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**United States Court of Appeals**  
**Tenth Circuit**

**PUBLISH**

**UNITED STATES COURT OF APPEALS**

**April 10, 2018**

**FOR THE TENTH CIRCUIT**

**Elisabeth A. Shumaker**  
**Clerk of Court**

SAMANTHA HALL,

Plaintiff - Appellant,

v.

No. 17-6086

CONOCO INC.;  
CONOCOPHILLIPS COMPANY;  
PHILLIPS 66 COMPANY,

Defendants - Appellees.

**Appeal from the United States District Court**  
**for the Western District of Oklahoma**  
**(D.C. No. 5:14-CV-00670-HE)**

Jason B. Aamodt of Indian & Environmental Law Group, PLLC, Tulsa, Oklahoma (Krystina E. Phillips, Dallas L.D. Strimple, of Indian & Environmental Law Group, PLLC, Tulsa, Oklahoma; Trae Gray, Ryan Ellis, of LandownerFirm, PLLC, Coalgate, Oklahoma; G. Steven Stidham of Levinson, Smith & Huffman, P.C., Tulsa, Oklahoma, with him on the briefs), for Plaintiff-Appellant.

Brett J. Young (Joy M. Soloway, Katherine D. Mackillop, Devin Wagner, with him on the brief), of Norton Rose Fulbright US LLP, Houston, Texas, for Defendants-Appellees.

Before **BACHARACH, MURPHY, and McHUGH**, Circuit Judges.

**BACHARACH**, Circuit Judge.

This appeal involves issues of causation and exclusion of expert testimony. These issues arose in a suit by Ms. Samantha Hall against Conoco Inc., ConocoPhillips Company, and Phillips 66 Company (collectively, “ConocoPhillips”) on theories of negligence, negligence per se, and strict liability.

Ms. Hall was diagnosed with leukemia, and she attributes the disease to a ConocoPhillips refinery’s emissions of a chemical known as benzene. Liability turned largely on whether benzene emissions had caused Ms. Hall’s leukemia. On the issue of causation, the district court excluded testimony from two of Ms. Hall’s experts and granted summary judgment to ConocoPhillips. We affirm because

- the district court did not abuse its discretion in excluding the expert testimony and
- expert testimony was necessary to create a genuine issue of material fact on causation because of the length of time between the exposure to benzene and the onset of Ms. Hall’s disease.

## **I. Background**

As a child, Ms. Hall had lived near ConocoPhillips’s refinery in Ponca City, Oklahoma. Roughly two decades later, Ms. Hall developed a form of leukemia known as “Acute Myeloid Leukemia with Inversion 16.” This disease, according to Ms. Hall, resulted from her early exposure to the refinery’s emissions of benzene.

In district court, Ms. Hall tried to prove this link through three expert witnesses:

1. Dr. David Mitchell, an air modeler,
2. Dr. Steven Gore, an oncologist, and
3. Dr. Mary Calvey, an epidemiologist.

Dr. Mitchell created an air model to estimate benzene concentrations near where Ms. Hall had lived. Based on Dr. Mitchell's estimates, Dr. Gore

- calculated Ms. Hall's cumulative exposure to benzene and
- used this calculation to opine that benzene exposure had caused Ms. Hall's leukemia.

Dr. Calvey expressed a similar opinion.

ConocoPhillips moved for

- exclusion of opinion testimony by multiple expert witnesses, including Dr. Gore and Dr. Calvey and
- summary judgment on the issue of causation.

The district court granted the motion to exclude the expert testimony by Drs. Gore and Calvey. In the absence of their testimony, the court also granted summary judgment to ConocoPhillips, concluding that Ms. Hall had not presented sufficient evidence linking her disease to benzene exposure.

## **II. Exclusion of Expert Testimony**

Ms. Hall challenges the district court's exclusion of expert testimony by Drs. Gore and Calvey. We reject this challenge.

