Filed 1/31/05

CERTIFIED FOR PARTIAL PUBLICATION*

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA

SECOND APPELLATE DISTRICT

DIVISION THREE

LOCKHEED LITIGATION CASES.	B166347 (JCCP No. 2967) (Los Angeles County Super. Ct. Nos. NCC37769, NCC40592, NCC 40593, NCC40594, EC004545, EC004547 & EC004555)

APPEAL from a judgment of the Superior Court of Los Angeles County, John A. Torribio, Judge. Affirmed.

Girardi and Keese, Thomas V. Girardi, Howard B. Miller, Robert W. Finnerty and Carrie J. Rognlien for Plaintiffs and Appellants.

Horvitz & Levy, Ellis J. Horvitz, David M. Axelrad and Mary-Christine Sungaila for Defendants and Respondents ExxonMobil Corporation and Union Oil Company of California.

Steptoe & Johnson, Laurence F. Janssen and Lawrence P. Riff for Defendant and Respondent ExxonMobil Corporation.

---

* Pursuant to California Rules of Court, rules 976(c) and 976.1, this opinion is certified for publication with the exception of part 6 of the Discussion.

Morgan, Lewis & Bockius, V. Thomas Meador III and Deanne L. Miller for Defendant and Respondent Union Oil Company of California.

Latham & Watkins, Ernest J. Getto, Kirk A. Wilkinson, Cynthia H. Cwik; Tatro Tekosky Sadwick & Mendelson and Rene Tatro for American Chemistry Council as Amicus Curiae on behalf of Defendants and Respondents.

Atlantic Legal Foundation, Martin S. Kaufman and Stephen E. Johnson for Robert K. Adair, D. Allan Bromley, Ronald E. Gots, Clark W. Heath, Dudley Herschbach, Steven Lamm, A. Alan Moghissi, Rodney Nichols, Robert Nolan, Richard Wilson and Lee Zwanziger as Amici Curiae on behalf of Defendants and Respondents.

Fred J. Hiestand for Californians Allied for Patient Protection and The Civil Justice Association of California as Amici Curiae on behalf of Defendants and Respondents.

Antonio Aguilar and 23 other plaintiffs (collectively Plaintiffs) appeal a judgment in favor of ExxonMobil Corporation (Exxon) and Union Oil Company of California (Union Oil) (collectively Defendants).[1] Plaintiffs seek damages for injuries allegedly

---

[1] The plaintiffs party to this appeal as appellants are: Antonio Aguilar, Sandy B. Arnold, Edward Basura, Russell Bates, Braxton G. Berkley, Chris Lee Brunson, Zoda Butler, Rudy J. Dominguez, Sr., Edward Espino, Michael P. Esquivel, Donald Garin, Helen F. Gover, Eddie L. Hall, Howard Love, Renee Lyons, David H. Meza, Johnny Moody, Jack Montoya, Joe Sanchez, Artie Shaw, Lamar Shelby, Mattie Walker, Ruth E. Wilson, and Frank Windhausen.

caused by exposure to toxic chemicals. The trial court before trial excluded expert testimony by Plaintiffs' expert, Dr. Daniel Teitelbaum, on the issue of causation and then granted Defendants' oral motion to dismiss the complaint. Plaintiffs contend the exclusion was error and the dismissal was procedurally improper.

Dr. Teitelbaum principally relied on epidemiological studies to support his opinion of causation. All of the studies involved exposure to multiple solvents, including solvents that are not at issue here. The trial court concluded that the multiple-solvent epidemiological studies that Dr. Teitelbaum relied on provided no reasonable basis for an opinion that any one of the solvents here at issue can cause disease. We conclude that the court properly exercised its discretion under Evidence Code section 801, subdivision (b), in reaching that conclusion and that the court properly excluded the expert testimony. The court also concluded that an epidemiological study can provide a reasonable basis for an expert opinion of causation only if the study shows a relative risk of greater than 2.0.[2] We conclude that that conclusion was error and that a court cannot exclude an epidemiological study from consideration solely because the study shows a relative risk of less than 2.0. However, we find that the error was not prejudicial. We also conclude that Plaintiffs have shown no prejudicial error in other arguments concerning the exclusion of expert testimony and that Plaintiffs invited and waived any error with respect to the dismissal. We therefore affirm the judgment.

FACTUAL AND PROCEDURAL BACKGROUND

1. *Prior Proceedings in These Coordinated Actions*

Former and current employees of Lockheed Corporation (Lockheed) sued Lockheed and manufacturers and suppliers of chemicals, seeking damages for personal injuries allegedly caused by occupational exposure to chemicals. The actions were coordinated in Lockheed Litigation Cases, Judicial Council Coordination Proceeding

---

[2] Relative risk is a measure of the degree of association between exposure to a particular agent and disease, as discussed *post*.

No. 2967. The coordinated actions have been tried in groups of plaintiffs. The Court of Appeal has decided appeals arising from six prior trials and one summary judgment.

