

[Amorgianos v. Amtrak](#)

United States Court of Appeals for the Second Circuit
February 11, 2002, Argued ; August 28, 2002, Decided
Docket No. 01-7508

Reporter

303 F.3d 256 *; 2002 U.S. App. LEXIS 17792 **; 59 Fed. R. Serv. 3d (Callaghan) 639

NIKITAS AMORGIANOS and DONNA AMORGIANOS, Plaintiffs-Appellants, v. NATIONAL RAILROAD PASSENGER CORPORATION, d/b/a Amtrak, Defendant-Third-Party-Plaintiff-Appellee, ROMANO ENTERPRISES, Romano Enterprises of New York, Inc., AHERN PAINTING, Ahern Painting Contractors Inc., and DYNAMIC PAINTING, Dynamic Painting Corporation, Third-Party-Defendants.

Prior History: **[**1]** Plaintiffs-appellants Nikitas and Donna Amorgianos appeal from judgments of the United States District Court for the Eastern District of New York (Edward R. Korman, Chief District Judge and David G. Trager, District Judge), granting a motion for new trial in favor of defendant National Railroad Passenger Corporation ("Amtrak"), excluding the testimony of plaintiffs' experts, and granting summary judgment in favor of Amtrak. We conclude that the district court did not abuse its discretion in granting the motion for new trial or in excluding the expert testimony, nor did the district court err in granting summary judgment for defendant.

[Amorgianos v. AMTRAK, 137 F. Supp. 2d 147, 2001 U.S. Dist. LEXIS 3499 \(E.D.N.Y. 2001\)](#)

Disposition: Affirmed.

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Judges: Before: WALKER, Chief Judge, SACK and B.D. PARKER, JR., Circuit Judges.

Opinion by: JOHN M. WALKER, JR.

Opinion

[*259] JOHN M. WALKER, JR., Chief Judge:

This case requires us to elaborate on the nature of the district court's role as the gatekeeper for scientific and technical testimony under [Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L. Ed. 2d 469, 113 S. Ct. 2786 \(1993\)](#). **[**2]** The Supreme Court's now-familiar Daubert ruling set forth the standards for the admissibility of expert scientific and technical testimony, providing that the district judge is to ensure that such testimony rests on a reliable foundation and is relevant to the case before the court. [Id. at 597](#). The question of how the district court is to perform this critical function is central to this appeal.

In June of 1998, a jury found in favor of plaintiffs Nikitas and Donna Amorgianos on a number of claims arising out of work-related injuries that Nikitas Amorgianos claimed to have suffered while engaged in a bridge painting project at a job site overseen by defendant National Railroad Passenger Corporation ("Amtrak"). Concluding that the jury verdict was against the weight of the evidence, the United States District Court for the Eastern District of New York (Edward R. Korman, Chief District Judge) granted defendant Amtrak's motion for new trial. The case was then reassigned to Judge David G. Trager and defendant filed a Daubert motion to preclude plaintiffs' experts from

testifying at the second trial. Judge Trager granted defendant's motion in a lengthy opinion, **[**3]** [Amorgianos v. National Railroad Passenger Corp., 137 F. Supp. 2d 147 \(E.D.N.Y. 2001\)](#), and thereafter granted summary judgment in favor of Amtrak.

On appeal, plaintiffs argue that the district court abused its discretion in granting defendant's motion for new trial and thereafter **[*260]** by excluding plaintiffs' experts. They also contend that the district court erred in ultimately granting summary judgment. Finding no abuse of discretion or error in the district court's rulings, we affirm.

BACKGROUND

I. Plaintiffs' Claims

Plaintiff Nikitas Amorgianos ("Amorgianos") seeks to recover damages for injuries he allegedly sustained as a result of toxic chemical exposure that occurred while he was painting a bridge at a job site overseen by defendant Amtrak. Amorgianos, who fell ill on August 28, 1995 while spray painting, alleges that his inhalation of and dermal exposure to toxic chemicals, and in particular to xylene, an organic solvent contained in paints, thinners, and primers used at the job site, caused him to suffer a variety of ailments. Specifically, he contends that his exposure to xylene resulted in "permanently disabling central nervous system dysfunctions, such **[**4]** as memory loss and cognitive deficits, and peripheral polyneuropathy, a neurological condition involving the loss of sensation and motor control in the extremities." Plaintiff Donna Amorgianos, Amorgianos's wife, claims loss of consortium and services.

II. Procedural History

In April 1996, plaintiffs filed a complaint in state court that was later removed to the United States District Court for the Eastern District of New York. Thereafter, in June of 1998, the case proceeded to a jury trial before Judge Korman, resulting in a verdict in plaintiffs' favor. The jury awarded Amorgianos \$ 160,000 for loss of past earnings, \$ 340,000 for past pain and suffering, \$ 2.2 million for future pain and suffering, and \$ 572,000 for future lost earnings; it also awarded Mrs. Amorgianos \$ 60,000 for loss of consortium and services.

