Brent Turvey holds a Ph.D. in Criminology from Bond University, an M.S. in Forensic Science from University of New Haven, and a B.S. in Psychology as well as a B.S. in History from Portland State University. Since 1996, Dr. Turvey has performed casework as a Forensic Scientist, Crime Reconstructionist, and/or Criminal Profiler for law enforcement agencies and attorney clients all over the world. This includes consults and expert forensic testimony in both criminal and civil matters. His caseload involves sexual assaults, false allegations, serial rapes

and homicides, mass homicides, sexual homicides, domestic homicides, staged crime scenes, and homicides of a particularly violent or aberrant nature. It also includes a femicide caseload in Latin America, and the implementation of the "United Nations Model Protocol for Femicide Investigation in Latin America," with The Forensic Criminology Institute. He has worked for government agencies and universities in the United States, China, Korea, Singapore, Colombia, Mexico, Spain, Guatemala, Portugal, Australia, and Scotland. He is also the author of multiple peer-reviewed textbooks on subjects relating to criminal profiling, forensic criminology, forensic victimology, forensic science, criminal investigation, criminal justice ethics, miscarriages of justice, and law enforcement corruption.

INTRODUCTION

"Because of the belief in DNA evidence as infallible, errors, mishandling, misuse, and manipulation of DNA evidence is absolutely intolerable." Kimberly Cogdell Boies, *Misuse of DNA Evidence Is Not Always a "Harmless Error": DNA Evidence, Prosecutorial Misconduct, and Wrongful Conviction*, 17 TEX. WESLEYAN L. REV. 403, 438 (2011). "Misuse of DNA evidence should rarely receive harmless error review because of the substantial impact that DNA evidence may have on the outcome of the case." *Id.* at 405.

Courts have recognized the unique harm caused by forensic science errors and misrepresentation of DNA evidence. When forensic evidence is presented at trial, courts must be extra vigilant because juries may give it "far more credence than it may deserve" and convict based on unreasonable inferences that deny justice. *United States v. Hebshie*, 754 F. Supp. 2d 89, 94 (D. Mass. 2010) (overturning a conviction because experts gave flawed scientific testimony), *citing Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596-597 (1993) (citations omitted). Misrepresentation of DNA evidence is especially pernicious because of the "immensely persuasive effect DNA evidence tends to have" and its inherent "aura of conclusiveness." *Duncan v. Commonwealth*, 322 S.W.3d 81, 91-93, 97 (Ky. 2010) (reversing a conviction because the prosecution's misuse of DNA evidence rendered the trial "manifestly unfair"). DNA evidence "is subject to vast misunderstanding and misuse. Although at times highly probative, it can also […] be much more modestly probative or hardly probative at all." *Id.* at 93.

The misuse of DNA evidence in Mr. Holtzclaw's trial – and the failure of defense counsel to challenge it – went to the heart of the case and deprived Mr. Holtzclaw of a fair trial. We are

concerned that forensic science mistakes were made during collection, analysis, and testimony about the DNA evidence from the fly of Mr. Holtzclaw's uniform pants, with prosecutorial misconduct violating Mr. Holtzclaw's rights to due process. Trial defense counsel did not effectively reveal or address these errors, in violation of the Sixth Amendment requirement for effective counsel, causing the DNA evidence to be extremely prejudicial even though it had little probative value because it could be explained by non-intimate DNA indirect transfer.

The misrepresentations of the DNA evidence in Mr. Holtzclaw's trial were harmful in light of all the other circumstantial evidence not just because jurors ascribe great weight to DNA evidence, even when it lacks probative value, but also because the State obtained much of the circumstantial evidence in the case by building a biased investigation upon the foundation of the misrepresented DNA evidence. *See* Saul M. Kassin, Itiel E. Dror & Jeff Kukucka, *The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions*, 2 J. OF APPLIED RESEARCH IN MEMORY AND COGNITION 42, 50 (2013).

Mr. Holtzclaw's conviction has broad implications for the forensic science and legal communities due to increasing awareness that justice can be compromised by investigator error and bias during DNA analysis because DNA profiles "can be misinterpreted, and their importance exaggerated," making the evidence appear incriminating when it can be the innocent result of non-intimate DNA indirect transfer, DNA transfer unrelated to an alleged crime, or contamination. SENSE ABOUT SCIENCE, MAKING SENSE OF FORENSIC GENETICS 6, 18 (2017).

The panel of forensic experts created this report to explain the severity of the forensic science errors and the reasons they were highly prejudicial, impacting the verdict and leading to convictions on 18 out of 36 counts that were unlikely to have been secured if the DNA evidence

had been analyzed and presented correctly. This report amplifies the arguments in Proposition VII in Mr. Holtzclaw's February 1, 2017, brief, at pp. 49-50: "The accumulation of error in this case deprived appellant of due process of law in violation of the Fifth and Fourteenth Amendments to the United States Constitution and Article II § 7 of the Oklahoma Constitution."

STATEMENT OF THE FACTS

Mr. Holtzclaw was an Oklahoma City Police Department (OCPD) police officer. On June 17, 2014, around 7 p.m., Mr. Holtzclaw stopped a 17-year-old, Complainant 1 (C1), along with two of her friends, a woman and a man, who were having an argument by the road. (Trial Transcript (Tr.) pp. 3749-51, 3801-03, 3900) Mr. Holtzclaw questioned each individual, placing the male in the back seat of the patrol car. (Tr. 3802) Mr. Holtzclaw ran their names for warrants and found that Ms. C1 had a warrant for trespassing. (Tr. 3752, 3899) Ms. C1 said he searched her purse for drugs (Tr. 3802, 3808) before releasing all three individuals (Tr. 3754).

Around 9:30 p.m. on that same evening of June 17, 2014, Mr. Holtzclaw then saw the teenager, Ms. C1, walking by herself and gave her a ride to her mother's house. (Tr. 3806-08) While on the mudroom porch, Mr. Holtzclaw was alleged to have pat-searched Ms. C1 by placing his hands on her skin under her shirt and bra, before allegedly inserting his finger into her vagina and then raping her vaginally for "about ten minutes" through the unzipped fly of his buckled uniform pants. (Tr. 3768-73)

Afterwards, around 11:45 p.m., Mr. Holtzclaw then allegedly raped a second woman, Ms. C10, for 20 to 30 minutes and orally sodomized her through the unzipped fly of his buckled pants. (Tr. 3627) Ms. C10's allegations led to an acquittal. Finally, after the end of his shift at 2 a.m. on June 18, 2014, Mr. Holtzclaw stopped a vehicle driven by a third woman, Ms. C2, who

was allegedly orally sodomized by Mr. Holtzclaw through the unzipped fly of his buckled uniform pants. (Tr. 501, 511)

A few hours later on the morning of June 18, 2014, Ms. C2 reported to police that an officer had forcibly orally sodomized her after stopping her vehicle. A Sexual Assault Nurse Exam (SANE) of Ms. C2 occurred within several hours of the alleged sexual assault. (Tr. 4038)

On the afternoon of June 18, 2014, two OCPD sex crimes detectives, one female and the other male, interrogated Mr. Holtzclaw for approximately two hours, handing him pens to fill out forms. (State's Exhibit #14) At the end of the interrogation, the male detective inserted his bare hand in an evidence bag into which Mr. Holtzclaw then placed both his dark navy blue uniform pants (Item #17) and black Velcro belt in the keepers (Item #18). (Original Record (O.R.) p. 177) Only Mr. Holtzclaw's uniform pants and Velcro belt were collected as evidence. *Id.*

Ms. C2's SANE kit, as testified by the OCPD forensic analyst, "unfortunately in this case" came back negative without any evidence of Mr. Holtzclaw's DNA in or around Ms. C2's mouth. (Tr. 4038) No fingerprints or DNA supported Ms. C2's account that she and Mr. Holtzclaw placed their hands on top of his patrol car. (Tr. 482, 508, 1095-96)

The OCPD forensic analyst observed nothing suspicious on the fly of the uniform pants by using a very bright light and a magnifying glass. (Tr. 4084) She did not test the uniform pants for body fluids or use an Alternate Light Source to identify whether latent stains were present. (Tr. 4078-79, 4084) Instead, she proceeded directly to swabbing only the outside and inside of the fly of Mr. Holtzclaw's uniform pants for DNA. (Tr. 4028-30, 4084)

The forensic analyst obtained four DNA samples, items #17Q1 and #17Q2 (in June of 2014), and then items #17Q3 and #17Q4 more than a year later (in September of 2015), by

"vigorously" rubbing wet cotton swabs up and down the full length of the fly of the uniform pants on four different stretches of fabric alongside the zipper: the outer, left-hand surface of the fly (#17Q1); an inner, right-hand fabric flap that is revealed when the zipper is unzipped (#17Q2); and two interior stretches of fabric to the left and right of the zipper (#17Q3 and #17Q4, respectively). (Tr. 4032-33, 4040, 4062); Bench Notes of OCPD forensic analyst.

The purified DNA is assumed to derive from epithelial cells, which form the skin layer on the outside of the body including inside orifices such as mouth and vagina, because the DNA purification method that was used would not extract DNA from sperm and there was no reason to believe that the DNA derived from blood or muscle. (*See* Tr. 2699, 2700-01, 4075)

The only forensic evidence linking Mr. Holtzclaw to any of the complainants in the entire trial was a DNA profile, ultimately matched to the teenager Ms. C1 (O.R. 182, 253), that was obtained from the fly of Mr. Holtzclaw's uniform pants in the four DNA samples, which included mixtures of DNA from at least several individuals. Item #17Q1 was an indistinguishable mixture of DNA from at least 3 people and included all the alleles found in Ms. C1's DNA profile. (O.R. 187, 190) Items #17Q2 (with at least 3 contributors), #17Q3 (with at least 2 contributors), and #17Q4 (with at least 2 contributors) each had a clear and complete major profile that matched Ms. C1, while the minor contributor profiles had the possibility of allele drop-out. All four samples contained male DNA, although the forensic analyst testified that no evidence of male DNA was found in the items #17Q3 and #17Q4 (Tr. 4072) even though the quantification results on the OCPD qPCR Report for SD14-273 (10/1/2015) revealed its presence. The OCPD forensic analyst testified that Mr. Holtzclaw was excluded from being a contributor to all four DNA samples, when in fact the data were inconclusive. *Compare* (Tr.