**A. Standard of Review**

The district court has “wide latitude” in deciding whether to exclude expert testimony, and we review the manner in which the district court exercises this gatekeeping function for an abuse of discretion. *Bitler v. A.O. Smith Corp.*, 400 F.3d 1227, 1232 (10th Cir. 2005).

The district court’s exclusion of expert testimony is governed by federal law. *See Sims v. Great Am. Life Ins.*, 469 F.3d 870, 879 (10th Cir. 2006). Under Federal Rule of Evidence 702, a qualified expert witness may give opinion testimony if

- the expert’s scientific knowledge would help the fact-finder understand the evidence,
- “the testimony is based on sufficient facts or data,”
- “the testimony is the product of reliable principles and methods,” and
- “the expert has reliably applied the principles and methods to the facts of the case.”

Fed. R. Evid. 702.

Before expert testimony can be admitted, the district court must determine that the proposed testimony is reliable. *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579, 589 (1993). The district court’s assessment of reliability is reviewed for an abuse of discretion. *Goebel v. Denver & Rio Grande W. Ry.*, 346 F.3d 987, 990 (10th Cir. 2003). This review includes consideration of whether “the reasoning and methodology underlying the

expert’s opinion . . . is both scientifically valid and applicable to a particular set of facts.” *Id.* at 991.

**B. Dr. Gore’s Testimony**

Dr. Gore rendered a differential diagnosis on the cause of Ms. Hall’s leukemia. A differential diagnosis “rule[s] in all scientifically plausible causes of the injury and then rule[s] out the least plausible causes until only the most likely cause remain[s].” *Id.* at 990.

Dr. Gore’s first step was to rule in benzene, smoking, and idiopathic causes as potential causes of Ms. Hall’s leukemia.<sup>1</sup> Dr. Gore then ruled out smoking as a potential cause, leading him to conclude that benzene exposure had caused Ms. Hall’s leukemia. Dr. Gore did not expressly rule out the possibility of idiopathic causes.

The district court assumed that a differential diagnosis could provide a suitable methodology. But the district court regarded Dr. Gore’s differential diagnosis as unreliable based partly on his failure to justify ruling in benzene or ruling out “idiopathic causes” of Ms. Hall’s disease. *Hall v. ConocoPhillips*, 248 F. Supp. 3d 1177, 1190-91 (W.D. Okla. 2017) (quoting *Chapman v. Procter & Gamble Distrib.*, 766 F.3d 1296, 1311 (11th Cir. 2014)). This reasoning fell within the district court’s discretion.

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<sup>1</sup> Dr. Gore and other experts explained that an “idiopathic” disease is a disease in which the cause is unknown.

## **1. Ruling In Benzene**

To use a differential diagnosis, Dr. Gore needed to consider whether he could rule in benzene as a potential cause of Ms. Hall's disease. We may assume, as the district court did, that benzene emissions can cause Acute Myeloid Leukemia with Inverse 16. With this assumption, however, Ms. Hall would still have needed to show that the benzene emissions actually caused her disease. For this showing, Ms. Hall relied on Dr. Gore's quantification of the exposure to benzene.

To quantify the exposure, Dr. Gore used the work of another expert witness, Dr. Mitchell, who had constructed an air model to estimate the highest hourly average concentration of benzene. With this estimate, Dr. Gore quantified the cumulative exposure to benzene based on how long Ms. Hall had lived near the refinery.<sup>2</sup> The result led Dr. Gore to rule in benzene as a potential cause of Ms. Hall's leukemia.

The district court found two flaws in this methodology:

1. Dr. Gore could not reliably use the highest hourly average-emission level to calculate Ms. Hall's cumulative exposure to benzene.

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<sup>2</sup> Dr. Gore later upped his estimate of Ms. Hall's total exposure based on new air modeling by Dr. Mitchell, which in turn had been based on new information. The supplemental estimates of Drs. Mitchell and Gore were excluded in district court based on a failure to timely disclose these estimates. The parties dispute the correctness of this ruling, but we need not reach the issue because we affirm the exclusion of Dr. Gore's opinion based on flaws in his methodology. The newly acquired information did not affect these flaws.