In a case management order filed in December 2000, the trial court ordered hearings to determine whether the plaintiffs' expert's opinion on the issue of "general causation" would be admissible in the trial of the plaintiffs' wrongful death claims (Group 6B). The case management order also provided that similar hearings could be held prior to other group trials.

a. *The Group 6B Appeal*

After a series of hearings, the court determined in an order dated June 15, 2001, that (1) Dr. Teitelbaum's expert opinion on causation was based on a survey of epidemiological studies that did not support the conclusion that the chemicals at issue in the Group 6B trial can cause cancer, and (2) as a matter of law, an expert reasonably can rely on an epidemiological study to support an opinion on causation only if the study shows a relative risk of greater than 2.0. Exxon and Union Oil moved for summary judgment on the ground that the Group 6B plaintiffs could not establish the element of causation. The court excluded Dr. Teitelbaum's declaration, concluded that there was no admissible evidence to establish causation, and granted summary judgment. We affirmed the judgment. (*Lockheed Litigation Cases* (2004) 115 Cal.App.4th 558.)

b. *This Appeal*

Plaintiffs in this appeal, known as Groups 4 and 5, seek damages for injuries allegedly caused by exposure to acetone, toluene, methyl ethyl ketone (MEK), and isopropyl alcohol supplied by Exxon, and exposure to MEK and super high flash naptha supplied by Union Oil. The superior court previously conducted separate trials on the Groups 4 and 5 plaintiffs' claims and awarded compensatory and punitive damages against the defendants. The Court of Appeal in two separate appeals concluded that the trial court misapplied collateral estoppel with respect to prior findings that warnings provided by the defendants were inadequate, and reversed the judgments. The Court of Appeal also determined that the plaintiffs were not entitled to recover punitive damages. (*Arnold v. Ashland Chemical Company* (Feb. 18, 2000, B121434) [nonpub. opn.];

Aguilar v. Ashland Chemical Company (June 6, 2000, B128469) [nonpub. opn.].) On remand, the trial court consolidated the two groups for retrial.

2. *Hearing on the Admissibility of Expert Testimony for Groups 4 and 5*

On remand, Exxon and Union Oil in January and February 2002 moved for hearings to determine whether the plaintiffs' experts' opinions on the issue of causation would be admissible in the retrial of the Groups 4 and 5 plaintiffs' claims. Defendants argued that Plaintiffs' experts' opinions were not based on matter that provided a reasonable basis for the opinions and, as to some plaintiffs, that the opinions were not based on methodologies generally accepted in the scientific community. Plaintiffs argued in opposition that (1) Defendants' motions were a disguised attempt to have the court decide the issue of causation before trial, and that the court had no authority to do so; (2) Plaintiffs need only establish that their experts were qualified and that their expert opinions were based on reliable matter as required by Evidence Code section 801, subdivision (b); and (3) the experts' opinions were not based on a new scientific technique and therefore were not subject to the admissibility test of *People v. Kelly* (1976) 17 Cal.3d 24.

The court issued a second case management order in April 2002. The court ordered Plaintiffs and Defendants to file expert declarations in support of their respective positions regarding "general causation" as to each chemical at issue and each alleged illness, and ordered the parties to lodge with the court all medical and scientific literature upon which their experts relied.

Plaintiffs filed a declaration by Dr. Teitelbaum on May 6, 2002, stating his opinion that the chemicals at issue can cause or can be significant factors in the causation of the diseases suffered by Plaintiffs. Attached to the declaration were 770 pages of documents on which Dr. Teitelbaum relied in forming his opinion. Plaintiffs filed a corrected declaration by Dr. Teitelbaum on May 30, 2002, together with material safety data sheets, transcripts of prior testimony by Dr. Teitelbaum, and approximately 1,700 pages of epidemiological studies, animal toxicology studies, case reports, and other materials on which he relied. Plaintiffs also filed a supplemental declaration by Dr. Teitelbaum on

May 30, 2002, explaining his reliance on some of the cited materials and providing additional materials. The court conducted a hearing in June 2002 in which Dr. Teitelbaum testified as to how he reached his conclusions, the methodology that he applied, and other matters.

Defendants argued that the materials on which Dr. Teitelbaum relied to support his opinion of causation failed to provide a reasonable basis for his opinion as required by Evidence Code section 801, subdivision (b). They argued that (1) the epidemiological studies on which Dr. Teitelbaum relied did not support his opinion because the studies all involved exposure to multiple solvents, including solvents that were not at issue in this litigation, and because the studies did not show a relative risk of greater than 2.0; (2) animal toxicology studies without supporting human epidemiological studies cannot support an opinion of causation in human beings as a matter of law, and Plaintiffs failed to provide evidence explaining why the animal studies on which Dr. Teitelbaum relied are probative of causation in human beings and how to extrapolate from the results of the animal studies to an opinion of causation in human beings; (3) clinical reports are merely anecdotal evidence that may suggest a hypothesis of causation but cannot support an opinion of causation; and (4) apart from the foregoing, Dr. Teitelbaum misrepresented the contents of some of the materials and attributed to the authors of those materials conclusions that were not expressly stated and could not reasonably be inferred.

The court stated at a status conference in August 2002 that it would issue a detailed tentative ruling on the admissibility of Dr. Teitelbaum's opinion and that the parties could object to the ruling on the grounds that the court misunderstood the materials on which Dr. Teitelbaum relied or misrepresented or overlooked some part of those materials. The court stated that the tentative ruling would become final if no party objected to the ruling within 10 days after the ruling.

3. *Tentative Ruling*

The court issued a tentative ruling on August 8, 2002. It stated that the court conducted the admissibility hearing pursuant to Evidence Code section 402 and *Cottle v. Superior Court* (1992) 3 Cal.App.4th 1367 to determine whether Plaintiffs' expert's

opinion on causation was admissible. It stated, "the basis of an expert opinion is a preliminary fact that the court may rule on prior to an expert testifying before the jury." It discussed Evidence Code section 801, subdivision (b), and stated, "the question that the court is concerned with . . . is . . . do the studies relied [on] actually support the decisions rendered[?]" It stated that in making the ruling the court was concerned only with chronic adverse health effects rather than transitory conditions. It stated further that Plaintiffs must prove at trial that Defendants' products caused Plaintiffs' injuries under the substantial factor test. It stated that to prove that a product was a substantial factor in bringing about an injury, Plaintiffs must establish that the product was capable of causing the injury. The court referred to this latter requirement as proof of general causation.