4073) and (O.R. 182, 253, 255).

The OCPD forensic analyst informed the female detective early on with respect to June 18, 2014, the beginning of the investigation, that item #17Q2 contained the complete DNA profile of an unknown female major contributor. (Tr. 4045-46) This discovery led to a police investigation to search for the unidentified female (Tr. 423-24) by focusing only on possible consensual or criminal sexual transfer of DNA (10/2/14 Motion Hearing Tr. 16, 62).

The detectives suspected that the forcible oral sodomy allegation by Ms. C2 could be linked to an earlier sexual assault allegation against an unknown police officer by another woman, Ms. C9. (Exhibit #14; Tr. 3204, 3208-09) Ms. C9 was high on crack cocaine when she made an allegation against an unknown officer. (Tr. 3163-64) She had a mood disorder, multiple warrants, and a criminal history including drug use, prostitution arrests, and penitentiary escapes. (Tr. 3157, 3159, 3188) Ms. C9 could not positively identify her alleged assailant in a line-up (Tr. 3172) and recalled a date (Tr. 3212), a black and white patrol car color (Tr. 3302), and initially a location (Tr. 3159, 3175) that did not match the whereabouts and black color of Mr. Holtzclaw's patrol car. Eventually, it was discovered that Mr. Holtzclaw's patrol car was going faster than 25 mph at the location where Ms. C9 alleged he dropped her off, such that even the male detective admitted that "yes," she was lying about that. (Tr. 3239, 3291-92) (Mr. Holtzclaw was acquitted of Ms. C9's allegations.)

Despite these problems with Ms. C9's accusations, police used her background while developing a victim profile to search for the mystery female whose DNA was found on the fly of Mr. Holtzclaw's uniform pants. Although Ms. C2 had no warrants or drug convictions, an OCPD lieutenant created a victim profile by assuming that Mr. Holtzclaw had targeted African

American females with criminal histories and arrest warrants. (Tr. 2385-86) The lieutenant looked back through 6 months of police records prior to June 18, 2014. (Tr. 2397) He identified hundreds of women whose criminal histories had been checked by Mr. Holtzclaw, noting those whom Mr. Holtzclaw had also run for warrants, and then the lieutenant created a list containing "specifically names of black females" (Tr. 2385) "who had a drug history, prostitution history or a significant criminal history" (Tr. 2284, 2386-87). The lieutenant gave packets of the women's information to the two sex crimes detectives to use to contact them. (Tr. 2399)

The detectives then contacted these women, telling them that police had "received a tip" that the women were "possibly sexually assaulted by an Oklahoma City police officer" who "was a really bad guy." (Tr. 1975, 2218, 2250, 2273, 2322-23, 2999, 3517-18) The male detective admitted he could have told multiple interviewees that police had a lot of victims, a long list of women. (Tr. 2250, 2273) Police contacted more than 40 African American women with drug and prostitution histories and warrants. (Tr. 2269) While more than 33 women said nothing had happened (Tr. 2269), police ultimately obtained sexual assault allegations from 9 of the women.

When none of these women matched the unidentified female DNA profile, detectives then started looking at "every female he ran starting before he was put on administrative leave […] and working backwards" to find a DNA match. (Tr. 3892) This process led to a tenth complainant, Ms. C1, the last complainant identified in the case, whose DNA matched the major contributor in samples from the fly of the uniform pants. (Tr. 3933-36)

After including the three women – Ms. C2, Ms. C9, and Ms. C11 – who made sexual assault allegations without being contacted first by police, the investigation of Mr. Holtzclaw resulted in a total of 13 complainants whose allegations went to trial. Other women and one man

came forward without being contacted, but "were actually lying." (Tr. 2270, 2287-91) In total, Mr. Holtzclaw was found guilty of some or all of the allegations of 8 complainants out of the 13.

DISCUSSION

I. THE DNA EVIDENCE FROM THE FLY OF MR. HOLTZCLAW'S UNIFORM PANTS WAS HIGHLY PREJUDICIAL BUT HAD LITTLE PROBATIVE VALUE BECAUSE IT WAS CONSISTENT WITH NON-INTIMATE DNA TRANSFER AND CRUCIAL, ACCEPTED FORENSIC SCIENCE STEPS WERE OMITTED DURING EVIDENCE COLLECTION AND TESTING.

The forensic evidence consisting of DNA matching the profile of Ms. C1 along with DNA from unknown individuals was prejudicial because the location on the fly of Mr. Holtzclaw's uniform pants appeared incriminating. However, it had little probative value because the complainant's DNA profile was found without any visible stains or deposits, without any body fluid testing, and with low quantities of DNA in mixtures from unknown people, such that it can be explained by non-intimate transfer of skin cell DNA from Ms. C1, her clothes, or her possessions to Mr. Holtzclaw's hands when he searched her purse and pat-searched her, and then from his hands to the fly of his uniform pants during a restroom break. *See* Janine Helmus, Thomas Bajanowski & Micaela Poetsch, *DNA Transfer - a Neverending Story. A Study on Scenarios Involving a Second Person As Carrier*, 130 INT'L J. LEGAL MED. 121, 121-122 (2016), https://link.springer.com/article/10.1007/s00414-015-1284-1 ("every DNA transfer scenario one can imagine seems to be possible" and the sensitivity of DNA testing and possibility that DNA can transfer indirectly mean that now "nobody can be sure about the way DNA was deposited at a crime scene, neither by whom or when); *see also* Angela L. Williamson, *Touch DNA: Forensic Collection and Application to Investigations*, 18 J. ASS'N CRIME SCENE RECONSTR. 1, 3 (2011)

("Touch DNA can easily be transferred […] via day-to-day interactions, contact with furniture items/bedding, or through the laundry.").

The low probative value of the DNA in Mr. Holtzclaw's case was reduced further because the State omitted important steps during collection and testing of the uniform pants. The State did not conduct tests to distinguish between transfer of DNA with body fluid or without. The State also did not consider that DNA may have transferred innocently either before or after the alleged crime, including by contamination. *See* Peter Gill, *Analysis and Implications of the Miscarriages of Justice of Amanda Knox and Raffaele Sollecito*, 23 FORENSIC SCIENCE INT'L: GENETICS 9, 10 (2016). As a result, investigators did not take crucial steps to prevent DNA contamination of the fly of the uniform pants due to DNA indirect transfer. *See* section B4 below.

A. The DNA Evidence had a Valid Non-Sexual Explanation, Non-intimate DNA Transfer, and thus had Minimal Probative Value.

A reasonable explanation for the DNA matching Ms. C1's profile on the fly of the uniform pants is that it resulted from indirect transfer of her non-intimate skin cell DNA (Tr. 4083), which refers to DNA deposits that are invisible to the naked eye, are left behind on surfaces due to non-sexual epithelial (skin) cells or as cell-free DNA in sweat, and are "usually deposited in smaller amounts than the DNA found in bloodstains or other body fluids." Williamson at 1; *see also* Helmus *et al.* at 121 (description of "indirect, passive transfer of DNA"); Ignacio Quinones & Barbara Daniel, *Cell Free DNA As a Component of Forensic Evidence Recovered from Touched Surfaces*, 6 FORENSIC SCIENCE INT'L: GENETICS 26, 29 (2012).

Research proves that non-intimate DNA indirect transfer occurs, even to incriminating locations. DNA can transfer to an object directly from its originator (direct or primary transfer) as well as indirectly via one intermediary (termed secondary transfer) or more

intermediaries (termed tertiary or higher level transfer), such that there has been no physical contact between the original depositor and the final surface on which the DNA is located. Georgina Meakin & Allan Jamieson, *DNA Transfer: Review and Implications for Casework*, 7 FORENSIC SCIENCE INT'L: GENETICS 434, 435 (2013); Helmus *et al.* at 121-22.

Numerous studies in existence before Mr. Holtzclaw's trial began on Nov. 2, 2015, proved that non-intimate DNA indirect transfer occurs, yet none of these specific studies were brought to the jury's attention by Mr. Holtzclaw's defense attorney. (Tr. 4076-78)

The first study demonstrating non-intimate skin cell DNA primary and secondary transfer, conducted 20 years ago, showed that DNA can transfer from a person's hand to a tube and then from that tube to another person's hand. Roland A.H. van Oorschot & Maxwell K. Jones, *DNA Fingerprints from Fingerprints*, 387 NATURE 767, 767 (1997).

A study by Jones and Scott (2010), published five years before the trial, revealed that a woman's DNA can transfer indirectly from her face and hands to a man's hands, and then, after the man unzipped his pants, from his hands to his cotton underwear and even penis during simulated urination, such that the female DNA was found on 33% of the underwear sampled (50% exhibited 15+ alleles), and also on 67% of the penile swabs (1-5 alleles). Sarah Jones & Kirsty Scott, *The Transfer of DNA Through Non-intimate, Social Contact*, 50 SCIENCE AND JUSTICE 100, 104 (2010). This research was recently corroborated. Sarah Jones *et al.*, *DNA Transfer Through Nonintimate Social Contact*, 56 SCIENCE AND JUSTICE 90, 91, 95 (2016).

A study by Helmus *et al.* (2016), published online on Oct. 27, 2015, mirrored the defense scenario that Ms. C1's skin cell DNA could have transferred from her purse via Mr. Holtzclaw's hands to the fly of his uniform pants (Tr. 4076-78), because researchers found that skin cell DNA

transferred tertiarily from the neck of one individual (a donor) to cotton cloth that had been rubbed for 5 seconds on the donor's neck, then from that first cloth to the hands of a second person (the carrier), and finally from the carrier's hands to a second piece of cotton cloth. *See* Helmus *et al.* at 121, 124. DNA testing of the second cloth was able to provide the complete DNA profile of the original donor in 22% of the samples. *Id.*

Research by Cale *et al.*, first published online on Sept. 1, 2015, revealed that shaking hands with a second individual and then touching a knife can transfer the second individual's DNA, but not the handler's DNA, to the touched object. Cynthia M. Cale, Madison E. Earll, Krista E. Latham & Gay L. Bush, *Could Secondary DNA Transfer Falsely Place Someone at the Scene of a Crime?* 61 J. OF FORENSIC SCIENCES 196, 196 (2016). Other studies have obtained similar results. *See, e.g.,* Alex Lowe, Caroline Murray, Jonathan Whitaker, Gillian Tully & Peter Gill, *The Propensity of Individuals to Deposit DNA and Secondary Transfer of Low Level DNA from Individuals to Inert Surfaces*, 129 FORENSIC SCIENCE INT'L. 25, 33 (2002) ("The full DNA profile of one individual was recovered from an item that they had not touched while the profile of the person having contact with that item was not observed.").