After trial, defendant Amtrak filed a motion for judgment as a matter of law or for a new trial, pursuant to [Rules 50](#) and [59 of the Federal Rules of Civil Procedure](#). Judge Korman denied Amtrak's motion for judgment as a matter of law but granted the motion for new trial upon concluding that the verdict was against the weight of the evidence. The case was then reassigned **[**5]** to Judge Trager.

In anticipation of a second trial, plaintiffs offered two experts who testified at the first trial, industrial hygienist Jack Caravanos and internist Dr. Jacqueline Moline, and one additional expert toxicologist, Dr. Jonathan S. Rutchik. Amtrak filed a Daubert motion to exclude the testimony of all three of plaintiffs' experts. By opinion, the district court granted the motion in part and denied it in part. [Amorgianos, 137 F. Supp. 2d 147](#).

In granting defendant's Daubert motion in part, the district court concluded that (a) Caravanos would not be permitted to testify regarding the concentration of xylene or other organic solvents to which Amorgianos was exposed because the methodology he used in calculating Amorgianos's exposure was unsound, [id. at 174-76](#); (b) none of plaintiffs' experts would be permitted to testify "on the issue of general causation with respect to Mr. Amorgianos's alleged chronic neurological conditions," because their opinions were unreliable, [id. at 191, 177-91](#); and (c) plaintiffs' experts' testimony as to the duration of Amorgianos's alleged exposure was beyond their areas of expertise, **[**6]** [id. at 176](#).

The district court also denied defendant's motion in part, holding that plaintiffs' experts could testify regarding Amorgianos's "alleged eye irritation, nausea, fever, and other acute health conditions **[*261]** in the two-to three-day period after he ceased work on August 28, 1995, provided plaintiffs produce admissible expert evidence" regarding the xylene concentration to which Amorgianos was exposed, [id. at 191](#); and that plaintiffs would be allowed to present otherwise admissible expert evidence based on the estimated duration of Amorgianos's exposure.

However, having excluded plaintiffs' proffered general causation testimony regarding the cause of Amorgianos's long-term neurological symptoms, the district court granted defendant leave to file a motion for summary judgment with respect to those claims and with respect to Mrs. Amorgianos's loss of consortium claims. *Id.* Finally, recognizing that the defects in Caravanos's expert opinion as to Amorgianos's xylene exposure level could be remedied if a more precise calculation method were applied, the district court granted plaintiffs leave to supplement the expert evidence. *Id.* In **[**7]** doing so, the district court advised plaintiffs that if they failed to supplement the record as indicated, defendant would be granted leave to file a motion for summary judgment with respect to all of Amorgianos's remaining claims. *Id.*

Plaintiffs failed to supplement the record and Amtrak's oral motion for summary judgment was granted with respect to all of plaintiffs' claims on March 30, 2001. This appeal followed.

On appeal, plaintiffs argue that the district court abused its discretion by granting defendant's motion for new trial and by excluding plaintiffs' experts under *Daubert*. Plaintiffs also contend that the district court erred in granting defendant's motion for summary judgment after excluding plaintiffs' experts. We address each of these arguments in turn.

DISCUSSION

I. Motion for New Trial

A. Standard of Review

This court reviews the grant of a new trial on the ground that the verdict was against the weight of the evidence for abuse of discretion. *Farrior v. Waterford Bd. of Educ.*, 277 F.3d 633, 634 (2d Cir.) (per curiam), cert. denied, 153 L. Ed. 2d 836, 122 S. Ct. 2661 (2002). Granting a new trial on that basis "is **[**8]** appropriate if 'the jury has reached a seriously erroneous result or . . . the verdict is a miscarriage of justice.'" *Id.* (quoting *DLC Mgmt. Corp. v. Town of Hyde Park*, 163 F.3d 124, 133 (2d Cir. 1998) (alteration in original)).

B. The Evidence at Trial

In July 1995, Amorgianos, then in his early 40s and a bridge painter since 1974, began work for Amtrak on the Steinway Street Bridge project (the "project"). The project required sandblasting away old lead-based paint and repainting a street overpass in Astoria, Queens. As Amorgianos's duties entailed stripping and painting, he was required to work inside a containment enclosure built to protect pedestrians from lead paint dust and paint overspray (the "containment").

At trial, there was conflicting evidence over whether Amtrak had supplied proper safety equipment, including organic vapor filters for the respirators that painters use to protect themselves from chemical exposure. There was also evidence suggesting that Amorgianos had used his respirator improperly. Amorgianos testified that during the last two weeks of the project, while spray painting inside the containment, he used a lead dust filter (which **[**9]** does not protect against paint fumes) because Amtrak had failed to provide a sufficient supply of organic vapor filters for the **[*262]** respirators. He also testified that, during these two weeks, there was no ventilation inside the containment because the containment's fresh air louvers were kept closed during painting and no fans were used.