The court's tentative ruling concluded that an expert reasonably can rely on an epidemiological study to support an opinion of causation only if the study "establish[es] . . . a probability of causation exceeding 50.1%." It concluded further that an epidemiological study can support an opinion of causation only if the study demonstrates a relative risk of greater than 2.0, meaning that the incidence of injury among persons exposed to the product exceeds the incidence among unexposed persons by a factor of more than 2.0. Based on these legal conclusions, the court determined that the epidemiological studies on which Dr. Teitelbaum relied did not support his opinion of causation.

The court concluded further that epidemiological studies involving exposure to many solvents cannot support a reasonable inference that a particular solvent contributed to the reported injuries. It stated, "these studies do not justify the assumption that because an illness occurs after a 'multi solvent exposure' that ipso facto each chemical in the mix is an active agent or a contributive cause. One or more of the chemicals may in fact be 'a cause' or a 'substantial factor' but this should be supported by some sort of scientific data that supports a decision about a particular chemical."

The court also considered whether animal toxicology studies can provide a reasonable basis to support an opinion of causation in human beings. It cited federal court opinions and articles discussing the issues raised by the use of animal studies,

including the need to extrapolate the results of those studies in order to draw conclusions regarding causation in human beings. It concluded that the parties provided inadequate information for the court to decide whether Dr. Teitelbaum's reliance on animal studies was proper and invited the parties to present additional evidence on the question.

The court also concluded that clinical reports are merely anecdotal and are of little value in determining causation, that information provided in the Registry of Toxic Effects of Chemical Substances published by the National Institute for Occupational Safety and Health did not support Dr. Teitelbaum's opinion of causation, and that other treatises and reference materials provided insufficient information to support Dr. Teitelbaum's opinion. The court concluded further that Dr. Teitelbaum's prior testimony in this and other litigation could not provide a reasonable basis for his present opinion, and ordered the prior testimony stricken.

The court then considered the materials that Dr. Teitelbaum relied on to support his opinion with respect to particular chemicals. The court concluded that some of Dr. Teitelbaum's references to and discussions of the materials were misleading and that the materials did not support his conclusions of causation. Finally, the court considered the materials that Dr. Teitelbaum relied on to support his opinion with respect to particular diseases, and concluded that the materials did not support his conclusions.

The court stated in its notice of tentative ruling that its ruling would effectively terminate the action as to many plaintiffs in a manner similar to a nonsuit and that Plaintiffs "should be given every opportunity to supply evidence to the court on these issues." It stated that the court had concerns about particular issues and about the adequacy of the evidence presented on those issues and listed several questions concerning reliance on epidemiological studies and animal studies. It stated further that each side could call up to three witnesses to testify further on those issues, which the court referred to as "extrapolation issues," and could move to call additional witnesses if needed, and that Plaintiffs could make an offer of proof with regard to additional evidence of general causation. The court set the matter for a hearing.

4. *Final Order Excluding Expert Testimony*

No party objected to the tentative ruling. At the first hearing after the tentative ruling, in September 2002, Plaintiffs declined to submit additional evidence or argument on the issues raised by the court. Defendants also declined.

The court issued its final ruling in September 2002 excluding Dr. Teitelbaum's testimony on causation for the reasons stated in the tentative ruling. The final order restated the tentative ruling described *ante*, with little substantive change.

5. *Dismissal and Judgment*

At a hearing in October 2002, Plaintiffs' counsel stated, "we need some finality . . . to the order that the court sent out with respect to the admissibility of experts." The court suggested either a summary judgment motion or a motion to dismiss, and suggested that the parties confer with each other and address the matter at a subsequent hearing. Counsel for Exxon agreed. Plaintiffs' counsel then stated, "what we would request is that the court dismiss it on its own motion." The court declined to do so at that time and asked whether Plaintiffs were able to proceed without Dr. Teitelbaum's opinion. Plaintiffs' counsel stated that they could not proceed. The court then suggested that Defendants could orally move to dismiss the complaint and the court could grant the motion, but stated that the parties should consider that proposed procedure and discuss the matter at the next hearing.

At a hearing one week later, Plaintiffs' counsel reported, "We have discussed a method to get a judgment, but we haven't agreed to that yet." The court suggested a sua sponte motion to dismiss and stated that the problem to avoid was a potential waiver of Plaintiffs' right to challenge on appeal the exclusion of evidence:

". . . I think that prevents the appellate court--and I don't mean this in any pejorative way--it prevents them from saying somebody's waived anything. Do you follow what I'm saying? That's what I'm concerned about. I don't want there to be any waivers inadvertently by trying to cooperate in getting this thing to the point where it can be appealed."

Plaintiffs' counsel agreed, stating, "And we agree that that's the issue that we need to deal with."

After further discussion, the court asked Plaintiffs' counsel to reaffirm that Plaintiffs could not proceed in light of the evidentiary exclusion, which Plaintiffs' counsel reaffirmed, and the court then invited an oral motion to dismiss by Defendants. Defendants moved to dismiss the complaint as to Plaintiffs. Plaintiffs did not oppose the motion. The court granted the motion.

The court filed an order dismissing Plaintiffs' complaint with prejudice in November 2002 and entered judgment for Exxon and Union Oil. Plaintiffs appealed the judgment.

CONTENTIONS

(1) Plaintiffs contend the trial court improperly weighed the evidence and usurped the jury's role as trier of fact. They contend an expert can make reasonable inferences based on the scientific literature available and can evaluate and weigh that information in a way that a lay person cannot. They maintain that Dr. Teitelbaum reached his conclusions by considering all of the materials cited, and that the trial court improperly rejected that approach and required that each individual cited material independently prove causation in order to support Dr. Teitelbaum's conclusions.