2. Dr. Gore's calculation was based on mistakes involving the extent of Ms. Hall's exposure to benzene.

In finding these flaws, the district court acted within its discretion.

**a. The Choice of the Highest Hourly Average-Emission Level**

Dr. Gore estimated Ms. Hall's cumulative exposure by taking one of Dr. Mitchell's figures (the highest hourly average-emission level).

ConocoPhillips questions the use of this figure, pointing out that Dr. Gore could have used other figures from Dr. Mitchell's air model.

In this model, Dr. Mitchell had estimated benzene emissions over an extended time period. This estimate included the highest hourly average concentration of benzene while Ms. Hall lived near the refinery. Dr. Mitchell took this figure and instructed Dr. Gore to use it for his own calculation.

But Dr. Mitchell admitted that he was not qualified to decide which figure to use in assessing the impact of benzene emissions on human health:

- Q. You are not qualified when it comes to analyzing what value—acute, chronic, subchronic—is more relevant for assessing human health risk for benzene or any other chemical. You are not qualified to offer that opinion.
- A. I fully agree with that. I'm an air modeler and I'm a meteorologist.

...

Q. And you don't know which one of those matters most or matters at all for assessing whether or not Samantha Hall developed [acute myeloid leukemia] from benzene?

A. Counselor, that's out of my expertise. I'm not—I'm an air modeler and a meteorologist.

Appellant's App'x at 4944-45. Dr. Mitchell conceded that selection of the concentration level was best left to an oncologist like Dr. Gore.<sup>3</sup> In turn, Dr. Gore acknowledged that he had not independently chosen which figure to use. Instead, he had admittedly relied on Dr. Mitchell's expertise to select the pertinent figure.

Dr. Gore testified that he had called Dr. Mitchell, who provided assurance that the highest hourly average-emission level was the metric used in the industry. Appellant's App'x at 5162. The district court could reasonably consider this assurance an inadequate safeguard of reliability. *See Mitchell v. Gencorp Inc.*, 165 F.3d 778, 781 (10th Cir. 1999) (“The expert's assurance that the methodology and supporting data is reliable will not suffice.”).

Without an adequate safeguard of reliability, the district court could reasonably conclude that neither Dr. Gore nor Dr. Mitchell could defend the use of the highest hourly average-emission level. Both expert witnesses

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<sup>3</sup> Dr. Mitchell noted that he was confident in his choice of the highest hourly average because this was the figure that other expert witnesses had always requested. But requests from other expert witnesses do not obviate the need for someone with expertise to select the appropriate concentration level for Dr. Gore's calculation.



had seemingly disclaimed any responsibility for picking this figure: Dr. Mitchell had regarded Dr. Gore as the expert and Dr. Gore had regarded Dr. Mitchell as the expert, leaving no one qualified to choose which concentration level to use.

This circular loop stirred broader concern over the entirety of Dr. Gore's calculation. That calculation was designed to estimate Ms. Hall's cumulative exposure to benzene. If Dr. Gore had calculated the cumulative exposure based on an incorrect figure, the court could reasonably question the decision to rule in benzene as a potential cause.<sup>4</sup> As a result, we conclude that the district court acted within its discretion in questioning the reliability of Dr. Gore's decision to use the highest hourly average-emission level.

**b. Dr. Gore's Errors and Inconsistencies Regarding the Extent of Ms. Hall's Exposure to Benzene**

The district court also identified three of Dr. Gore's errors and inconsistencies about the extent of Ms. Hall's exposure to benzene.