The absence of visible staining on the fly of the uniform pants (Tr. 4084) **was consistent with non-intimate DNA transfer.** Vaginal stains may appear whitish or creamy, yet can be faint or not visible at all, and currently there are no commercial confirmatory tests for matter secreted specifically from the vagina. *See* JANE MOIRA TAUPIN & CHESTERENE CWIKLIK, SCIENTIFIC PROTOCOLS FOR FORENSIC EXAMINATION OF CLOTHING 133 (2010). However, recent research has revealed that after just two minutes of consensual sexual intercourse without ejaculation, stains are visible on men's underwear that they donned after intercourse, causing

their genitals to come into contact with the cloth of the underwear. *See* Jones *et al*. at 95. Based on these research results, there would be an expectation of visible staining on the fly of Mr. Holtzclaw's uniform pants if he had, as alleged, raped Ms. C1 for "about ten minutes" (Tr. 3773) through the unzipped fly of his buckled pants confiscated less than 24 hours later.

The complex DNA mixtures were typical of indirect transfer. Although Mr. Holtzclaw's trial defense attorney did not reveal this during the trial, the defense argument is additionally supported by the observation that the samples were mixtures of DNA from several individuals, which is typical of the complex DNA mixtures frequently found due to non-intimate DNA indirect transfer. *See* Mariya Goray, Ece Eken, R.J. Mitchell & Roland A.H. van Oorschot, *Secondary DNA Transfer of Biological Substances under Varying Test Conditions*, 4 FORENSIC SCIENCE INT'L: GENETICS 62 (2010) ("a biological substance that has been transferred multiple times, if detectable, will often appear as components of complex DNA profiles" from more than one individual because DNA may be present on the vectors on which it transferred or on the substrate from which the DNA is collected).

B. We are Concerned that the DNA Evidence's Probative Value was Reduced Further by the Omission of Critical Forensic Science Steps during Evidence Collection and Testing.

The probative value of the DNA evidence, which was low because it could be explained by non-intimate DNA indirect transfer, was reduced further because the State did not follow the crucial forensic science steps of developing, investigating, and testing alternative hypotheses during evidence collection and analysis to distinguish among three hypotheses that could explain the DNA evidence: DNA transfer in body fluid; non-intimate skin cell DNA transfer, such as via Mr. Holtzclaw's hands; contamination of the fly of the uniform pants. *See* JOHN O. SAVINO &

BRENT E. TURVEY, RAPE INVESTIGATION HANDBOOK 525 (2d ed. 2011) (explaining that forensic examiners must use the scientific method, which "means the development, investigation, and consideration of alternate hypotheses for any observations and events"); *see also id.* at 377 ("When a DNA match is found, the conditions of transfer must be investigated…."); *id.* at 366 (describing that investigators must "vigorously investigate" evidence possibly resulting from secondary transfer, including due to contamination by investigators); Williamson at 3 (explaining that "the investigator must take into account the relationship between the victim and the suspect […], and any possibility of 'innocent transfer' of DNA that may have occurred before the alleged crime," because finding the suspect's DNA on the evidence "may be of limited probative value" if the suspect had recent contact with a complainant).

Investigators do not appear to have considered the possibility of non-intimate DNA indirect transfer, as is shown by evidence handling methods that created risks of DNA contamination. *See* Itiel E. Dror, Justice Bridget M. McCormack & Jules Epstein, *Cognitive Bias and Its Impact on Expert Witnesses and the Court,* 54 JUDGES' J. 8, 12 (2015) ("[R]ather than considering only one hypothesis (typically that of the investigator requesting testing), experts should consider multiple competing hypotheses.").

1. Detectives only collected the uniform pants and belt but not underwear and penile swabs that could have offered more data to form hypotheses.

The OCPD sex crimes detectives' decision not to take Mr. Holtzclaw's underwear that he was wearing at the time of the interrogation, or to go to his home to locate the underwear he had been wearing at the time of the alleged forcible oral sodomy assault, was incorrect because the recommended procedure for sexual assault investigations is that "any item that potentially corroborates (or refutes)" an allegation "must be seized and recovered." SAVINO & TURVEY at

125; *see also* Joanne Archambault, *Forensic Exams for the Sexual Assault Suspect*, 11 SEXUAL ASSAULT REPORT 33, 33-34 (2008) (importance of seizing suspect's clothing).

The female detective gave two invalid reasons for not obtaining the underwear that Mr. Holtzclaw wore during the alleged sexual assault of Ms. C2: first, Mr. Holtzclaw said the underwear was in the washer (Exhibit #14) and she believed, possibly incorrectly, that this meant the underwear had been washed; second, she stated that the effect of a washing machine on evidence is it "washes it away" (Tr. 1164). Similarly, the OCPD forensic analyst testified that DNA evidence on clothing is washed away in a washing machine so that it is gone. (Tr. 2728)

Contrary to their beliefs, even clothing that was worn at the time of an alleged assault and subsequently washed should be confiscated because machine-washed underwear can yield DNA evidence and provide complete DNA profiles, including from sperm, vaginal fluid, or blood deposited prior to washing. *See* E. Kafarowski, A.M. Lyon & M.M. Sloan, *The Retention and Transfer of Spermatozoa in Clothing by Machine Washing*, 29 CAN. SOC'Y FORENSIC SCI. J. 7, 7 (1996); *see also* Sarah Noël, Karine Lagace, Anita Rogic, Dominic Granger, Sarah Bourgoin, Christine Jolicoeur & Diane Séguin, *DNA Transfer During Laundering May Yield Complete Genetic Profiles*, 23 FORENSIC SCIENCE INT'L: GENETICS 240, 243-245 (2016); Thomas Kamphausen *et al.*, *Everything Clean? Transfer of DNA Traces Between Textiles in the Washtub*, 129 INT'L J. LEGAL MED. 709, 711 (2015) (finding full DNA profiles from washed blood stains).

Additionally, the OCPD detectives erred by choosing not to initiate a thorough forensic exam of Mr. Holtzclaw, not even a penile swab. Investigators should complete a forensic exam of the suspect's body, including a physical exam with penile swabs when the suspect is male, and should use an Alternate Light Source to find possible body fluid stains on the suspect's body

when less than 24 hours have elapsed since an alleged sexual assault, regardless whether the suspect has bathed and changed clothes. *See* United States Department of Defense, *Sexual Assault Prevention and Response Office, DD Form 2911 Instructions (Suspect)* 1, 8 (Nov. 2011), http://www.sapr.mil/public/docs/miscellaneous/toolkit/DD_Form_2911-suspect_Instructions.pdf (last visited Oct. 25, 2016); *see also* Archambault at 33 ("One source of evidence that is critically important, but all too often overlooked in a sexual assault investigation, is the suspect examination."); SAVINO & TURVEY at 165 ("In cases involving suspected sexual assault, victim *and* suspect examinations are a part of standard forensic protocol.").

2. The State's forensic analyst completed no tests for body fluids, not even use of an Alternate Light Source.

The DNA profile matching Ms. C1 lacked probative value because the OCPD forensic analyst did not test the uniform pants and belt for the possible presence of body fluids, choosing instead to view the uniform pants only with bright light and a magnifying glass. The forensic analyst omitted the use of an Alternate Light Source to identify possible latent stains that fluoresce, including saliva, semen, and vaginal fluid, and she performed no presumptive tests for saliva. (Tr. 4075, 4078-79, 4084); *see also* TAUPIN & CWIKLIK at 18-19.

The forensic analyst's reason for not testing the pants for saliva after Ms. C2's allegation of oral sodomy reveals that she did not consider the possibility of non-intimate DNA indirect transfer: "At the time I felt that an amylase test would not have aided anybody in the investigation of this particular case." (Tr. 4092)

The OCPD forensic analyst's decision to do no body fluid testing was incorrect because body fluid traces are one of the most important types of evidence to forensic investigators, especially when non-intimate DNA transfer is a reasonable possibility as in Mr. Holtzclaw's

case. Identifying a fluid can impact the trial verdict, and therefore the first step of DNA profiling should be to examine the exhibits to detect the presence of body fluids and identify them by using light sources and chemical tests. *See* INTERPOL DNA MONITORING EXPERT GROUP, INTERPOL HANDBOOK ON DNA DATA EXCHANGE AND PRACTICE 30 (2nd ed. 2009); *see also* TAUPIN & CWIKLIK at 140 ("Methods for locating and sampling biological stains are essential to the successful interpretation of DNA analysis and identification of body fluids….").

It is agreed that Mr. Holtzclaw and Ms. C1 had non-sexual contact. This is why the mere presence of a DNA profile cannot be attributed to sexual activity without supporting evidence of body fluid identification. Finding DNA on a suspect's clothing "has an entirely different probative value when DNA originates from the epithelium" vs. body fluids. Joanna Jakubowska, Agnieszka Maciejewska & Ryszard Pawłowski, *mRNA Profiling in Identification of Biological Fluids in Forensic Genetics*, 87 PROBLEMS OF FORENSIC SCIENCES 204, 204 (2011).

3. The State did not investigate the source of unknown female and male DNA that could support the hypothesis of non-intimate DNA indirect transfer.

Discovering unexplained and unexpected DNA from a mixture of individuals, including at least one unidentified male, on the fly of Mr. Holtzclaw's uniform pants required consideration of who may have contributed to the DNA samples and the chain of events that led to the DNA being present so that the likelihood of alternative scenarios could be assessed, yet both the State's investigators and Mr. Holtzclaw's trial defense attorney did not do this. *See* SAVINO & TURVEY at 321 (explaining that the meaning of DNA evidence "cannot be interpreted unless the conditions" of contact "and evidence transfer have been reconstructed carefully using other physical evidence"); *see also* Williamson at 4 (stating that when a male profile that does not match a suspect is obtained from a non-intimate skin cell DNA sample relating to a female

complainant, then the relevance of the male DNA to the case must be considered); Roland A.H. van Oorschot, Kaye N. Ballantyne & R. John Mitchell, *Forensic Trace DNA: A Review*, 1 INVESTIGATIVE GENETICS 1, 12 (2010) (explaining that police must make greater efforts to investigate the possible chain of events leading to DNA transfer).