(2) Plaintiffs also contend Dr. Teitelbaum's reliance on epidemiological studies involving exposure to multiple solvents was proper because the solvents were all organic solvents, which is the same class of solvents at issue here. Plaintiffs maintain that all organic solvents share similar properties and toxicities and that the purpose of the studies was to draw conclusions about organic solvents as a class. They contend studies involving exposure to multiple solvents are the best information available on the effects of the solvents at issue due to the absence of human toxicology studies and the fact that solvents typically are used in an occupational setting where workers are exposed to multiple solvents and other chemicals. They contend only an expert can determine whether a particular study demonstrates causation and "a judge is unfit to opine in this regard."

Plaintiffs also contend (3) an expert reasonably can rely on an epidemiological study showing a relative risk of less than 2.0 to support an opinion of causation; (4) the court erred by ruling as a matter of law that epidemiological evidence is essential to support an opinion of causation; (5) animal studies together with other materials can support an opinion of causation; (6) case reports together with other materials can support an opinion of causation; (7) the Registry of Toxic Effects of Chemical Substances, treatises, and similar materials together with other materials can support an opinion of causation; (8) the court's analysis of general causation separate and apart from specific causation was prejudicial error and denied Plaintiffs the opportunity to present additional evidence that would establish causation; and (9) by granting Defendants' motion to dismiss the complaint after excluding Dr. Teitelbaum's expert opinion, the court improperly denied Plaintiffs the right to a jury trial without the procedural protections of a noticed summary judgment motion or a motion for nonsuit or directed verdict.

DISCUSSION

1. *The Court Did Not Improperly Weigh the Evidence or Fail to Consider All of the Cited Materials*

As we stated in *Lockheed Litigation Cases*, *supra*, 115 Cal.App.4th at page 563, "An expert opinion may be based on inadmissible matter provided that the matter provides a reasonable basis for the opinion. (Evid. Code, § 801, subd. (b); *People v. Gardeley* (1996) 14 Cal.4th 605, 618 [59 Cal.Rptr.2d 356, 927 P.2d 713]; *Pacific Gas & Electric Co. v. Zuckerman* (1987) 189 Cal.App.3d 1113, 1135-1136 [234 Cal.Rptr. 630].) Evidence Code section 801 states, 'If a witness is testifying as an expert, his testimony in the form of an opinion is limited to such an opinion as is: [¶] . . . [¶] (b) Based on matter (including his special knowledge, skill, experience, training, and education) perceived by or personally known to the witness or made known to him at or before the hearing, whether or not admissible, that is of a type that *reasonably may be relied upon by an expert in forming an opinion upon the subject to which his testimony relates*, unless an expert is precluded by law from using such matter as a basis for his opinion.' (Italics added.)

" 'The value of opinion evidence rests not in the conclusion reached but in the factors considered and the reasoning employed. [Citations.] Where an expert bases his conclusion upon assumptions which are not supported by the record, upon matters which are not reasonably relied upon by other experts, or upon factors which are speculative, remote or conjectural, then his conclusion has no evidentiary value.' (*Pacific Gas & Electric Co. v. Zuckerman*, *supra*, 189 Cal.App.3d at p. 1135.)"

As we also stated in *Lockheed Litigation Cases*, *supra*, 115 Cal.App.4th at page 564, "An expert opinion has no value if its basis is unsound. (*People v. Lawley* (2002) 27 Cal.4th 102, 132 [115 Cal.Rptr.2d 614, 38 P.3d 461]; *People v. Bassett* (1969) 69 Cal.2d 122, 141, 144 [70 Cal.Rptr. 193, 443 P.2d 777].) Matter that provides a reasonable basis for one opinion does not necessarily provide a reasonable basis for another opinion. Evidence Code section 801, subdivision (b), states that a court must determine whether the matter that the expert relies on is of a type that an expert reasonably can rely on 'in forming an opinion *upon the subject to which his testimony relates*.' (Italics added.) We construe this to mean that the matter relied on must provide a reasonable basis for the particular opinion offered, and that an expert opinion based on speculation or conjecture is inadmissible. (*Smith v. ACandS, Inc*. (1994) 31 Cal.App.4th 77, 93 [37 Cal.Rptr.2d 457], disapproved on another point in *Camargo v. Tjaarda Dairy* (2001) 25 Cal.4th 1235, 1245 [108 Cal.Rptr.2d 617, 25 P.3d 1096]; see Cal. Law Revision Com. com., 29B West's Ann. Evid. Code (1995 ed.) foll. § 801, p. 20 ['irrelevant or speculative matters are not a proper basis for an expert's opinion'].)

"A trial court exercises discretion when ruling on the admissibility of expert testimony under Evidence Code section 801, subdivision (b). If the court excludes expert testimony on the ground that there is no reasonable basis for the opinion, we review the exclusion of evidence under the abuse of discretion standard. (*People v. Mickey* (1991) 54 Cal.3d 612, 687-688 [286 Cal.Rptr. 801, 818 P.2d 84]; *People v. Bui* (2001) 86 Cal.App.4th 1187, 1196 [103 Cal.Rptr.2d 908].) To the extent the ruling is based on the trial court's conclusion of law, we review the legal conclusion de novo. (*Penner v. County of Santa Barbara* (1995) 37 Cal.App.4th 1672, 1676 [44 Cal.Rptr.2d 606].)"