First, Dr. Gore assumed that Ms. Hall had lived near the refinery for eight years. But Dr. Gore was mistaken; Ms. Hall had lived near the refinery for only about four years. As Dr. Gore acknowledged, this error

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<sup>4</sup> Ms. Hall argues that medical doctors can rely on expert air modelers. Ms. Hall is correct, and the district court never suggested otherwise. The problem was that no one had justified the selection of the figure that was used in calculating Ms. Hall's cumulative exposure to benzene.

meant that his estimate of the cumulative exposure was roughly double what it should have been.

Second, Dr. Gore vacillated on his own methodology. He initially stated that he had calculated Ms. Hall's exposure by

- using the highest hourly average-emission level from Dr. Mitchell's model and
- assuming that Ms. Hall had been exposed to that level for one hour every day.

But in a later declaration, Dr. Gore stated that he had assumed exposure for 8 hours per day, 5 days per week, 50 weeks per year. At a hearing, Dr. Gore switched back, testifying that his declaration had been mistaken and that he had actually assumed only one hour of exposure per day.

Third, the district court found that Dr. Gore had been inconsistent about what he was calculating. He sometimes said that he was calculating Ms. Hall's exposure to benzene; other times, however, he stated that he was calculating exposure to volatile organic compounds. These inconsistencies mattered because benzene is only one of many volatile organic compounds.<sup>5</sup>

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<sup>5</sup> In his deposition, Dr. Gore estimated Ms. Hall's exposure to benzene as only 20% of her broader exposure to volatile organic compounds. But Dr. Gore later backtracked, stating that his initial calculation had been solely for benzene and had excluded other volatile organic compounds.

In light of these errors and inconsistencies, the district court could reasonably question the reliability of Dr. Gore's opinion ruling in benzene exposure as a potential cause.

## **2. Ruling Out Idiopathic Causes**

Even if benzene could be ruled in as a potential cause, Dr. Gore's differential diagnosis would have depended on his ability to rule out less plausible causes of Ms. Hall's disease. The district court concluded that Dr. Gore had failed to rule out idiopathic causes, and this conclusion fell within the district court's discretion.

The parties agreed that acute myeloid leukemia is frequently caused by idiopathic sources. For example, Ms. Hall presented expert testimony that 70-75% of cases of acute myeloid leukemia are idiopathic. And Dr. Gore agreed that acute myeloid leukemia is ordinarily idiopathic in origin. The resulting question is whether Dr. Gore needed to consider and rule out idiopathic causes. The district court answered "yes."

A differential diagnosis is designed to identify the most likely cause of a disease. *See Goebel v. Denver & Rio Grande W. Ry.*, 346 F.3d 987, 990-91 (10th Cir. 2003). An expert need not consider and rule out every conceivable cause. *See Bitler v. A.O. Smith Corp.*, 400 F.3d 1227, 1238 n.6 (10th Cir. 2005); accord *Best v. Lowe's Home Ctrs.*, 563 F.3d 171, 181 (6th Cir. 2009) ("[D]octors need not rule out every conceivable cause in order for their differential-diagnosis-based opinions to be admissible.").

But the expert must still consider all *plausible* causes and rule out the less plausible ones until only the most likely cause remains. *See Glastetter v. Novartis Pharm.*, 252 F.3d 986, 989 (8th Cir. 2001); *see also Hollander v. Sandoz Pharm.*, 289 F.3d 1193, 1211-12 (10th Cir. 2002) (noting that a reliable differential diagnosis eliminates “all other possible causes of the victims’ condition . . . leaving only the toxic substance as the cause” (quoting *Turner v. Iowa Fire Equip.*, 229 F.3d 1202, 1209 (8th Cir. 2000))).