The State omitted investigating whether Ms. C1's male and female friends, with whom she was stopped, could have contributed alleles to the DNA samples, which would support the scenario that non-intimate DNA from all three individuals transferred to Mr. Holtzclaw's hands when he questioned them. (Tr. 3801-03); *see also* Williamson at 4 (noting DNA "elimination samples" should be obtained from individuals who may have contributed to DNA mixtures).

4. We are concerned that the State's handling of the evidence could cause contamination that may have transferred DNA from Ms. C1 and others to the fly of the uniform pants.

Lastly, the DNA from the fly of the uniform pants had little probative value because the State did not undertake crucial and accepted forensic science steps to prevent the possibility of DNA contamination by investigators during evidence collection, storage, or examination. *See* Joel D. Lieberman, Terance D. Miethe, Courtney A. Carrell & Daniel A. Krauss, *Gold Versus Platinum: Do Jurors Recognize the Superiority and Limitations of DNA Evidence Compared to Other Types of Forensic Evidence?* 14 PSYCH. PUB. POL. & L. 27, 31 (2008) (explaining that police may contaminate evidence while collecting and storing an exhibit inappropriately); *see also* Oorschot *et al.* at 11 ("Contamination is a crucial issue in the analysis and interpretation of trace DNA."). Also, staff elimination DNA samples from the detectives and other investigators do not appear to have been compared with the DNA samples from the fly of the uniform pants.

Five possible routes can be identified by which DNA may have contaminated the fly of Mr. Holtzclaw's uniform pants. The trial defense attorney mentioned none of them.

First, alleles from unidentified individuals, including at least one male, could have arisen from the female and male sex crimes detectives during their interrogation of Mr. Holtzclaw due to secondary transfer via pens that they handed to him, after which he rubbed his pants frequently, ultimately touching his Velcro belt and possibly the fly of the uniform pants while unzipping them, as revealed in the interview video. (Exhibit #14)

Second, contamination of the uniform pants and belt may have occurred due to DNA transfer after the male detective violated proper evidence collection procedure by failing to wear DNA-free gloves and instead pushing his bare hand into the evidence bag before Mr. Holtzclaw placed his pants and belt in the bag. *Id.*; *see* SAVINO & TURVEY at 366 (DNA contamination).

Third, detectives violated standard procedures for evidence collection by packaging two items, the uniform pants (Item #17) and the belt (Item #18), in the same evidence bag, creating the potential for cross-contamination of DNA from Ms. C1 as well as other individuals from the belt to the fly of the uniform pants during transportation and storage. *See* SAVINO & TURVEY at 157; *see also* INTERPOL DNA MONITORING EXPERT GROUP at 27 ("Never pack several items/objects together.").

Fourth, DNA from Ms. C1 and other individuals that may have been present on less incriminating locations of the pants may have transferred to the fly within the evidence bag, or vice versa, since research demonstrates significant quantities of DNA often transfer from one area to another on the same exhibit or other exhibits inside a single bag. *See* Mariya Goray, Roland A.H. van Oorschot & John R. Mitchell, *DNA Transfer within Forensic Exhibit*

Packaging: Potential for DNA Loss and Relocation, 6 FORENSIC SCIENCE INT'L: GENETICS 158, 165-166 (2012).

Fifth, the photo taken by the OCPD forensic analyst of the uniform pants (State's Exhibit #392) shows that they were in contact with what appears to be a red brick surface in one corner of the photo, which raises contamination concerns because brick is not part of a lab bench. *See* Bianca Szkuta, Michelle Harvey, Kaye Ballantyne & Roland R.H. van Oorschot, *DNA Transfer by Examination Tools – a Risk for Forensic Casework?* 16 FORENSIC SCIENCE INT'L: GENETICS 246, 246 (2015) (demonstrating DNA contamination of evidence items via lab tools and gloves).

II. THE STATE MISINTERPRETED THE DNA ANALYSIS AND MADE ARGUMENTS THAT MISREPRESENTED THE DNA EVIDENCE FROM THE FLY OF MR. HOLTZCLAW'S UNIFORM PANTS.

As described in Mr. Holtzclaw's brief (p. 44), the State and its forensic analyst misrepresented the forensic evidence by arguing, incorrectly, that vaginal fluid was likely to be present and the speculative presence of undetected vaginal fluid (Tr. 4073, 4087-89) was supported by the discovery of DNA matching Ms. C1's profile, by incorrectly asserting that no male DNA was present in items #17Q3 and #17Q4 (Tr. 4072), and by incorrectly excluding Mr. Holtzclaw as a potential contributor to the four DNA samples from the fly of the uniform pants (Tr. 4059, 4072). The prosecutor also claimed facts not in evidence when he claimed in his closing statement that it was a "fact" that C1's DNA transferred in vaginal fluids. (Tr. 4307)

Mr. Holtzclaw's trial counsel neither forced the prosecution's DNA analysis errors to be revealed during cross-examination of the forensic analyst, nor objected to prosecutorial misrepresentations of the forensic evidence. Trial defense counsel did not make the forensic analyst admit that male DNA was present in all four samples from the fly of the uniform pants,

and so the implications of this DNA were never addressed. We are concerned that Mr. Holtzclaw's representation was therefore ineffective because criminal justice and DNA experts note that in order "to completely represent an individual incriminated by DNA evidence," defense counsel must "look behind the laboratory report to determine whether the lab's conclusions are well supported, and whether there is more to the story than the report tells." William C. Thompson, Simon Ford, Travis Doom, Michael Raymer & Dan E. Krane, *Evaluating Forensic DNA Evidence: Essential Elements of a Competent Defense Review*, Part 1, 27 THE CHAMPION 16, 19-21 (April 2003). Effective defense counsel must uncover, understand, and explain ambiguities in the DNA evidence, with one source of ambiguity being mixtures of DNA from several individuals because these "mixtures are difficult to interpret." *Id.*

However, the prosecutor's incorrect argument that the discovery of DNA matching Ms. C1 and the presumed absence of Mr. Holtzclaw's DNA together suggested the likely presence of vaginal fluid is a trial error that was preserved for appellate review, because the Court sustained the trial defense counsel's objection to the prosecutor's use of hypotheticals when the prosecutor asked the OCPD analyst if she had an opinion, based on her conclusion that Mr. Holtzclaw's DNA was absent, about whether it would be "more likely then if the secondary transfer was from Officer Holtzclaw's penis going into [C1's] 17-year-old vagina." (Tr. 4087)

A. The State's Forensic Analyst Incorrectly Used the Presence of DNA Matching Ms. C1's Profile to Argue that Vaginal Fluid was the Likely Source.

The State's forensic analyst made three errors while inappropriately using a DNA profile matching Ms. C1 to infer that vaginal fluid was likely to be present. (Tr. 4073)

First, the analyst's subjective claim that it was "a very good possibility" that, as the prosecutor phrased it, DNA matching Ms. C1's profile was "much more likely […] to be

transferred if the epithelial cells are contained in a liquid such as vaginal fluid," (Tr. 4073) was not founded objectively upon the evidence since no visible stains or deposits were observed, no body fluid tests were done, and the forensic analyst herself could not rule out the possibility of non-intimate DNA indirect transfer from the teenager's purse via Mr. Holtzclaw's hands to the fly of his uniform pants. (Tr. 4083); *see also* SAVINO & TURVEY at 526 ("In cases of sexual assault, the need for critical analysis mandated by objective science is especially important.").

Second, the OCPD forensic analyst inappropriately used DNA profiles alone to compare the likelihood of DNA transfer via vaginal fluid, which she felt was "a very good possibility" (Tr. 4073), vs. indirect transfer of non-sexual skin cell DNA from the teenager, about which she replied, "I can't disagree with that," when asked by trial defense counsel if she agreed that non-intimate DNA indirect transfer ("secondary transfer") could have occurred (Tr. 4083).

The forensic analyst's preference for vaginal fluid transfer was incorrect because a DNA profile alone does not inform about "when, where, how or why" DNA transfer occurred. Gill at 13. Scientific articles establish "the possibility, but not the probability, of DNA transfer." Meakin & Jamieson at 442; *see also* Ane Elida Fonneløp, Thore Egeland, & Peter Gill, *Secondary and Subsequent DNA Transfer During Criminal Investigation*, 17 FORENSIC SCIENCE INT'L: GENETICS 155, 155 (2015) (explaining that "research to evaluate the risks of passive transfer has not kept pace with" the development of increasing sensitivity of DNA analysis kits).

Third, the forensic analyst testified beyond the forensic science professional expertise when she said of the teenager, Ms. C1, that "a young woman of her age would be very likely to have quite a bit of lubrication" that could transfer cells. (Tr. 4065) The analyst then did not

explain the contradiction between her argument that vaginal fluid should be plentiful and her observation that nothing suspicious was visible on the fly of the uniform pants. (Tr. 4084)

B. The State Argued Incorrectly that the Exclusion of Mr. Holtzclaw as a Contributor to the DNA Mixtures Supported a Rape Scenario.

The prosecutor presented a flawed argument that vaginal fluid was likely to be present on the fly of the uniform pants, claiming that if Mr. Holtzclaw had transferred Ms. C1's non-intimate skin cell DNA via his hands to the fly of his pants, which "common sensically" he would have had to unzip and touch when urinating, then you would also expect to find Mr. Holtzclaw's DNA in those locations. (Tr. 4087-89) This flawed argument was premised on the OCPD forensic analyst's unscientific claims that items #17Q3 and #17Q4 from inside the fly of the uniform pants contained no Y chromosome and thus lacked evidence of male DNA (Tr. 4072), no DNA from Mr. Holtzclaw was found in any of the four samples, and an absence of his DNA was "very difficult to try and explain." (Tr. 4073, 4087-89); *see also* SAVINO & TURVEY at 365 ("DNA results can be incomplete or misleading, and therefore prone to misuse.")