An abuse of discretion occurs if, in light of the applicable law and considering all of the relevant circumstances, the court's decision exceeds the bounds of reason and results in a miscarriage of justice. (*Shamblin v. Brattain* (1988) 44 Cal.3d 474, 478-479; *Denham v. Superior Court* (1970) 2 Cal.3d 557, 566; *City of Sacramento v. Drew* (1989) 207 Cal.App.3d 1287, 1297.) The abuse of discretion standard affords considerable deference to the trial court provided that the court acted in accordance with the governing rules of law. " 'The discretion of a trial judge is not a whimsical, uncontrolled power, but a legal discretion, which is subject to the limitations of legal principles governing the subject of its action, and to reversal on appeal where no reasonable basis for the action is shown. [Citation.]' [Citations.]" (*Westside Community for Independent Living, Inc. v. Obledo* (1983) 33 Cal.3d 348, 355.) A decision "that transgresses the confines of the applicable principles of law is outside the scope of discretion" and is an abuse of discretion. (*City of Sacramento*, at p. 1297.) We presume that the court properly applied the law and acted within its discretion unless the appellant affirmatively shows otherwise. (*Denham*, at p. 564; *State Farm Fire & Casualty Co. v. Pietak* (2001) 90 Cal.App.4th 600, 610.)

A court determining whether there is a reasonable basis for an expert opinion under Evidence Code section 801, subdivision (b), must examine the matter that the expert relied on in his forming his or her opinion. This limited analysis involves reviewing the matter relied on and understanding the matter to the extent necessary to determine whether it can provide a reasonable basis ("reasonably may be relied upon" (Evid. Code, § 801, subd. (b))) for the expert's opinion. A court conducting this analysis must not weigh the probative value of the opinion, substitute its own opinion for the expert's opinion, or presume to be an expert. Rather, the analysis is limited to determining whether the matter relied on can provide a reasonable basis for the opinion or, on the other hand, reveals that the opinion is based on a leap of logic, conjecture, or artifice. (See Evid. Code, § 801, subd. (b); *Lockheed Litigation Cases*, *supra*, 115 Cal.App.4th at p. 564.)

Plaintiffs' first contention is based largely on an overly narrow conception of the inquiry and examination by a trial court permissible under Evidence Code section 801, subdivision (b). Plaintiffs have not shown that the court improperly weighed the evidence or usurped the jury's role as trier of fact. Rather, the record shows that as pertinent to our decision the court carefully heeded the legal limitations on its role in determining whether Dr. Teitelbaum's opinion was based on matter that provides a reasonable basis for his opinion. We address Plaintiffs' more specific contentions of legal error in subsequent sections of this opinion.

We conclude further that the court properly considered the materials cited both individually and collectively. In its final ruling excluding expert testimony, the court first discussed each individual category of materials--epidemiological studies, animal studies, case reports, and other materials--with a view to determining whether each category of materials provided any support for an opinion of causation. The court determined that each category of materials provided either no support for Dr. Teitelbaum's opinion or only weak support for his opinion, as discussed in further detail *post*. The court then determined whether the materials collectively provided a reasonable basis for Dr. Teitelbaum's opinion with respect to each chemical at issue and each illness, and determined that they did not. We find no error in this approach. We consider the court's conclusions with regards to particular materials *post*.

Plaintiffs contend *Roberti v. Andy's Termite & Pest Control, Inc.* (2003) 113 Cal.App.4th 893 compels the conclusion that the trial court exceeded its authority under Evidence Code section 801, subdivision (b). We disagree. The trial court in *Roberti* excluded the plaintiffs' experts' testimony on causation by expressly applying the test from *People v. Kelly* (1976) 17 Cal.3d 24. (*Roberti*, at pp. 898-899.) The defendant argued on appeal that (1) the trial court properly applied the *Kelly* test, and (2) even if *Kelly* did not apply, the exclusion was proper because the opinions "were based on unreliable foundational matters, or upon no foundation at all." (*Roberti*, at p. 899.) The Court of Appeal in *Roberti* construed the defendants' second contention as an argument to "apply the foundational analysis employed in the federal courts to all expert

testimony" (*id*. at p. 904) or "under the guise of determining whether the challenged testimony was supported by the proper foundation, [to] conduct a *Daubert*-style analysis" (*id*. at p. 905). *Roberti* held that (1) the *Kelly* test applies only to new scientific techniques and therefore did not apply to the plaintiffs' experts' opinions (*Roberti*, at pp. 899-904), and (2) the "*Daubert* threshold reliability test" (*id*. at p. 905) does not apply in California (*id*. at pp. 904-906). *Roberti* also declined to apply a "*Daubert*-style analysis" (*id*. at p. 905) or a "more extensive preliminary admissibility test as in *Daubert*" (*id*. at p. 906). *Roberti* therefore concluded that the exclusion of evidence was error. (*Ibid*.)

Roberti v. Andy's Termite & Pest Control, Inc., *supra*, 113 Cal.App.4th 893 did not focus on Evidence Code section 801, subdivision (b), or explain what the statute requires. *Roberti* quoted language from *People v. Mitchell* (2003) 110 Cal.App.4th 772, 784, citing the statute and rejected what the *Roberti* court apparently viewed as a suggestion in *Mitchell* that section 801, subdivision (b), authorizes the application of "a more extensive preliminary admissibility test as in *Daubert* to expert medical opinion concerning causation." (*Roberti*, at p. 906.) *Roberti* concluded that the plaintiffs' expert testimony was relevant (Evid. Code, § 210) and satisfied section 801, subdivision (b), stating in the language of the statutes, "The testimony offered by plaintiff's experts in this case both had the tendency in reason to prove causation, and was based on studies and protocol of a type that reasonably may be relied upon by a medical expert witness." (*Roberti*, at p. 906.) *Roberti* offers no guidance as to what section 801, subdivision (b), requires short of a "*Daubert*-style analysis."