Dr. Gore did not rule out the possibility of an idiopathic cause for Ms. Hall’s acute myeloid leukemia. This omission concerned the district court because the evidence had pointed to idiopathic causes in most cases of acute myeloid leukemia, and the district court could reasonably view the failure to rule out idiopathic causes as a fatal error tainting the differential diagnosis. *See Milward v. Rust-Oleum Corp.*, 820 F.3d 469, 476 (1st Cir. 2016) (upholding exclusion of expert testimony based on a differential diagnosis, reasoning that it was unreliable to link benzene to acute promyelocytic leukemia in part because the disease has an extraordinary number of idiopathic cases); *see also Chapman v. Procter & Gamble Distrib.*, 766 F.3d 1296, 1311 (11th Cir. 2014) (holding that a failure to consider idiopathic causes rendered the differential diagnosis unreliable); *Tamraz v. Lincoln Elec.*, 620 F.3d 665, 675 (6th Cir. 2010) (holding that expert testimony regarding causation of a given disease was inadmissible

because “the vast majority of . . . cases” involve “unknown (idiopathic) causation,” “making it impossible to ignore and rule out”); *accord Blanchard v. Goodyear Tire & Rubber Co.*, 30 A.3d 1271, 1275-76 (Vt. 2011) (stating that the presence of a known risk factor is not sufficient to rule out idiopathic origin, particularly when most incidents of the disease lacked a known cause).

Ms. Hall responds with two arguments:

1. The district court misunderstood the concept of “idiopathic” causes.
2. The Tenth Circuit does not require differential diagnoses to rule out idiopathic causes.

We reject both arguments.

First, Ms. Hall argues that the district court misunderstood the term “idiopathic.” She characterizes “idiopathic” as a diagnosis by exclusion: only if all known factors are ruled out, leaving no known plausible factors, can the leukemia be considered idiopathic. Under this view, it is illogical to ask Dr. Gore to “rule out” idiopathic causes because a disease can be considered idiopathic only if all identifiable causes have been ruled out.

Based on this definition of “idiopathic,” Ms. Hall regards the district court’s reasoning as faulty. To Ms. Hall, Dr. Gore properly ruled in all known risk factors and ruled out the implausible ones until he was left only with benzene. Because benzene remained a plausible cause, the term “idiopathic” would not fit.

But the district court could reasonably take a different approach when analyzing “idiopathic” causes. One can regard “idiopathic” causes as recognition of the medical community’s inability to identify all of the causes of a disease. *See Tamraz v. Lincoln Elec.*, 620 F.3d 665, 668 (6th Cir. 2010) (stating that the term “idiopathic” is “another way of saying the medical community does not know why a given individual has the disease”); *Huss v. Gayden*, 571 F.3d 442, 459 (5th Cir. 2009) (indicating that a condition is “idiopathic” when “the medical community has a poor understanding of what causes it”); *see also Vacuum Depositing, Inc. v. Dever*, 285 S.W.3d 730, 733 (Ky. 2009) (“In common parlance, the term ‘idiopathic’ means ‘arising spontaneously or from an obscure or unknown cause.’” (footnote omitted)).

Because idiopathy accounts for more than half of the cases of acute myeloid leukemia, a differential diagnosis could be considered inherently unreliable here. *See Tamraz*, 620 F.3d at 675 (“[U]nknown (idiopathic) causation . . . currently accounts for the vast majority of Parkinson’s Disease cases, making it impossible to ignore and difficult to rule out.”); *Bland v. Verizon Wireless, (VAW)*, 538 F.3d 893, 897 (8th Cir. 2008) (“Where the cause of the condition is unknown in the majority of cases, [the expert witness] cannot properly conclude, based upon a differential diagnosis, [the plaintiff’s] exposure to freon was ‘the most probable cause’ of [the plaintiff’s] exercise-induced asthma.”); *see also* Restatement

(Third) of Torts: Liab. for Physical and Emotional Harm § 28 cmt. c(4) (Am. Law. Inst. 2010) (“When the causes of a disease are largely unknown, . . . [a differential diagnosis] is of little assistance.”). Given the predominance of idiopathic causes, we conclude that the district court had the discretion to consider Dr. Gore’s differential diagnosis unreliable.