1. The State's forensic analyst testified that she found no evidence of male DNA in samples #17Q3 and #17Q4, yet low levels of male DNA were detected.

As stated in Mr. Holtzclaw's brief (p. 44), contrary to the OCPD forensic analyst's testimony that she had found no evidence of male epithelial cell DNA in items #17Q3 and #17Q4 from the inside of the fly of the uniform pants (Tr. 4072), the DNA quantification results showed the presence of low levels of male DNA in both items, which had male DNA concentrations of 0.0102 and 0.0117 ng per microliter and a ratio of male to female DNA of 1:20 and 1:21, respectively. (DNA Quant Summary and OCPD qPCR Report for SD14-273, dated 10/1/2015)

The OCPD forensic analyst should have known there was male DNA in items #17Q3 and #17Q4 because she herself initialed the page on which the male DNA data appeared in plain view in a column labeled "Qty Male." (OCPD qPCR Report for SD14-273, dated 10/1/2015)

2. We dispute the State's forensic analyst testimony that Mr. Holtzclaw could be excluded from all four DNA samples from the fly of the uniform pants.

When the prosecutor asked, "So even though Officer Holtzclaw was wearing these pants, his DNA is not inside them; correct?" and the forensic analyst replied, "That is correct," (Tr. 4072) her subjective statement showing 100% certainty that Mr. Holtzclaw was excluded as a contributor to the four DNA samples is an example of an error frequently made by expert witnesses, which is to overstate the probative value of the evidence and go "far beyond what the relevant science can justify." PCAST Report at 29.

The exclusion of Mr. Holtzclaw as a contributor to the DNA samples from the fly of the uniform pants (Tr. 4072) was wrong for four reasons.

First, the OCPD forensic analyst never used Y-STR profiling to analyze the male (Y) chromosome DNA variations in items #17Q3 and #17Q4 to determine whether they could have derived from Mr. Holtzclaw. *See* TAUPIN & CWIKLIK at 136 (usefulness of Y-STR profiling). Therefore, excluding Mr. Holtzclaw as a contributor was an error.

Second, the allele data were inconclusive as to whether Mr. Holtzclaw could be excluded or not from the four DNA mixtures, which had numerous alleles below the stochastic threshold, meaning that one cannot assume their sister alleles from paired chromosomes were detected during testing. (O.R. 182, 187); *see also* JOHN M. BUTLER, ADVANCED TOPICS IN FORENSIC DNA TYPING: INTERPRETATION 93 (1st ed. 2015) (definition of stochastic threshold). Conclusively excluding Mr. Holtzclaw as a contributor to the four DNA samples was incorrect because, when

analyzing DNA mixtures from more than one individual where some alleles are below the stochastic threshold, one cannot know the complete DNA profile of every contributor due to the possibility of allele drop-out or drop-in caused by stochastic effects in PCR amplifications with low DNA quantities, the possibility of significant allele sharing among individuals, and the possibility of contamination by alleles from environmental background DNA. (O.R. 182, 187); *see also* BUTLER at 454 (explaining reasons for inconclusive results).

Calculating the weight of evidence towards exclusion of DNA from Mr. Holtzclaw or any of the complainants from the four DNA mixtures, for which allele drop-out was a possibility, can only be carried out by using a probabilistic statement such as a likelihood ratio (LR), which was not utilized by the OCPD forensic analyst. *See* BUTLER at 295 (explaining that "LRs involve a comparison of the probabilities of the evidence under two alternative propositions," such as the DNA came "from the suspect" vs. "from an unknown person out in the population at large").

For instance, items #17Q1 (from the outside of the fly) and #17Q2 (from an interior flap) were complex mixtures, defined as "mixtures with more than two contributors" that superimpose multiple individual DNA profiles for which alleles may be missing or may overlap with each other, such that examiners must ask what the probability is that an individual's DNA profile could be present within the mixture profile, rather than use an inclusion/exclusion approach. *See* PCAST Report at 75-76.

In fact, item #17Q1 may have derived from at least 4 individuals due to the presence of 7 alleles at one locus. (O.R. 187); *see also* SCIENTIFIC WORKING GROUP ON DNA ANALYSIS METHODS, SWGDAM INTERPRETATION GUIDELINES FOR AUTOSOMAL STR TYPING BY FORENSIC DNA TESTING LABORATORIES 7 (2010) (explaining how to calculate the minimum number of

contributors). There is some debate in the forensic community about using likelihood ratios for 4 or more contributors. *See* PCAST Report at 8, 80-81 (explaining that "substantially more evidence is needed to establish foundational validity" for using likelihood ratios for mixtures with 4 or more contributors). However, some laboratories calculate likelihood ratios for such mixtures using specialist probabilistic software that can take account of stochastic effects and peak imbalance, yet the OCPD lab did not use or attempt to use appropriate software. *See id.*

The forensic analyst's testimony excluding Mr. Holtzclaw as a potential contributor to the DNA mixtures was therefore an error because it was based on a subjective assessment rather than an objective one. *See* PCAST Report at 8 ("[S]ubjective analysis of complex DNA mixtures has not been established to be foundationally valid and is not a reliable methodology."); *see also* Boies at 407, 414 (noting that DNA testing, analysis, and interpretation are affected by human error because forensic analysts interpret results subjectively).

Third, even on a subjective basis, Mr. Holtzclaw cannot be excluded as a contributor to items #17Q1 and #17Q2 because the majority of the alleles present in Mr. Holtzclaw's DNA profile (including sex chromosomes) are present in both items. The number of alleles in common with Mr. Holtzclaw equals 27 out of 32 alleles in #17Q1 and 22 out of 32 alleles in #17Q2, albeit at a low level. (O.R. 187) Similarly, Mr. Holtzclaw's DNA could be present in DNA items #17Q3 and #17Q4 at a low level as a minor contributor because these mixtures contain 19 and 21 alleles matching those of Mr. Holtzclaw, respectively, out of 32 alleles in total, with many of the matching alleles being present below the stochastic threshold while others could be shared with the major contributor matching Ms. C1's DNA profile. (O.R. 255)

Fourth, the OCPD forensic analyst should not have excluded Mr. Holtzclaw as a potential contributor to items #17Q2, #17Q3, and #17Q4 during her testimony because this erroneous conclusion conflicted with her own OCPD forensic examination reports, in which she stated correctly that in item #17Q2 "the minor component is not suitable for comparison purposes due to insufficient data," and in items #17Q3 and #17Q4 the minor contributors were "not suitable for comparison purposes, due to insufficient genetic material." (O.R. 182, 253) Such statements mean that the results are inconclusive, being insufficient to clearly exclude, or not exclude, an individual's DNA profile. *See* BUTLER at 454.

The OCPD forensic scientist's testimony excluding Mr. Holtzclaw from being a potential contributor also contradicted the OCPD DNA Laboratory STR Interpretation Procedure Manual guidelines (Issue Date 11/17/13), which state that an "inconclusive" conclusion is to be arrived at when there is "insufficient data," "mixtures of DNA from multiple donors," or "stochastic effects resulting in allelic drop-out," which were issues with the DNA samples.

3. The State's forensic analyst displayed lack of awareness that touching an item may not deposit one's own DNA.

When the OCPD forensic analyst claimed that an absence of Mr. Holtzclaw's DNA was "very difficult to try and explain" (Tr. 4073), which was used to support the prosecution's argument that Ms. C1's DNA was unlikely to have transferred innocently via Mr. Holtzclaw's fingers (Tr. 4087-89), the forensic analyst ignored scientific research, available before the trial, that proved people can transfer someone else's DNA that is on their hands without transferring their own DNA to objects they touch. *See* Meakin & Jamieson at 437; *see also* Cale *et al.* at 196, 202. She also ignored research revealing that people do not always transfer their own DNA ("wearer DNA") in detectable levels to their own clothing or to touched objects, and even

repeatedly touching an object does not necessarily deposit DNA. *See* Meakin & Jamieson at 442; *see also* Michelle Breathnach, Linda Williams, Louise McKenna & Elizabeth Moore, *Probability of Detection of DNA Deposited by Habitual Wearer and/or the Second Individual Who Touched the Garment,* 20 FORENSIC SCIENCE INT'L: GENETICS 53, 58 (2016) (demonstrating that wearer DNA was not detected in a significant number of samples from the waistband of men's underpants in a study published online on October 17, 2015); Mariya Goray & Roland A.H. van Oorschot, *The Complexities of DNA Transfer During a Social Setting*, 17 J. OF LEGAL MEDICINE 82, 90 (2015) (discovering that "in many instances even a simple primary contact did not result in detectable deposit of participant's own DNA," even with lengthy, repeated contact).

Studies of people's "shedder status" reveal that some individuals at various times do not readily deposit their own DNA, which could account for not finding all of Mr. Holtzclaw's alleles in the four samples from the fly of the uniform pants. *See* Meakin & Jamieson at 437-438; *see also* Ane Elida Fonneløp, Merete Ramse, Thore Egeland & Peter Gill, *The Implications of Shedder Status and Background DNA on Direct and Secondary Transfer in an Attack Scenario*, 29 FORENSIC SCIENCE INT'L: GENETICS 48, 59 (2017) (concluding that an individual's shedder status significantly influences the probability of DNA direct and secondary transfer, and a low shedder may not transfer detectable DNA).

C. The State's Forensic Analyst did not Testify Clearly about the Presence and Implications of DNA from At Least One Male.

If the non-semen DNA mixtures from several unknown individuals including at least one male in the four samples from the fly of the uniform pants had been reported and discussed thoroughly by the prosecution and trial defense attorney, then these results would be expected to

have undermined the prosecution's argument that sexual assault was the most likely explanation for the discovery of DNA matching Ms. C1's profile on the outside and inside of the fly of Mr. Holtzclaw's uniform pants. The implication of finding male DNA is that it demonstrates an individual's DNA can transfer to the fly of the uniform pants without any involvement of that individual's vaginal fluid, since males do not make vaginal fluid.

Furthermore, it is expected that male DNA in item #17Q1 came from at least one male who is not Mr. Holtzclaw based on the strength of the Y chromosome allele and the fact that Mr. Holtzclaw could not definitively be included in this mixture. Yet the method by which this male DNA transferred was not investigated even though it could be the same method by which DNA matching Ms. C1's profile transferred to the fly of the uniform pants.