2. *The Court Did Not Err by Concluding that the Multiple-solvent Epidemiological Studies Failed to Provide a Reasonable Basis for Dr. Teitelbaum's Opinion*

a. *Law of Causation*

A defendant's conduct was a legal cause of the plaintiff's injury only if the conduct was a substantial factor in bringing about the injury and there is no rule of law relieving the defendant of liability. (*Ortega v. Kmart Corp.* (2001) 26 Cal.4th 1200, 1205.) Conduct that was only a "very minor" contribution to bringing about the

plaintiff's injury constitutes a substantial factor unless the contribution was so minor as to be "negligible," " ' "theoretical," ' " or " ' "infinitesimal." ' " (*Bockrath v. Aldrich Chemical Co.* (1999) 21 Cal.4th 71, 79.) The substantial factor test subsumes the "but for" test of causation. (*Viner v. Sweet* (2003) 30 Cal.4th 1232, 1240.)

In a toxic tort case, a plaintiff must present expert testimony sufficient to establish to a reasonable medical probability that the defendant's conduct contributed to the plaintiff's injury. (*Bockrath v. Aldrich Chemical Co.*, *supra*, 21 Cal.4th at p. 79.) A reasonable medical probability is more than a mere possibility. A reasonable medical probability exists only if it is more likely than not that the defendant's conduct contributed to the plaintiff's injury. (*Jones v. Ortho Pharmaceutical Corp.* (1985) 163 Cal.App.3d 396, 402-403; cf. *Saelzler v. Advanced Group 400* (2001) 25 Cal.4th 763, 775-776; see *Rutherford v. Owens-Illinois, Inc.* (1997) 16 Cal.4th 953, 976, fn. 11.)

b. *Plaintiffs Have Not Shown Error*

The epidemiological studies that Dr. Teitelbaum relied on all involved exposure to multiple solvents, including solvents that are not at issue here. The court concluded that the multiple-solvent epidemiological studies showing an association between exposure to multiple solvents and various ailments did not support the conclusion that any one of the solvents at issue here can cause a disease. We conclude that the court's conclusion was sound.

The epidemiological studies showed that persons exposed to many solvents suffered a greater incidence of disease than persons not exposed. The studies did not indicate, however, whether persons exposed to only the solvents at issue here suffered a greater incidence of disease than persons not exposed. We conclude that the multiple-solvent studies provide no reasonable basis for an opinion that any of the solvents here at issue can cause disease. (*Lockheed Litigation Cases*, *supra*, 115 Cal.App.4th at pp. 564-565.)

Plaintiffs explain Dr. Teitelbaum's reliance on multiple-solvent epidemiological studies by arguing that organic solvents all "share similar chemical properties and toxicities." Plaintiffs construe language in a published report of a scientific workshop on

exposure issues, which was included in the materials that Dr. Teitelbaum relied on, to mean that "solvents have shared properties and are similarly acting substances." Dr. Teitelbaum did not state in his declarations or oral testimony that the chemicals at issue here are sufficiently similar to other organic solvents that scientific studies of other organic solvents can support an opinion of causation with regard to these individual chemicals. Our review of the trial court's ruling is limited to the record before the trial court, including Dr. Teitelbaum's testimony and the materials on which he relied to support his opinion. We consider those materials only to determine whether the court abused its discretion by deciding that the materials provide no reasonable basis for Dr. Teitelbaum's opinion. Plaintiffs cannot supplement Dr. Teitelbaum's opinion on scientific matters with opinion by their counsel on scientific matters, and Plaintiffs did not offer a qualified expert opinion on this issue in the trial court.

3. *An Expert Reasonably Can Rely on an Epidemiological Study Showing a Relative Risk of Less than 2.0*

Plaintiffs contend an expert reasonably can rely on an epidemiological study showing a relative risk of less than 2.0 in forming an opinion of causation, and the trial court's ruling to the contrary was error. We agree but conclude that the error was not prejudicial.

Epidemiology is "the study of the distribution and determinants of disease frequency in man." (Rothman & Greenland, Modern Epidemiology (2d ed. 1998) p. 29.) It may also be defined as "the study of the occurrence of illness." (*Ibid*.) There are several types of epidemiological studies and various ways to express and analyze the data. A cohort study measures and compares the incidence of disease in a group of persons exposed to a particular agent with the incidence of disease in an unexposed group. (*Id*. at p. 73; Green et al., *Reference Guide on Epidemiology* in Reference Manual on Scientific Evidence (Fed. Jud. Center 2d ed. 2000) p. 340.) The association between exposure to an agent and a disease can be expressed numerically as a ratio commonly known as relative risk. Relative risk is, generally, the incidence of disease in a group of exposed persons divided by the incidence of disease in a group of unexposed persons.

(Rothman, Epidemiology: An Introduction (2002) pp. 24-25, 52-53; Green et al., *Reference Guide on Epidemiology*, *supra*, p. 348.) A relative risk of 2.0 indicates that the disease was twice as common in the exposed subjects as in the unexposed subjects. (Green et al., *Reference Guide on Epidemiology*, *supra*, at p. 349.) Relative risk expresses the degree of association between exposure and disease. (*Id*. at p. 348.) An association does not necessarily indicate a causal effect. (*Id.* at pp. 336-337 & fn. 8.)