Second, Ms. Hall contends that the Tenth Circuit does not require experts to rule out idiopathic causes in conducting a differential diagnosis. For this contention, Ms. Hall relies on *Bitler v. A.O. Smith Corp.*, 400 F.3d 1227 (10th Cir. 2005). Ms. Hall has misinterpreted *Bitler*. There we observed that an expert need not ““categorically exclude each and every possible alternative cause.”” *Bitler*, 400 F.3d at 1238 n.6 (quoting Stephen A. Saltzburg et al., *Federal Rules of Evidence Manual* 702-33 (8th ed. 2002)). This observation does not preclude a district court from questioning the reliability of a differential diagnosis when the cause of a disease is unknown most of the time.

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The district court could justifiably regard Dr. Gore’s differential diagnosis as unreliable because of his failure to (1) justify ruling in benzene or (2) rule out idiopathic causes. Thus, the district court did not abuse its discretion in excluding Dr. Gore’s opinion based on his differential diagnosis.

### **C. Dr. Calvey's Testimony**

The district court also excluded Dr. Calvey's opinion testimony linking benzene to Ms. Hall's disease. Like Dr. Gore, Dr. Calvey conducted a differential diagnosis and opined that benzene had caused Ms. Hall's leukemia. This opinion was excluded in part because Dr. Calvey had not "adequately address[ed] the issue of exposure." *Hall v. ConocoPhillips*, 248 F. Supp. 3d 1177, 1193 (W.D. Okla. 2017). Ms. Hall does not challenge this rationale, foreclosing reversal of the exclusion of Dr. Calvey's testimony. *See Bones v. Honeywell Int'l*, 366 F.3d 869, 877 (10th Cir. 2004) (affirming a grant of summary judgment because the appellant failed to appeal an alternative basis for the ruling).

### **III. Summary Judgment**

Ms. Hall challenges not only the exclusion of expert testimony but also the grant of summary judgment to ConocoPhillips. The district court concluded that without the expert testimony by Dr. Gore and Dr. Calvey, Ms. Hall lacked the required evidence linking her disease to benzene emissions. Ms. Hall challenges this conclusion, arguing that the circumstantial evidence was enough to avoid summary judgment.<sup>6</sup>

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<sup>6</sup> Both parties focus on Oklahoma law. Although federal law governs whether Ms. Hall presented sufficient evidence of causation to defeat summary judgment, state law governs "what theories of causation are permissible and the general means permitted to establish causation." *Tingey v. Radionics*, 193 F. App'x 747, 760 (10th Cir. 2006)



We engage in de novo review of the grant of summary judgment. *United States v. Turley*, 878 F.3d 953, 956 (10th Cir. 2017). Summary judgment is appropriate only if the movant has shown

- the absence of a genuine issue of material fact and
- the movant's entitlement to judgment as a matter of law.

*Gutteridge v. Oklahoma*, 878 F.3d 1233, 1238 (10th Cir. 2018).

For causation, Ms. Hall points to circumstantial evidence such as the presence of hydrocarbon leaks and odors in her neighborhood, groundwater contamination, a high benzene reading near her residence, and estimates by the Environmental Protection Agency showing increased risk from the refinery. This circumstantial evidence fails to create a genuine issue of material fact on causation because of the need for

- expert testimony on the link between her disease and benzene exposure and
- quantification of Ms. Hall's exposure to benzene.

**A. The Necessity of Expert Testimony**

Ms. Hall's circumstantial evidence does not create a genuine issue of material fact on causation because of the length of time between her exposure to benzene emissions and the onset of her disease.

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(unpublished); see *Wackman v. Rubsamen*, 602 F.3d 391, 400 (5th Cir. 2010). The resolution of Ms. Hall's claim depends on whether the type of evidence submitted constituted a permissible means of proving causation. Thus, we apply state law. See *Tingey*, 193 F. App'x at 760, 764; *Wackman*, 602 F.3d at 400 & n.2.