During the trial, the prosecutor and the State's forensic analyst never overtly disclosed the presence of at least one male contributor in the DNA samples, nor did defense counsel observe there was male DNA in the samples. (Tr. 4044, 4056, 4073) As previously explained, the State's forensic analyst claimed incorrectly that there was no evidence of male DNA in items #17Q3 and #17Q4. (Tr. 4072) She also never testified overtly that male DNA was found in item #17Q1 in close to equal proportions with the female DNA (Tr. 4042), indicating approximately a ratio of about half male DNA to half female DNA in this sample. The forensic analyst also dismissed the importance of the Y chromosome in item #17Q2, simply testifying that "the X is in black and the minor contributor is a Y, but it's in red so it really basically doesn't count," and "the statement that best suits that minor contributor is that it is not suitable for comparison purposes." (Tr. 4044, 4056)

D. The Prosecutor Misstated the DNA Evidence During Closing Argument.

As described in Mr. Holtzclaw's brief (p. 36), the prosecutor fundamentally mischaracterized the forensic evidence during his closing argument when he claimed it was a "fact" that Ms. C1's 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." (Tr. 4307) This statement was not a scientific inference because a basic tenet of science is that one cannot claim the presence of a substance for which one has not tested, and specific biochemical confirmatory tests are required to associate a biological fluid to DNA evidence. *See* Jakubowska *et al.* at 204.

The prosecutor also misled the jury by implying that finding the DNA only on the fly of the uniform pants and nowhere else was especially incriminating, when he knew full well that only the fly was tested because he himself had requested that the lab specifically "analyze the inside crotch area of the pants, for female DNA," as stated in the "OCPD Lab Services Division – Request for Analysis Form" on Sept. 28, 2015. (O.R. 586; Tr. 4059)

III. THE DNA EVIDENCE FROM THE FLY OF THE UNIFORM PANTS WAS ESPECIALLY INFLUENTIAL AND PIVOTAL IN MR. HOLTZCLAW'S TRIAL, AND THEREFORE MISCHARACTERIZATION OF THE EVIDENCE WAS HARMFUL.

Court opinions emphasize the particular harm caused by prosecutorial misconduct involving DNA evidence. *See, e.g., Duncan*, 322 S.W.3d at 85, 87-93; *Whack v. State*, 73 A.3d 186, 195-202 (Md. 2013) (reversing murder conviction based on prosecution's misuse of DNA evidence), *citing, inter alia*, *Duncan*; *Commonwealth v. Mattei*, 920 N.E.2d 845, 858-859 (Mass. 2010) (new trial warranted where testimony that defendant was not excluded as a source of DNA was presented without a statistical explanation of that fact's significance, and where prosecution

emphasized in closing that defendant's DNA was consistent with that of a profile found in the victim's apartment); and *State v. Bloom*, 516 N.W.2d 159, 169 (Minn. 1994) ("Prosecutors and trial courts are cautioned that we will not hesitate to award a new trial to a defendant if our review of the trial record reveals that quantitative or qualitative DNA identification evidence was presented in a misleading or improper way.").

The DNA evidence from the fly of Mr. Holtzclaw's uniform pants and its mischaracterizations were likely to have a large, prejudicial effect and therefore impact the trial verdict because jurors overvalue DNA evidence, especially when a DNA match is found in weak circumstantial cases such as Mr. Holtzclaw's. *See* Lieberman *et al.* at 27 (explaining that "a mystical aura of definitiveness often surrounds the value of DNA evidence to exonerate the innocent and convict the guilty" and jurors appear to overvalue DNA evidence); *see also* Stephanie Dartnall & Jane Goodman-Delahunty, *Enhancing Juror Understanding of Probabilistic DNA Evidence*, 38 AUSTRALIAN J. OF FORENSIC SCIENCES 85, 88 (2006) ("[R]esults illustrate the powerful and persuasive impact of DNA match evidence on juror decisions.").

However, we are concerned that the harmful impact of the DNA evidence errors runs much deeper, to the heart of the trial, because the State obtained most of its evidence against Mr. Holtzclaw by building a biased investigation upon the OCPD forensic analyst's flawed conclusion that sexual contact best explained the DNA evidence. *See* Kassin *et al.* at 50 (explaining that corrupted forensic science conclusions can influence other lines of evidence).

A. Jurors were Likely to Place Enormous and Excessive Faith in the DNA Evidence, such that It Would Have an Unduly Large Influence on Their Verdict.

As researchers and the Courts have recognized, DNA evidence in general is highly prejudicial due to its "aura of infallibility." *Commonwealth v. Curnin*, 565 N.E.2d 440, 441

(Mass. 1991), *see also Duncan*, 322 S.W.3d at 93 (recognizing the "immense weight jurors are apt to accord DNA evidence"). DNA evidence has such persuasive powers that, legal commentators have noted, "[w]hen DNA evidence is introduced against an accused at trial, the prosecutor's case can take on an aura of invincibility" and the DNA evidence resists defense challenges. Robert Aronson & Jacqueline McMurtrie, *The Use and Misuse of High–Tech Evidence By Prosecutors: Ethical and Evidentiary Issues*, 76 FORDHAM L. REV. 1453, 1469 (2007); *see also* Lieberman *et al.* at 44 (observing that "after damaging cross-examination testimony […], jurors were still more likely to convict when DNA evidence existed compared to other types of evidence").

The DNA evidence in Mr. Holtzclaw's trial, despite its low probative value, is also expected to have been valued heavily by the jury because the complainants had severe credibility issues, the additional circumstantial evidence was weak, and two jurors stated publicly that the DNA evidence was crucial in the jury's deliberations.

1. Research shows that jurors often overvalue the weight of DNA evidence, even when it lacks probative value, especially in circumstantial cases.

Studies demonstrate that jurors weigh DNA evidence very heavily, finding it to be the most accurate and persuasive type of evidence compared to other types of forensic evidence. Lieberman *et al.* at 34-37 (explaining that in a psychological study of 383 University of Nevada students and 233 Nevada jurors, participants rated DNA evidence as the most accurate and persuasive evidence of a suspect's guilt, as compared to fingerprint evidence, hair evidence, a suspect's confession, identification by victim, or eyewitness identification). Archival research of actual juries found they were 33 times more likely to reach a guilty verdict when sexual assault

trials involved DNA evidence. Jane Goodman-Delahunty & Lindsay Hewson, *Enhancing Fairness in DNA Jury Trials*, 392 TRENDS & ISSUES IN CRIME AND CRIMINAL JUSTICE 1, 1 (2010).

Even when DNA evidence is of little or no probative value, it carries a disproportional weight compared to other types of evidence considered by jurors. Mark Findlay, *Juror Comprehension and the Hard Case - Making Forensic Evidence Simpler*, 36 INT'L J. OF LAW CRIME AND JUSTICE 15, 25-28 (2008).

Jurors have been found to place "heavy and perhaps disproportionate reliance on the probative value of DNA," an advantage that has "pre-trial origins," such that "the prosecution is at a unique advantage by means of its simple introduction." *Id.* at 41. Studies of mock jurors reveal that some have a pre-trial, pro-prosecution bias that forensic evidence is nearly infallible and conclusively identifies the guilty party, and this bias, which can be measured by the Forensic Evidence Examination Bias Scale (FEEBS) questionnaire, makes jurors more likely to ascribe higher strength to weak, ambiguous DNA evidence and convict the defendant. *See* Lisa L. Smith & Ray Bull, *Validation of the Factor Structure and Predictive Validity of the Forensic Evidence Evaluation Bias Scale for Robbery and Sexual Assault Trial Scenarios*, 20 PSYCHOLOGY, CRIME & LAW 450, 456, 458, 462-64 (2014).

Research on mock jurors' reactions to DNA evidence involving statistical probabilities of a DNA match, which parallels Mr. Holtzclaw's trial, showed that DNA evidence in a weak, circumstantial criminal case significantly increased the conviction rate, and merely mentioning a DNA match caused mock jurors to be more than 15 times more likely to convict, underscoring the power of a match. *See* Dartnall & Goodman-Delahunty at 88. A third of the mock jurors convicted the defendant, regardless of the probative value of the DNA evidence. *Id.* at 89.

Interviews of actual jurors in six New South Wales criminal trials in which the only evidence was circumstantial, as in Mr. Holtzclaw's case, also revealed that jurors usually considered the DNA evidence to be "more influential than objectively its probative value should have established" in trials leading to a guilty verdict, and most jurors agreed that forensic evidence was more important than other types of evidence during deliberation and was "crucial in proving the prosecution case and hence the guilt" of the accused. Findlay at 25, 27.

2. The DNA evidence, although of little probative value, was particularly influential because of complainants' credibility issues and the weakness of the other circumstantial evidence.

The DNA match to the teenager, Ms. C1, was the lynchpin in Mr. Holtzclaw's trial not only because jurors tend to give DNA evidence more weight than it is due, but also because all of the complainants had significant credibility issues, and the government's evidence was circumstantial and weak due to the prosecution's heavy reliance on imprecise, inaccurate, and inconsistent patrol car AVL data that proved Mr. Holtzclaw had interacted with the complainants yet was not proof of sexual assault. (Tr. 914, 2743, 2939); *see also United States v. Bonds*, 12 F.3d 540, 567-568 (6th Cir. 1993) ("The aura of reliability surrounding DNA evidence does present the prospect of a decision based on the perceived infallibility of such evidence, especially in a case such as this where the evidence is largely circumstantial."); Dartnall & Goodman-Delahunty at 88; Findlay at 25, 27.

The DNA evidence was pivotal in the trial because the 13 complainants had severe credibility issues, including drug use, psychiatric troubles, criminal arrests or convictions, inconsistent testimony, or a combination thereof. Not only the five women whose allegations led to acquittals had such issues, but so did the eight complainants (C1 – C8), described below,

whose allegations led to guilty verdicts.