The trial court concluded that an expert can rely on an epidemiological study in forming an opinion that an agent is capable of causing a disease only if the study shows a relative risk of at least 2.0. The court reasoned that it is more likely than not that exposure to an agent caused a disease only if the incidence of disease in exposed persons was more than twice the incidence in unexposed persons. The court relied primarily on *Jones v. Ortho Pharmaceutical Corp.*, *supra*, 163 Cal.App.3d 396, and *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (9th Cir. 1995) 43 F.3d 1311 (*Daubert II*). The court suggested that the fact that the studies showed relative risks of less than 2.0 was a sufficient reason to exclude the studies from consideration in determining whether there was a reasonable basis for Dr. Teitelbaum's opinion. This was tantamount to ruling that the studies were irrelevant. We note that the court also concluded that the studies provided no support for Dr. Teitelbaum's opinion for another reason, discussed *ante*.

We conclude that *Jones v. Ortho Pharmaceutical Corp.*, *supra*, 163 Cal.App.3d 396, and *Daubert II*, *supra*, 43 F.3d 1311, are distinguishable and do not support the proposition that a California court can exclude an epidemiological study from consideration in determining whether there is a reasonable basis for an expert opinion solely because the study shows a relative risk of less than 2.0. We express no opinion as to whether an expert opinion based solely on an epidemiological study showing a relative risk of less than 2.0 can be sufficient to support a finding of causation.

As we shall explain further, both *Jones* and *Daubert II* involved dispositive motions in which the plaintiffs had the opportunity to present all of their evidence on causation but failed to present evidence sufficient to permit a reasonable trier of fact to find that it was more likely than not that the defendants' products caused the plaintiffs'

injuries. The plaintiffs' experts in *Daubert II* relied exclusively on epidemiological studies showing a relative risk of less than 2.0 to establish causation and made no effort to show that the plaintiffs' risk of injury was greater than that of the study subjects. The plaintiffs' experts in *Jones* and *Daubert II* did not opine that causation was more likely than not, but only that causation was a possibility. *Jones* and *Daubert II* concluded that the experts' opinions were insufficient to support a verdict in the plaintiffs' favor, not that the matter relied on provided no reasonable basis for the experts' opinions. Moreover, *Jones* and *Daubert II* did not hold or suggest that an expert cannot rely on an epidemiological study showing a relative risk of less than 2.0 together with other matters in forming an opinion of causation.

Jones v. Ortho Pharmaceutical Corp., *supra*, 163 Cal.App.3d at pages 402 to 404, held that the plaintiff's expert testimony was insufficient to support a finding that the plaintiff's use of oral contraceptives for six months caused her disease because the experts did not opine that causation was more likely than not, but only that causation was a possibility. The experts relied on a study that showed a "statistically significant increase" in the progress of the disease after five or six years of continuous use of oral contraceptives, but showed no significant increase after only a short period of use. The experts also testified that other risk factors could contribute to the onset of disease, but the plaintiff denied that those risk factors were present. (*Id*. at p. 401.) The *Jones* court concluded that absent an expert opinion that the use of contraceptives more likely than not caused the plaintiff's injuries, the jury could not reasonably conclude that it was more likely than not that the use of contraceptives caused the plaintiff's injuries. (*Id*. at pp. 403-404.) The court therefore affirmed a judgment of nonsuit. (*Id*. at p. 406.)

Jones v. Ortho Pharmaceutical Corp., *supra*, 163 Cal.App.3d 396, did not involve the question of admissibility of expert testimony. Rather, *Jones* held that the plaintiff's expert testimony admitted in evidence was insufficient to support a judgment in her favor, and affirmed a nonsuit. (*Jones*, at pp. 403-404.) *Jones* held that the plaintiff must establish causation to a reasonable medical probability based on competent expert testimony stating that it was more likely than not that the defendant's product caused the

plaintiff's injury. (*Id*. at pp. 402-403.) *Jones* did not conclude that the expert testimony was inadmissible or that the studies did not provide a reasonable basis for the expert opinions, but only that the opinions were insufficient to support a verdict. (*Id*. at pp. 403-404.)

Daubert II, *supra*, 43 F.3d at page 1322, held that the trial court properly excluded the plaintiffs' expert testimony and affirmed a summary judgment for the defendant. *Daubert II* concerned the admissibility of expert testimony under rule 702 of the Federal Rules of Evidence (28 U.S.C.) and *Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1993) 509 U.S. 579 [113 S.Ct. 2786] (*Daubert*). (*Daubert II*, at pp. 1315-1317.) The United States Supreme Court in *Daubert* held that to be admissible under rule 702, scientific expert testimony must be reliable and relevant. That is, it must (1) reflect " 'scientific knowledge,' " meaning that the assertion must be derived by the scientific method and "supported by appropriate validation . . . based on what is known," and (2) " 'assist the trier of fact to understand the evidence . . . or to determine a fact in issue.' " (*Daubert,* at pp. 589-591.) The Ninth Circuit in *Daubert II* construed the second requirement in *Daubert* to mean that a federal judge must exclude scientific expert testimony unless the judge is "convinced that it speaks clearly and directly to an issue in dispute in the case, and that it will not mislead the jury." (*Daubert II*, at p. 1321, fn. 17.)