Due to Amtrak's alleged failure to provide proper safety equipment and to ensure sufficient ventilation inside the containment, Amorgianos claimed that he suffered overexposure to xylene, an organic solvent, which caused him to fall acutely ill on August 28, 1995, with symptoms of fever, swollen joints, itchiness, headache, and difficulty moving. He testified that his condition worsened thereafter and that he now has no feeling in his hands, he drops things, his knees buckle beneath him, and he cannot walk as well as he could before the exposure. In addition, he claimed that he has no reflexes in the left side of his body, his whole body is numb and tingly, and he can no longer engage in outdoor or athletic activities.

To establish the necessary causal link between Amorgianos's alleged ailments and his workplace exposure to organic solvent vapors, plaintiffs **[**10]** offered the testimony of two experts at the trial before Judge Korman: industrial hygienist Jack Caravanos and Dr. Jacqueline Moline, a board-certified internist and director of the occupational medicine program at Mount Sinai Hospital in Manhattan. Caravanos testified that a lead dust filter would be ineffective to protect against organic vapor exposure and stated that the ventilation inside the containment would have been insufficient because the containment's fresh air louvers were not open during painting and no fans were used. Caravanos also testified that the xylene level inside the containment was in the "thousands" of parts per million (ppm), whereas OSHA regulations set the limit for personal exposure to xylene at 100 ppm. Although Caravanos opined that exposure to xylene at these levels could cause the symptoms from which Amorgianos claimed to suffer, Judge Korman did not permit Caravanos to testify regarding the specific cause of Amorgianos's alleged ailments.

Dr. Moline, Amorgianos's treating physician, testified that Amorgianos suffered from persistent peripheral neuropathy, a central nervous system disorder, that was caused by workplace exposure to organic solvents. **[**11]** ¹ **[**12]** Dr. Moline based her conclusions largely on the timing of the onset of his symptoms, the manifestation of his symptoms, and her elimination of other known causes of his ailments, such as diabetes. She testified that Amorgianos's symptoms have essentially remained constant during the time she has treated him, that he is profoundly weak, that the range of motion in his limbs is limited, that he has difficulty moving his knees, and that he cannot lift his left arm. She stated at trial, however, that as an internist, she was not personally qualified to interpret certain medical test results, including Amorgianos's nerve conduction studies and electromyography results. ² Accordingly, she **[*263]** relied on other doctors' opinions regarding the results of those tests.

At trial, Amtrak countered plaintiffs' evidence with a surveillance video of Amorgianos walking without apparent difficulty, drinking several cups of coffee at a cafe, and smoking cigarettes. The defense also offered medical records from Ohio that were prepared following a car accident in 1996, which revealed, *inter alia*, that Amorgianos had a strong hand grasp and steady gait, that he denied weakness or numbness, that his reflexes were good, that his cranial nerve examination was normal, and that his motor strength was five out of five. These records were in direct conflict with the opinion offered by his treating physician and expert, Dr. Moline, summarized above.

Defendant also produced the expert testimony of independent medical examiner Dr. Michael Rubin, a neurologist, who testified that his examination **[**13]** of Amorgianos revealed no abnormal findings, except for during sensation testing, which is based on information supplied by the patient. Dr. Rubin testified that Amorgianos's reported symptoms, i.e., greater weakness on the left side, is inconsistent with polyneuropathy or peripheral neuropathy, which would typically manifest in bilateral, symmetrical symptoms. In addition, defendant offered the testimony of Dr. Murray Budabin, another neurologist who examined Amorgianos, whose findings were consistent with Dr. Rubin's.

After the jury returned a verdict in plaintiffs' favor, Judge Korman concluded that granting a new trial was appropriate because, in his determination, "there was a miscarriage of justice in this case." The grounds for this decision included (1) the fact that the only experts qualified to interpret Amorgianos's neurological tests (Dr. Rubin and Dr. Budabin) concluded that the "results were normal and that at most [they] reflected a pinched nerve . . . in the neck"; (2) Amorgianos's medical records from Ohio, which "if you believe them, show that [] the Plaintiff is a liar and a fraud, and that Dr. Moline's diagnosis is completely wrong"; (3) the video surveillance **[**14]** that revealed Amorgianos walking more than a quarter of a mile "without any difficulty"; (4) the testimony of the defense

¹ "'Neuropathy' is a general term that denotes 'any disorder affecting any segment of the nervous system,' *Stedman's Medical Dictionary* 1048 (25th ed. 1990), while 'peripheral neuropathy' or 'peripheral polyneuropathy' ["PN"] is a somewhat more specific term that denotes a 'disease process involving a number of peripheral nerves,' *id.* at 1236. PN usually affects both sensory and motor function." [Amorgianos, 137 F. Supp. 2d at 181.](#)

² As Judge Trager explained in his *Daubert* ruling, "neurological abnormalities may be observed on some neurophysiological or neuroradiological measures, such as CT and MRI scans, electromyography, and electroencephalography." [Amorgianos, 137 F. Supp. 2d at 181.](#)

neurologists that the symptoms of toxically-induced peripheral neuropathy typically present in a symmetrical pattern, whereas Amorgianos complained of asymmetrical symptoms; and (5) the fact that there was no paint residue on the respirator Amorgianos had allegedly been using when he fell ill on August 28, 1995.