The teenager, Ms. C1, testified that she had "a lot of […] psychiatric" problems (Tr. 3798) and had been to treatment for trying powder cocaine, meth, and PCP in the past and still smoked marijuana (Tr. 3843). On the morning of June 17, 2014, the day of the alleged sexual assault, Ms. C1's mother filed a disorderly conduct (assault and battery) complaint against her daughter, Ms. C1, for hitting her mother four or five times on the arm and face. (Tr. 3882-83, 3950) During a detective interview, Ms. C1's mother stated that when she saw her daughter late that night after the disorderly conduct complaint was filed, her daughter simply said that she had "met this really hot cop." (Tr. 3948) Ms. C1 was later arrested twice for engaging in physical fights with other individuals after June 17, 2014. (Tr. 3787-89)

Ms. C2, a 57-year old woman who was driving although her license had been suspended for more than 30 years (Tr. 543, 571), said she had taken PM aspirin for a headache (Tr. 256) and smoked marijuana a couple hours prior to driving, testifying that she got high "earlier when I was young" (Tr. 470) but she was not high that evening because she took just one hit (Tr. 469). Her police interview report on the morning of the alleged assault, however, stated that Ms. C2 said she had smoked two marijuana cigarettes (Tr. 537, 757), which she denied at the trial. No forensic evidence supported Ms. C2's forcible oral sodomy allegations since her SANE kit came back negative and no fingerprints or DNA corroborated her account that she and Mr. Holtzclaw had placed their hands on the top of the patrol car. (Tr. 482, 508, 1095-96, 4038)

Ms. C3 smoked crack with her paid house cleaner, another complainant (Tr. 2325), was "obviously intoxicated" when she arrived to testify (Tr. 1855), and told the Court that she had only taken her prescription medicine and nothing else, yet her drug test then came back positive

for PCP (Tr. 1862-63). At one point she refused to testify and tried to leave, but police detained her for disorderly conduct and public intoxication. (Tr. 1857) Ms. C3 then testified with PCP in her system. The male detective told the Court, outside of the jury's hearing, "I've spent a lot of time with her and she's – you're right […] she's got kind of a fried brain." (Tr. 1868)

Ms. C4 used crack cocaine purchased with her prostitution money (Tr. 2524), was getting high on crack on the night Mr. Holtzclaw stopped her (Tr. 2526), and testified while in custody due to relapsing in her drug use program (Tr. 2519). She had multiple felony convictions (Tr. 2609-10) and a documented history of lying to the police (Tr. 2579). The forensic evidence did not support Ms. C4's allegation that Mr. Holtzclaw had orally sodomized her, because she said that afterwards she wiped the liquid from her mouth onto a chair, but testing the chair back for seminal fluid gave a negative result, and swabbing it for non-semen DNA revealed a complete profile of an unknown male who was not Mr. Holtzclaw. (Tr. 2703, 2705, 2726, 2729; O.R. 256-57)

Ms. C5 had two robbery convictions, one involving use of a firearm, and had been sentenced to 25 years total in prison. (Tr. 2865-67) She admitted she had cocaine and alcohol in her system (Tr. 2855) on the evening she alleged that Mr. Holtzclaw followed her in his patrol car onto a street where she said he let her drop off her car before raping her, even though the AVL location data shows his patrol car never went on that street (Tr. 2925, 2934).

Ms. C6 was a multiple-time convicted felon (Tr. 3001) who used crack cocaine and marijuana (Tr. 3007) and said her assailant was a black man shorter than her own height of 5'11" (Tr. 2999) who raped her for "about five to ten minutes" at a public park containing an abandoned school (Tr. 3007). Yet Mr. Holtzclaw is Japanese American, has pale skin, and is over

6 feet tall. The AVL data showed that Mr. Holtzclaw's patrol car could only have been motionless in the park for less than four minutes (Tr. 3100), some of which was transit time because the patrol car was moving at time 1:14:28 (Tr. 3096) and then was already in motion again at 1:18:17 (Tr. 3099).

Ms. C7, a user of crack cocaine and marijuana (Tr. 3401), was under the influence of alcohol when Mr. Holtzclaw stopped her (Tr. 3356). She had a history of prison time and lying to police, and even caused a warrant to be issued for her underaged daughter's arrest by falsely using her daughter's name as her own. (Tr. 3406) Ms. C7's preliminary hearing testimony that Mr. Holtzclaw had ejaculated changed during trial to her stating that she didn't know. (Tr. 3404)

Finally, Ms. C8 smoked crack on a regular basis (Tr. 3521), was convicted of seven felonies (Tr. 3525), and gave conflicting testimony (Tr. 3523-26).

The DNA evidence in Mr. Holtzclaw's trial was also likely to be overvalued by the jury because the patrol car AVL data was weak circumstantial evidence that corroborated only that Mr. Holtzclaw had stopped and, at times, transported the complainants, which was unsurprising because the detectives used his own police records and radio calls to find 10 out of 13 women. While the AVL data often matched the complainants' accounts, it failed to corroborate fully the testimony of Ms. C5, Ms. C6, and Ms. C9. (Tr. 2925, 2934, 3100, 3239, 3288) Furthermore, the AVL data matches and discrepancies compared to details of complainants' memories had little significance because the AVL system experienced glitches (Tr. 2743), generated different data points every time AVL data was printed for a particular path (Tr. 2939), and provided patrol car location data that was only accurate to within 1,200 feet, the length of 3 football fields (Tr. 914).

3. Actual juror comments reveal the prejudicial impact of the DNA evidence.

The prejudicial impact of the DNA evidence in Mr. Holtzclaw's trial is shown by the comments of the two jurors who spoke to the press in post-trial interviews. Both expressed that the DNA evidence swayed the jury toward guilty verdicts.

Juror Ron Hill said in a news interview that "the DNA evidence was very crucial." KOKO 5 News, *Only on KOCO 5: Juror Speaks about Daniel Holtzclaw Trial*, YOUTUBE (Dec. 18, 2015), https://www.youtube.com/watch?v=XzOK3xZQqxQ.

Similarly, as reported by the press, "At first, [juror Daniel] Speaks said, a number of jurors were ready to set Holtzclaw free because they didn't believe some of Holtzclaw's accusers. 'There was some jurors that – due to that fact [of] who these victims were – had a hard time believing them,' Speaks said. Speaks says that it was DNA evidence on the inside of Holtzclaw's pants and testimony involving a 17-year-old victim that helped get the deliberations moving." Susan Welsh *et al.*, *How the Daniel Holtzclaw Jury Decided to Send the Ex-Oklahoma City Police Officer to Prison for 263 Years*, ABC News (May 20, 2016), http://abcnews.go.com/US/daniel-holtzclaw-jury-decided-send-oklahoma-city-police/story?id=38549442.

Juror Daniel Speaks also revealed to *Crime Watch Daily* that he believed the DNA had transferred in vaginal fluid because the jurors were told this during the trial, demonstrating that the jury was misled by the prosecutor's false claim that the teenager's DNA transferred in vaginal fluid: "Well, I mean, I'm not a DNA expert. [Shrugs shoulders.] They told us it was DNA from the vaginal fluid from a 17-year-old. The DNA people are pretty boring to be honest with you." *Crime Watch Daily Investigates the Case of Daniel Holtzclaw* (Telepictures Productions television broadcast Apr. 28, 2017), https://www.youtube.com/watch?v=JEt32Z_kz6o.

B. DNA Analysis Errors and Misrepresentations are Especially Harmful Because Jurors Weigh DNA Evidence Heavily.

When forensic analysts and prosecutors misuse forensic evidence, and particularly DNA evidence, this misuse hinders the major function of the trial process, which is to seek the truth and enable jurors to determine the facts in the case. *See* Aronson & McMurtrie at 1458 (explaining that DNA evidence must be "presented in a fair and evenhanded manner that does not embellish or exaggerate its true worth," and prosecutors must not "misuse or misrepresent […] forensic DNA evidence in order to obtain a conviction," because "there is a danger that the jury will be unduly swayed by the scientific nature of the evidence and consider it infallible proof of the accused's guilt"); *see also McCarty v. State*, 1988 OK CR 271, 765 P.2d 1215, 1219 (reversing a death penalty conviction because it was secured on the basis of false testimony by a forensic chemist whose "so-called expert opinion was actually a personal opinion beyond the scope of present scientific capabilities").

Because of the widespread belief that DNA evidence is reliable, "prosecutorial misconduct related to DNA evidence cannot be tolerated." Boies at 405. Misrepresented DNA evidence is especially harmful and should rarely receive harmless error review because DNA evidence has a major impact on the verdict. *See id.* at 405.

Courts repeatedly have found a prosecutor's misrepresentation of forensic DNA evidence to be reversible error. *See*, *e.g.*, *Duncan*, 322 S.W.3d at 85, 91-93 (reversing a conviction because the prosecutor overstated the significance of a DNA match and suggested the evidence was more powerful than it was during cross-examination and closing argument, rendering the trial unfair "given the immense weight jurors are apt to accord DNA evidence"); *Whack*, 73 A.3d at 188 (ordering a new trial because a prosecutor's error in overstating the importance of DNA

evidence "must be considered within the larger context" where jurors place "a great deal of weight on the reliability and accuracy of DNA evidence," which can be highly technical and confusing in a way that could unduly affect the outcome of a trial and therefore must be described with extra care); and *People v. Wright*, 25 N.Y.3d 769, 771, 37 N.E.3d 1127, 1128, 16 N.Y.S.3d 485, 486 (2015) (reversing a conviction where prosecutorial misconduct occurred during the closing argument and "defense counsel failed to object, time and again, when the prosecutor repeatedly misrepresented to the jury critical DNA evidence as proof of defendant's guilt, in contradiction of the People's expert testimony").

The DNA analysis errors that misled the jury in Mr. Holtzclaw's trial were highly prejudicial because they encouraged jurors to dismiss as unlikely the explanation of non-intimate DNA indirect transfer, and to give more credence to the allegations not just of Ms. C1, but also of the other women even though they had credibility issues and no forensic evidence supporting the allegations, as noted in Mr. Holtzclaw's brief (p. 47). *See* Boies at 424 ("[E]rrors may give support to other less reliable evidence making the other evidence seem more reliable.").