Oklahoma law generally requires expert testimony for complex issues of medical causation. *See, e.g., Christian v. Gray*, 65 P.3d 591, 601-02 (Okla. 2003) (“When an injury is of a nature requiring a skilled and professional person to determine cause and the extent thereof, the scientific question presented must necessarily be determined by testimony of skilled and professional persons.”); *Ruland v. Zenith Constr.*, 283 P.2d 540, 541 (Okla. 1955) (noting that the cause of an illness “is a matter of medical science to be established by expert testimony”).

An exception exists “where the common knowledge or experience of laymen is extensive enough to recognize or infer negligence from the facts . . . with reasonable certainty.” *Boxberger v. Martin*, 552 P.2d 370, 373 (Okla. 1976). But the district court could reasonably conclude that the long-term carcinogenic effects of benzene exposure lie outside the ken of common experience, requiring expert testimony. *See Jones v. Ortho Pharm. Corp.*, 163 Cal. App. 396, 403 (1985) (stating that the etiology of cancer lies “beyond the experience of laymen and can only be explained through expert testimony”).

In light of the need for expert testimony on the effects of benzene exposure, Ms. Hall could not avoid summary judgment by relying solely on circumstantial evidence linking her disease to benzene emissions.

## **B. Quantification of Exposure to Benzene**

When causation involves a link between a disease and exposure to a toxin, the exposure must ordinarily be quantified. *See Mitchell v. Gencorp, Inc.*, 165 F.3d 778, 781 (10th Cir. 1999) (“Scientific knowledge of the harmful level of exposure to a chemical plus knowledge that plaintiff was exposed to such quantities are minimal facts necessary to sustain the plaintiff’s burden in a toxic court case.” (quoting *Allen v. Pa. Eng’g*, 102 F.3d 194, 199 (5th Cir. 1996))). Thus, Ms. Hall’s theory required not only expert testimony but also quantification of her exposure to benzene. *See Twyman v. GHK Corp.*, 93 P.3d 51, 59-60 (Okla. Civ. App. 2004) (faulting an expert for his inability to identify the presence of a chemical at sufficient levels to have caused the injury).

Ms. Hall disputes the need to quantify her exposure. For this argument, Ms. Hall relies on *Christian v. Gray*, 65 P.3d 591 (Okla. 2003). There the plaintiffs asserted that they had become sick from inhaling airborne chemicals at a circus. *Id.* at 594. The Oklahoma Supreme Court concluded that the plaintiffs had not needed to quantify their exposure to the airborne chemical, reasoning that

- this approach would “prevent many lawsuits based upon a single-event exposure, such as, for example, when a plaintiff brings an action and testifies of being enveloped by a great cloud of noxious gas from a calamitous event” and
- “evidence of instantaneous onset of injury following a certain occurrence and expert testimony that the injury could have

been caused by the occurrence’” is enough to survive summary judgment.

*Id.* at 606 (quoting *Martin v. Stratton*, 515 P.2d 1366, 1371 (Okla. 1973)).

In *Christian*, the court concluded that quantitative measurement is sometimes unnecessary when the plaintiff is exposed to an excessive amount of a chemical, followed quickly by the onset of symptoms. *See id.* Our case is far different. Ms. Hall alleges long-term exposure to benzene, causing leukemia decades later. Thus, the *Christian* exception has no bearing here.

\* \* \*

To avoid summary judgment on the issue of causation, Ms. Hall needed both expert testimony and quantification of her exposure to benzene. Without the proposed testimony by Dr. Gore and Dr. Calvey, Ms. Hall lacked both the required expert testimony and a way to quantify her exposure to benzene emissions. Accordingly, the district court did not err in granting summary judgment to ConocoPhillips on causation.

#### **IV. Conclusion**

We conclude that the district court did not err

- in excluding the testimony of Drs. Gore and Calvey and
- in concluding that ConocoPhillips was entitled to summary judgment on causation.

Therefore, we affirm.