Judge Korman stressed that none of these factors taken alone would have been sufficient to upset the jury verdict, but that when taken together, along with the

problems about testimony regarding general causation, and questions about whether this incident happened in the way that the Plaintiff said it would have, which bears on the testimony of your other expert [Caravanos], . . . suggest that this is a verdict that is seriously erroneous or a miscarriage of justice, and clearly against the weight of the evidence. And for that reason I'm going to grant the Motion for a New Trial.

Contending that the district court's grant of defendant's motion for new trial was grounded on the district court's post-trial determination that plaintiffs' expert **[**15]** testimony was unreliable and insufficient, plaintiffs argue that the district court abused its discretion in granting a new trial. Plaintiffs mischaracterize the district court's grant of a new trial as a post-trial Daubert ruling. As discussed above, the district court identified several pieces of evidence that, when taken together, suggest that the jury verdict in this case was a manifest miscarriage of justice because it **[*264]** was against the weight of the evidence. It was not a ruling based on a post-trial Daubert motion. Cf. Macsenti v. Becker, 237 F.3d 1223, 1230-34 (10th Cir.) (concluding that Daubert motion at the close of evidence was untimely; reviewing for plain error district court's admission of allegedly improper evidence under Daubert), cert. denied, 533 U.S. 950, 150 L. Ed. 2d 752, 121 S. Ct. 2593 (2001); Marbled Murrelet v. Babbitt, 83 F.3d 1060, 1066-67 (9th Cir. 1996) (concluding that party's post-trial challenge to plaintiff's evidence on Daubert grounds was untimely and had been waived).

The record makes clear that the district court was cognizant of the issues implicated by a post-trial Daubert **[**16]** ruling and did not base its grant of defendant's motion for new trial on the conclusion that plaintiffs' experts should have been excluded under Daubert. Nor did the district court conclude that plaintiffs' case was insufficient as a matter of law. In fact, the district court stated on the record that it was basing its determination on the weight of the evidence "and the question is whether the weight of the evidence was so overwhelmingly inconsistent [with the verdict]."

In light of the conflicting evidence summarized above, particularly the Ohio medical records and the surveillance video, the district court had a reasonable basis for finding that the jury verdict was against the weight of the evidence. We thus easily conclude that there was no abuse of discretion and affirm the district court's grant of defendant's motion for new trial.

II. Expert Evidence Under Daubert

After the grant of defendant's motion for new trial and the transfer of the case to Judge Trager for further proceedings, defendant successfully filed a motion under Daubert to exclude plaintiffs' scientific and medical experts from testifying at trial. See Amorgianos, 137 F. Supp. 2d at 160, 191. **[**17]** Plaintiffs argue that the district court's exclusion of the expert testimony was an abuse of discretion.

Specifically, plaintiffs contend that the district court overstepped its role in evaluating the expert evidence and that the district court imposed standards more stringent than those contemplated by the Supreme Court in Daubert. Claiming that Judge Trager "traded a judicial robe for a white lab coat in assessing the validity, reliability and 'fit' of the scientific materials relied upon by Amorgianos' experts," plaintiffs maintain that he usurped the role of the jury and the experts by assessing the credibility, rather than the admissibility, of the expert testimony and by rendering his own opinion based on the scientific literature. For the reasons that follow, we reject plaintiffs' contentions.

A. Standard of Review

We review a district court's determination to admit or exclude expert testimony under Daubert for abuse of discretion. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 152, 143 L. Ed. 2d 238, 119 S. Ct. 1167 (1999); Gen. Elec. Co. v. Joiner, 522 U.S. 136, 141-42, 139 L. Ed. 2d 508, 118 S. Ct. 512 (1997) (holding that "abuse [**18] of discretion is the proper standard of review of a district court's evidentiary rulings" and that Daubert did not alter this general standard). As the Supreme Court explained in Kumho Tire, "our opinion in Joiner makes clear that a court of appeals is to apply an abuse-of-discretion standard when it 'reviews a trial court's decision to admit or exclude expert testimony.'" 526 U.S. at 152 (quoting Joiner, 522 U.S. at 138-39); see, e.g., Campbell v. Metro. Prop. & Cas. Ins. Co., 239 F.3d 179, 185 (2d Cir. 2001) (same).