If the prosecution in Mr. Holtzclaw's trial had not misled the jury by misrepresenting the probative value of the DNA evidence from the fly of the uniform pants, the trial outcome would likely have been different because the jury's verdict rested heavily on the DNA evidence. *See* Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1, 63-65 (2009) (explaining that miscarriages of justice caused by mischaracterized DNA evidence were often due to prosecutorial errors, such as flawed DNA analysis and invalid testimony that misrepresented the DNA evidence or exaggerated the strength and importance of ambiguous, questionable DNA results); *see also* Findlay at 27.

C. The Misinterpretations and Incorrect Arguments Concerning the DNA Analysis were Harmful in Light of All the Evidence because the State Built a Biased Investigation upon the Foundation of the Mischaracterized DNA Evidence.

The prosecution's forensic science omissions and inaccuracies in Mr. Holtzclaw's case, and defense counsel's ineffectiveness at exposing and correcting them, were harmful in and of themselves, compounding each other and causing the DNA evidence to appear incriminating when it could be explained by non-intimate DNA indirect transfer. Yet the incorrect conclusions and arguments about the DNA evidence also impacted the entire trial and were far from harmless in light of all the circumstantial evidence because most of the evidence in the case was obtained through a biased investigational process founded upon the forensic science errors, which inspired detectives to use leading interview techniques to solicit many of the complainants' allegations. *See* Kassin *et al.* at 50 (the impacts of forensic confirmation bias).

The State's investigation of Mr. Holtzclaw was driven by the OCPD forensic analyst's unscientific advocacy for the presence of vaginal fluid as the explanation for the discovery of DNA matching Ms. C1's profile. The forensic analyst's unscientific opinions are expressed concisely by the State of Oklahoma itself in its witness list provided on Oct. 5, 2014, which describes her proposed testimony as follows: she "will opine for [C1's] DNA to be transferred to the pants, it most likely was contained in some type of body fluid - including vaginal secretions or saliva," and she "will express opinions that def.'s assertion that [C1's] DNA was found inside his pants as a result of contact DNA transfer is not reasonable, and perhaps not even possible - in support of this conclusion and opinion, she will testify that def.'s own DNA was not even found on his pants." (O.R. 240)

The OCPD forensic analyst's forensic science inaccuracies and incorrect testimony appear to have arisen from, or contributed to, her pro-prosecution bias that is clearly demonstrated by her testimony that "unfortunately in this case" Mr. Holtzclaw's DNA was not found in Ms. C2's SANE kit. (Tr. 4038) Such emotional bias has the potential to create cognitive bias, which refers to ways in which factors unrelated to a decision-making task can shape perceptions and judgments, affecting the reliability of conclusions. *See* PCAST Report at 31 (cognitive bias). When forensic experts are affected by cognitive bias, it is especially harmful because juries and judges trust them to provide impartial, objective scientific truth. *See* Dror *et al.* at 8.

Cognitive bias is an important cause of DNA analysis mistakes and leads to the very sort of subjective, pro-prosecution errors that appear to have occurred in Mr. Holtzclaw's case during DNA testing, DNA mixture interpretation, and testimony. *See id.* Examples of the forensic analyst's cognitive bias are that she overlooked the male DNA in items #17Q3 and #17Q4, and she subjectively and incorrectly excluded Mr. Holtzclaw as a contributor to all four DNA mixtures. *See* Itiel E. Dror & Greg Hampikian, *Subjectivity and Bias in Forensic DNA Mixture Interpretation*, 51 SCIENCE & JUSTICE 204, 205 (2011) ("DNA mixture interpretation has subjective elements and may be susceptible to bias and other contextual influences.").

These pro-prosecution errors made the DNA analysis results appear consistent with the forensic analyst's opinion that an absence of Mr. Holtzclaw's DNA meant it was "a very good possibility" that Ms. C1's DNA transferred in her vaginal fluid. (Tr. 4072-73); *see also* William C. Thompson, *Forensic DNA Evidence – The Myth of Infallibility*, *in* GENETIC EXPLANATIONS: SENSE AND NONSENSE 227, 238 (Sheldon Krimsky & Jeremy Gruber eds., 2013) ("The most

common form of misconduct in DNA testing is shading of scientific findings to make them more coherent or more consistent with what the analyst believes is true.").

The State then assumed that only sexual contact would transfer a woman's DNA to the fly of Mr. Holtzclaw's uniform pants, without considering the possibility of non-intimate DNA transfer or DNA contamination of the fly of the uniform pants. This is shown when the prosecutor told the trial judge at a Motion Hearing on Oct. 2, 2014, before Ms. C1 had been identified as a match, that it was an "undeniable fact" that "there is at least one more woman out there, because we have her DNA, that he has had sexual contact with. And we still don't know who she is or where she is." (10/2/14 Motion Hearing Tr. 62)

Finally, the detectives assumed that the DNA evidence was incriminating, as shown by the female detective's testimony that the unknown female profile was significant because the detective thus "knew we had another female out there," someone Mr. Holtzclaw "hadn't told us about," implying that Mr. Holtzclaw had withheld information. (Tr. 1081)

The hunt for the unidentified female then propelled the investigation. (Tr. 423-24, 3112-13, 3471) To be clear, searching for the female who matched the DNA profile in the mixtures obtained from the uniform pants was not the error. The State's investigational error was to assume that only sexual contact could have resulted in the DNA evidence, and that female DNA on the fly of the uniform pants was incriminating; to assume, as the lieutenant did, that African American women with warrants and criminal histories were targets, based on two complainants Ms. C2 and Ms. C9, the former lacking warrants and convictions (Tr. 2284, 2385-87); and to allow flawed assumptions to cause detectives to use leading interview methods when soliciting testimony from the chosen women, telling them that police had "received a tip" that the women

were "possibly sexually assaulted by an Oklahoma City police officer" (Tr. 1975, 2218, 2322-24, 2999, 3517-18), and encouraging interviewees to help catch the "really bad guy," the Appellant, because police had a long list of victims (Tr. 2250, 2273).

Investigators in Mr. Holtzclaw's case appear to have succumbed to a type of cognitive bias called confirmation bias, which is the tendency to search for and interpret evidence in ways that confirm preexisting expectations or beliefs, while failing to identify mistakes, and missing or ignoring other important facts that contradict their hypothesis. *See* Barbara O'Brien, *Prime Suspect: An Examination of Factors that Aggravate and Counteract Confirmation Bias in Criminal Investigations*, 15 PSYCHOLOGY, PUBLIC POLICY, AND LAW 315, 316 (2009).

We are concerned that the investigators developed tunnel vision, starting with an assumption of guilt founded upon forensic science errors without considering other hypotheses, and then homing in on their suspect, Mr. Holtzclaw, while missing or discounting exculpatory evidence such as the negative SANE kit test for Ms. C2 and lack of visible staining on the fly of the uniform pants, and "working backwards from the assumption of guilt and literally pulling together an account of events that was based upon pure speculation." Gill at 13; *see also* Dror *et al.* at 9; BUTLER at 46 (observer bias in forensic analyses); SAVINO & TURVEY at 519 ("[M]any law enforcement investigators work backward: they arrest suspects first […] and then conduct biased investigations that are geared primarily at building a case against that suspect," resulting in "missed suspects and evidence."); *id.* at 120-121, 152 (the danger of preconceived theories).

The bias of the sex crimes detectives is revealed in their testimony as they repeatedly dismissed the discrepancies between complainants' allegations and the facts. The male detective left out of his police interview report that Ms. C12 answered five times that no officer had been

inappropriate with her. (Tr. 4233) When Ms. C6 testified that her assailant was a black male shorter than herself (Tr. 3013), the female detective said, in response to whether this discrepancy worried her, that "there's no lights out there at the school" (Tr. 3087) even though it would be expected that Ms. C6 could discern whether or not Mr. Holtzclaw was black because she testified she could read the words on Mr. Holtzclaw's computer screen while he was running her for wants and warrants as she sat in the back seat of the patrol car (Tr. 3012-13). When Ms. C5 testified that Mr. Holtzclaw stopped his vehicle and picked her up on 24th Street, although the AVL location data shows his patrol car never went on that street, the female detective explained this discrepancy by saying, "Her memory just wasn't correct on him driving down 24th." (Tr. 2925, 2934) In contrast, when Mr. Holtzclaw did not log his stop with Ms. C5 "correctly" on his handwritten activity card, the detective testified, "I feel this was being deceptive," (Tr. 2909) even though Mr. Holtzclaw had called dispatch to notify them of the traffic stop (Tr. 2902).

We are concerned that Mr. Holtzclaw's case is an example of how the forensic confirmation bias "can corrupt the conclusions and testimony of forensic examiners," and then "these conclusions, once corrupted, can have grave consequences – influencing other lines of evidence" such that the forensic science conclusions appear to corroborate the other forms of evidence. Kassin *et al.* at 50; *see also* Dror *et al.* at 10 (explaining that cognitive contamination between different, ostensibly independent types of evidence can cause a "bias snowball effect" where the strength of biasing influences grows "as more evidence is exposed to the bias and in turn exposes others to bias"). These "biased sources of information" are then "presented to judges, juries, and appeal courts, which heavily rely on forensic science evidence in their decision-making." Kassin *et al*. at 50.

This problem of the chain reaction of confirmation bias infiltrating an entire investigation has been observed to have relevance at the appellate level, where courts should not make the mistake of deeming flawed evidence in a trial to be harmless in light of all of the evidence that appears to support the conviction, when in fact that other evidence was not independent of the flawed evidence, and actually arose from or produced it. *Id.*

The forensic science errors in Mr. Holtzclaw's trial were harmful because they formed the flawed foundation of the case built against Mr. Holtzclaw and created an unfair trial substantially swayed by error that led to his convictions. *See United States v. Bagley*, 473 U.S. 667, 679-680 n.9 (1985) (citations omitted) (reiterating that an error is not harmless if there is a reasonable likelihood the error may have affected the jury's decision to convict the defendant).

CONCLUSION

We believe that Mr. Holtzclaw was deprived of his due process right to a fair trial because the State misused DNA evidence – a powerful form of forensic evidence – and trial defense counsel did not correct crucial forensic science misrepresentations and omissions, such that the DNA evidence at the heart of the trial and lacking probative value was extremely prejudicial, corrupting the investigation of Mr. Holtzclaw and impacting the verdict. We believe that Mr. Holtzclaw's conviction should be overturned and he should be given a new trial.

DATED this 25th day of July, 2017.

Respectfully,

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