[*265] A decision to admit or exclude expert scientific testimony is not an abuse of discretion unless it is "manifestly erroneous." McCulloch v. H.B. Fuller Co., 61 F.3d 1038, 1042 (2d Cir. 1995); accord Joiner, 522 U.S. at 142; Campbell, 239 F.3d at 185. Significantly, the abuse of discretion standard "applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion." Kumho Tire, 526 U.S. at 152 (emphasis added). Thus, in analyzing the admissibility of expert evidence, the district court has broad [**19] discretion in determining what method is appropriate for evaluating reliability under the circumstances of each case.

B. District Court's Role Under Daubert

Rule 702 of the Federal Rules of Evidence, which governs the admissibility of expert and other scientific or technical expert testimony, provides as follows:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Fed. R. Evid. 702.

Interpreting Rule 702 in Daubert, the Supreme Court rejected the traditional Frye rule, under which courts required that a scientific theory be generally accepted by the scientific community in order to be admissible. Daubert, 509 U.S. at 585-89; see Frye v. United States, 54 App. D.C. 46, 293 F. 1013, 1014 (D.C. Cir. 1923); [**20] see also Zuchowicz v. United States, 140 F.3d 381, 386 n.5 (2d Cir. 1998) (discussing Supreme Court's rejection of Frye). Concluding that the bright-line "general acceptance" test established in Frye was at odds with the "liberal thrust" of the Federal Rules of Evidence, Daubert, 509 U.S. at 588 (internal quotation marks omitted), the Supreme Court has made clear that the district court has a "gatekeeping" function under Rule 702 -it is charged with "the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." Id. at 597; accord Campbell, 239 F.3d at 184; Federal Judicial Center, Reference Manual on Scientific Evidence 11 (2d ed. 2000).

In fulfilling this gatekeeping role, the trial court should look to the standards of Rule 401 in analyzing whether proffered expert testimony is relevant, i.e., whether it "has any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Campbell, 239 F.3d at 184 (quoting Fed. R. Evid. [**21] 401) (alteration in original). Next, the district court must determine "whether the proffered testimony has a sufficiently 'reliable foundation' to permit it to be considered." Id. (quoting Daubert, 509 U.S. at 597). In this inquiry, the district court should consider the indicia of reliability identified in Rule 702, namely, (1) that the testimony is grounded on sufficient facts or data; (2) that the testimony "is the product of reliable principles and methods"; and (3) that "the witness has applied the principles and methods reliably to the facts of the case." Fed. R. Evid. 702. In short, the district court must "make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom [**266] the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." Kumho Tire, 526 U.S. at 152.

Although [Rule 702](#) sets forth specific criteria for the district court's consideration, the [Daubert](#) inquiry is fluid and will necessarily vary from case to case. The Supreme Court has identified a number of factors bearing on reliability that district courts may consider, **[**22]** such as (1) whether a theory or technique "can be (and has been) tested," [Daubert, 509 U.S. at 593](#); (2) "whether the theory or technique has been subjected to peer review and publication," [id.](#); (3) a technique's "known or potential rate of error," and "the existence and maintenance of standards controlling the technique's operation," [id. at 594](#); and (4) whether a particular technique or theory has gained "general acceptance" in the relevant scientific community," [id.](#) See also [Fed. Deposit Ins. Corp. v. Suna Assocs., Inc., 80 F.3d 681, 687 \(2d Cir. 1996\)](#) (discussing [Daubert](#) factors); Jack B. Weinstein & Margaret A. Berger, [Weinstein's Federal Evidence § 702.05\[2\]\[a\]](#), at 702-66 to 702-72.2 (Joseph M. McLaughlin ed., 2d ed. 2002) (listing factors for the district court's consideration identified in [Daubert](#) and its progeny). These factors do not constitute, however, a "definitive checklist or test." [Daubert, 509 U.S. at 593](#). Rather, "the inquiry envisioned by [Rule 702](#) is . . . a flexible one," [id. at 594](#), and "the gatekeeping inquiry must be tied to the facts of a particular case," [Kumho Tire, 526 U.S. at 150 \[**23\]](#) (internal quotation marks omitted).

In undertaking this flexible inquiry, the district court must focus on the principles and methodology employed by the expert, without regard to the conclusions the expert has reached or the district court's belief as to the correctness of those conclusions. See [Daubert, 509 U.S. at 595](#). But, as the Supreme Court recognized in [Joiner](#),

conclusions and methodology are not entirely distinct from one another. . . . Nothing in either [Daubert](#) or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.

[Joiner, 522 U.S. at 146](#). Thus, when an expert opinion is based on data, a methodology, or studies that are simply inadequate to support the conclusions reached, [Daubert](#) and [Rule 702](#) mandate the exclusion of that unreliable opinion testimony. See [Heller v. Shaw Indus., Inc., 167 F.3d 146, 153 \(3d Cir. 1999\)](#) ("[A] district court must examine the expert's conclusions in order **[**24]** to determine whether they could reliably follow from the facts known to the expert and the methodology used.").

This is not to suggest that an expert must back his or her opinion with published studies that unequivocally support his or her conclusions. See [Bonner v. ISP Techs., Inc., 259 F.3d 924, 929 \(8th Cir. 2001\)](#) (observing that "there is no requirement 'that a medical expert must always cite published studies on general causation in order to reliably conclude that a particular object caused a particular illness'" (quoting [Heller, 167 F.3d at 155](#)); see also [Fed. Deposit Ins. Corp., 80 F.3d at 687](#) (finding no abuse of discretion in the admission of expert testimony based on a hybrid of two widely used methods). In [McCulloch](#), for example, we affirmed the district court's admission of medical expert testimony despite the fact that the expert "could not point to a single piece of medical **[*267]** literature" that specifically supported the expert's opinion. [61 F.3d at 1043](#). Where an expert otherwise reliably utilizes scientific methods to reach a conclusion, lack of textual support may "go to the weight, not the admissibility" **[**25]** of the expert's testimony. [Id. at 1044](#); see also [Zuchowicz, 140 F.3d at 387](#). A contrary requirement "would effectively resurrect a [Frye](#)-like bright-line standard, not by requiring that a methodology be 'generally accepted,' but by excluding expert testimony not backed by published (and presumably peer-reviewed) studies." [Heller, 167 F.3d at 155](#). Such a bright-line requirement would be at odds with the liberal admissibility standards of the federal rules and the express teachings of [Daubert](#). See [McCulloch, 61 F.3d at 1042, 1044](#).

The flexible [Daubert](#) inquiry gives the district court the discretion needed to ensure that the courtroom door remains closed to junk science while admitting reliable expert testimony that will assist the trier of fact. To warrant admissibility, however, it is critical that an expert's analysis be reliable at every step. As Chief Judge Becker of the Third Circuit has explained, the [Daubert](#) "requirement that the expert testify to scientific knowledge -- conclusions supported by good grounds for each step in the analysis -- means that any step that renders the analysis unreliable **[**26]** under the [Daubert](#) factors renders the expert's testimony inadmissible." [In re Paoli R.R. Yard PCB Litig., 35 F.3d 717, 745 \(3d Cir. 1994\)](#); see also [Heller, 167 F.3d at 155](#) ("The reliability analysis applies to all aspects of an expert's testimony: the methodology, the facts underlying the expert's opinion, the link between the facts and the conclusion, *et alia*.").

In deciding whether a step in an expert's analysis is unreliable, the district court should undertake a rigorous examination of the facts on which the expert relies, the method by which the expert draws an opinion from those facts, and how the expert applies the facts and methods to the case at hand. A minor flaw in an expert's reasoning or a slight modification of an otherwise reliable method will not render an expert's opinion *per se* inadmissible. "The judge should only exclude the evidence if the flaw is large enough that the expert lacks 'good grounds' for his or her conclusions." [In re Paoli, 35 F.3d at 746](#); see [Daubert, 509 U.S. at 590](#). This limitation on when evidence should be excluded accords with the liberal admissibility standards **[**27]** of the federal rules and recognizes that our adversary system provides the necessary tools for challenging reliable, albeit debatable, expert testimony. As the Supreme Court has explained, "vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." [Daubert, 509 U.S. at 596](#); accord Weinstein, § 702.05[3] at 702-76.

In addition, if the admissible evidence is insufficient to permit a rational juror to find in favor of the plaintiff, the court remains free to direct a verdict or grant summary judgment for defendant. See [Weisgram v. Marley Co., 528 U.S. 440, 455-56, 145 L. Ed. 2d 958, 120 S. Ct. 1011 \(2000\)](#) (affirming appellate grant of judgment as a matter of law where court of appeals concluded that expert testimony was erroneously admitted and found the remaining evidence insufficient to support the jury's verdict); [Daubert, 509 U.S. at 596](#) (citing [Fed. R. Civ. P. 50\(a\) & 56](#)); see, e.g., [Brooks v. Outboard Marine Corp., 234 F.3d 89, 92 \(2d Cir. 2000\)](#) (per curiam) (affirming **[**28]** district court's grant of summary judgment). We have cautioned, however, that the district **[*268]** court's *Daubert* gatekeeping role does not permit the district court, in ruling on evidentiary sufficiency, to reject admissible expert testimony. See [In re Joint E. & S. Dist. Asbestos Litig., 52 F.3d 1124, 1132-34 \(2d Cir. 1995\)](#); see also [Marbled Murrelet, 83 F.3d at 1066-67](#). Once the district court has deemed the evidence sufficiently reliable so as to be admissible, it is "bound to consider the evidence in the light most favorable to plaintiff" when deciding motions for summary judgment or judgment as a matter of law. [In re Joint, 52 F.3d at 1135](#).

C. The District Court's Conclusions

In this case, plaintiffs argue that the district court's *Daubert* ruling usurped the jury's function. They contend that the defects, if any, with respect to their proffered expert testimony went to its weight, not its admissibility. We disagree.

As Judge Trager observed, to establish their case under New York law, plaintiffs would have to prove that Amorgianos suffered from overexposure to xylene and that he is ill; they are also required to "produce **[**29]** expert opinion evidence based on suitable hypotheses in order to support a finding of causation." [Amorgianos, 137 F. Supp. 2d at 160](#) (internal quotation marks omitted). More specifically, to establish causation, they must offer admissible expert testimony regarding both general causation, i.e., that xylene exposure can cause the type of ailments from which Amorgianos claims to suffer; and specific causation, i.e., that xylene exposure actually caused his alleged neurological problems. [Id. at 161](#); see [Zuchowicz, 140 F.3d at 383](#) ("There is . . . no older requirement in this area of law than the need to show such a link [i.e., medical causation] between the defendant's actions and the plaintiff's loss.").

As set forth in Judge Trager's comprehensive opinion, the testimony of Amorgianos's experts was fatally flawed with respect to the duration and degree of Amorgianos's exposure to xylene, and on the issues of general and specific causation. The district court thus had a sound basis for each of its carefully circumscribed exclusions of plaintiffs' expert testimony.

With respect to Caravanos, plaintiffs' industrial hygienist, the district **[**30]** court rejected his testimony regarding the xylene concentration inside the containment because Caravanos failed to apply his own methodology reliably. Caravanos testified that the evaporation rate of a solvent from paint "(and, hence, the resulting concentration of solvent vapor in an enclosed space) depends on the volatility/vapor pressure of the particular solvent in question, temperature, humidity and 'radiant energy', and that 'proper exposure assessment'" would consider those variables. [Amorgianos, 137 F. Supp. 2d at 174](#) (quoting Trial Tr. at 41 (June 18, 1998)). In reaching his conclusion about Amorgianos's exposure, however, "Caravanos did not include any of these variables in his calculations. Instead, he

included only variables for the amount of paint used, its xylene content, and the volume of the containment" *Id.* (citations omitted). Although data on the additional variables was available to Caravanos, he inexplicably "did not find it necessary" to include them in his calculation despite his stated opinion that a "proper exposure assessment" would take them into consideration. *Id. at 174, 175 n.16*. In light of his failure to **[**31]** apply the proper method for determining concentration and trial testimony suggesting that the solvent was evaporating from the paint more slowly than usual, the district court **[*269]** excluded Caravanos's opinion as unreliable. ³ *Id. at 174-75*.

Because Caravanos's opinion rested on a faulty assumption due to his failure to apply his stated methodology "reliably to the facts of the case," *Fed. R. Evid. 702*, Caravanos's expert opinion regarding the xylene concentration to which Amorgianos was exposed was not based on "good grounds." *In re Paoli, 35 F.3d at 746*. Accordingly, the district court's exclusion of Caravanos's testimony regarding the xylene concentration inside **[**32]** the containment was not an abuse of discretion.

With respect to the court's exclusion of plaintiffs' experts' general causation testimony, Judge Trager conducted an extremely thorough review of the scientific literature on which plaintiffs' experts relied, *see Amorgianos, 137 F. Supp. 2d at 192-216*. Although this degree of review, while commendable, may not always be necessary to evaluate whether proffered expert testimony is admissible, Judge Trager's evaluation of the fit between the experts' opinions and the scientific literature on which they relied was certainly within the broad discretion afforded to the district court under *Daubert* and its progeny, and did not impinge upon the jury's function. It is precisely such an undertaking that assures that an expert, when formulating an opinion for use in the courtroom, will employ the same level of intellectual rigor as would be expected in the scientific community.

The Supreme Court recognized in *Joiner* that the district court may carefully review the studies on which proffered experts rely in forming their opinions:

Because it was within the District Court's discretion to conclude that the studies **[**33]** upon which the experts relied were not sufficient, whether individually or in combination, to support their conclusions that Joiner's exposure to PCB's contributed to his cancer, the District Court did not abuse its discretion in excluding their testimony.

Joiner, 522 U.S. at 146-47. Accordingly, we reject plaintiffs' assertion that the district court's method of evaluating the reliability of the experts constituted a usurpation of the jury's and experts' roles.

We hold that the district court's exclusion of all of plaintiffs' expert general causation testimony with respect to Amorgianos's long-term ailments ⁴ was not an abuse of discretion. As succinctly summarized by the district court, plaintiffs needed to offer admissible expert causation testimony to establish the following hypothesis:

that exposure to xylene in amounts averaging 500 to 2000 ppm on August 28, 1995 and each of preceding three workdays, and for three to five hour periods on intermittent days in the preceding thirty days can, as a general matter, cause the complex of [central nervous **[*270]** system] and [peripheral nervous system] symptoms that Mr. Amorgianos alleges.

Amorgianos, 137 F. Supp. 2d at 178. **[**34]**

³ Recognizing, however, that Caravanos could remedy the defects in his testimony regarding the concentration in the containment by applying the proper method, the district court granted plaintiffs leave to supplement his expert report. *Amorgianos, 137 F. Supp. 2d at 175*. Plaintiffs declined to do so.

⁴ As mentioned above, the district court denied defendant's motion to exclude plaintiffs' expert testimony on the issue of the general causation of the acute symptoms (such as eye irritation, nausea, and fever) that Amorgianos allegedly suffered in the two to three days after August 28, 1995, provided that plaintiffs produce admissible evidence on the xylene concentration inside the containment. *Amorgianos, 137 F. Supp. 2d at 191*.

With respect to Amorgianos's treating physician, Dr. Moline, the district court thoroughly reviewed all of the materials on which she relied in forming her opinion and concluded that there was "too great an 'analytical gap' between the conclusions reached by the authors of Dr. Moline's cited articles and the conclusions that she draws from their work." *Id.* at 185. Although Dr. Moline relied on a number of published articles in concluding that Amorgianos's xylene exposure caused him to suffer from polyneuropathy, the district court's close analysis **[**35]** of those studies revealed that (1) none of them provides evidence of the neurological effects of short-term xylene exposure; (2) all of the articles involved individuals who were exposed to a variety of solvents, many of which were not contained in the paint Amorgianos used; and (3) all of the articles connecting solvent exposure to peripheral nervous system symptoms found evidence of symmetrical polyneuropathy only, not of the asymmetrical symptoms of which Amorgianos complained. *Id.*

Accordingly, for the reasons stated in its thorough opinion, we find that the district court did not abuse its discretion in excluding Dr. Moline's testimony upon reasonably concluding that the analytical gap between the studies on which she relied and her conclusions was simply too great and that her opinion was thus unreliable. See *Joiner*, 522 U.S. at 146-47; see, e.g., *Meister v. Med. Eng'g Corp.*, 267 F.3d 1123, 1132 (D.C. Cir. 2001) (affirming judgment as a matter of law for defendant where plaintiff's experts relied on epidemiological evidence that failed to establish a causal link between breast implants and the disease from which plaintiff suffered). **[**36]**

For the same reasons, the district court's rejection of Dr. Rutchik's and Caravanos's general causation opinion testimony was also not an abuse of discretion. See *Amorgianos*, 137 F. Supp. 2d at 185-88 (discussing problem of "fit" between Dr. Rutchik's conclusions and the articles upon which he relied); *id.* at 188-91 (discussing Caravanos's lack of qualifications, as an industrial hygienist, to theorize regarding general medical causation and the unreliable methodology he used; pointing out that Caravanos "did not actually read a single article as part of his literature survey").

Under the Supreme Court's analysis in *Joiner* and its unequivocal statement in *Kumho Tire* that the district court has discretion in deciding how to determine reliability, we conclude that the approach the district court used in this case was not an abuse of discretion. The district court's rigorous analysis of the methods that plaintiffs' experts used in reaching their opinions was appropriate given the facts of this case. In light of the defects in the methodologies employed by plaintiffs' experts and the district court's reasonable determination that there was **[**37]** a significant "analytical gap" between the experts' opinions and the studies on which they relied in reaching their conclusions, the district court's exclusion of plaintiffs' experts' testimony because it was not grounded in science was well within its discretion. See *Amorgianos*, 137 F. Supp. 2d at 191 (concluding that plaintiffs' experts' "opinions are not based on 'scientific . . . knowledge' and will not assist the jury in determining the issue of causation in this case").

III. Motion for Summary Judgment

Having concluded that the district court did not abuse its discretion in granting defendant's *Daubert* motion, we also affirm the district court's grant of defendant's **[*271]** motion for summary judgment. In the absence of any expert evidence as to general causation and a gap in plaintiffs' case with respect to Amorgianos's xylene exposure due to the deficiencies in Caravanos's testimony regarding the xylene concentration inside the containment, defendant was entitled to summary judgment because of plaintiffs' failure to present any admissible evidence in support of their theory of causation. See, e.g., *Brooks*, 234 F.3d at 92 (affirming district **[**38]** court's grant of summary judgment where plaintiff had no expert evidence to support a finding of causation under his design defect theory after his expert was excluded); see also *Raskin v. Wyatt Co.*, 125 F.3d 55, 65-67 (2d Cir. 1997) (holding that it is appropriate for the district court to determine the admissibility of scientific and other evidence and to rely only on admissible evidence in ruling on summary judgment).

CONCLUSION

For the foregoing reasons, the judgments of the district court are affirmed.

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