The Ninth Circuit in *Daubert II* looked to the substantive law of the forum state, California, to determine whether the expert testimony on causation would assist the trier of fact. The court concluded that the plaintiffs must show that it was more likely than not that their mothers' use of Bendectin caused the plaintiffs' birth defects, citing *Jones v. Ortho Pharmaceutical Corp.*, *supra*, 163 Cal.App.3d at page 403. (*Daubert II*, *supra*, 43 F.3d at p. 1320.) The court therefore concluded that the plaintiffs must show not only that the use of Bendectin increased the likelihood of birth defects, but that it more than doubled the risk. (*Id.* at pp. 1320-1321.) *Daubert II* stated, "For an epidemiological study to show causation under a preponderance standard, 'the relative risk . . . arising from the epidemiological data . . . will, at a minimum, have to exceed "2".' (*Deluca* [*v. Merrell Dow Pharmaceuticals, Inc*.] [(3d Cir. 1990)] 911 F.2d [941,] 958.) [Fn.

omitted.]" (*Daubert II*, at p. 1321.) The epidemiological studies did not show a relative risk of greater than 2.0, and the plaintiffs' experts did not opine that use of Bendectin during pregnancy more than doubled the risk of birth defects, so the Ninth Circuit concluded that the expert testimony was insufficient to support a verdict in the plaintiffs' favor. The court therefore concluded that the expert testimony would not assist the trier of fact and was inadmissible. (*Id*. at pp. 1321-1322.)

Daubert II noted that an epidemiological study showing a relative risk of less than 2.0 could be combined with other evidence to show that causation was more likely than not. Since the plaintiffs' experts did not attempt to show that the plaintiffs' risk of injury was greater than that of the study subjects, however, the court concluded that the studies "must therefore stand or fall on their own." (*Daubert II*, *supra*, 43 F.3d at p. 1321, fn. 16.) *Daubert II* therefore supports the proposition that an epidemiological study showing a relative risk of less than 2.0 can play a part in providing a reasonable basis for an opinion of causation when considered together with other matters.

In this case, since there was an independent ground for the court to conclude that the epidemiological studies provided no support for Dr. Teitelbaum's opinions, as discussed *ante*, to the extent the trial court ruled that Dr. Teitelbaum's testimony was inadmissible because the studies that he relied on did not show a relative risk of 2.0 or greater, that ruling was not prejudicial.

A question we need not decide is in what circumstances an expert opinion based on an epidemiological study can be sufficient to support a finding of causation. Some courts have stated that an expert opinion based on an epidemiological study can be sufficient to support a finding of causation only if the study shows a relative risk of more than 2.0. (E.g., *Daubert II*, *supra*, 43 F.3d at pp. 1320-1322; *DeLuca v. Merrell Dow Pharmaceuticals, Inc., supra,* 911 F.2d at pp. 958-959; *Hall v. Baxter Healthcare Corp*. (D.Or. 1996) 947 F.Supp. 1387, 1403; *Merrell Dow Pharmaceuticals v. Havner* (Tex. 1997) 953 S.W.2d 706, 717-718; see cases cited in Green et al., *Reference Guide on Epidemiology* in Reference Manual on Scientific Evidence, *supra*, at p. 384, fn. 140.) Those courts generally recognize an exception if the expert also relies on other factors to

show that the plaintiff's risk of injury was greater than that of the study subjects or relies on other matters to support the conclusion that causation was more likely than not. (E.g., *Daubert II*, at p. 1321, fn. 16; *DeLuca*, at p. 959; *Hall*, at p. 1404; see *Havner*, at pp. 718-719.) In other opinions, however, courts to varying degrees have eschewed the use of a numerical relative risk requirement with regard to the substances and diseases there at issue. (E.g., *In re Hanford Nuclear Reservation Litigation* (9th Cir. 2002) 292 F.3d 1124, 1137; *In re Joint Eastern & Southern Dist. Asbestos Lit.* (2d Cir. 1995) 52 F.3d 1124, 1134; *Allen v. United States* (D.Utah 1984) 588 F.Supp. 247, 418-419, revd. on another ground (10th Cir. 1987) 816 F.2d 1417.) Commentary on the subject is extensive.[3] We need not decide these and other questions raised by the imposition of a numerical relative risk requirement. We merely conclude that in determining whether there is a reasonable basis for an expert opinion under Evidence Code section 801, subdivision (b), a court cannot exclude an epidemiological study from consideration solely because the study shows a relative risk of less than 2.0.

4. *The Court Did Not Rule as a Matter of Law that Epidemiological Evidence Is Essential to Establish Causation*

Plaintiffs contend the court ruled as a matter of law that epidemiological evidence is essential to support an opinion of causation and contend the ruling was error. We

---

[3] Some of the more noteworthy articles include Black and Lilienfeld, *Epidemiologic Proof in Toxic Tort Litigation* (1984) 52 Fordham L.Rev. 732; Gold, *Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence* (1986) 96 Yale L.J. 376; Green, *Expert Witnesses and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of Agent Orange and Bendectin Litigation* (1992) 86 Nw.U. L.Rev. 643; Cranor et al., *Judicial Boundary Drawing and the Need for Context-Sensitive Science in Toxic Torts after Daubert v. Merrell Dow Pharmaceuticals, Inc.* (1996) 16 Va. Envtl. L.J. 1; Finley, *Guarding the Gate to the Courthouse: How Trial Judges Are Using Their Evidentiary Screening Role to Remake Tort Causation Rules* (1999) 49 DePaul L.Rev. 335; Carruth & Goldstein, *Relative Risk Greater than Two in Proof of Causation in Toxic Tort Litigation* (2001) 41 Jurimetrics J. 195; Beyea and Berger, *Complex Litigation at the Millennium: Scientific Misconceptions Among Daubert Gatekeepers: the Need for Reform of Expert Review Procedures* (2001) 64 Law & Contemp. Probs. 327, 349-357.

conclude that Plaintiffs have not affirmatively shown that the court so ruled and therefore have not overcome the presumption in favor of the judgment. (*Denham v. Superior Court*, *supra*, 2 Cal.3d at p. 564.)

The court stated in the introduction to its tentative ruling that it was ruling as a matter of law that "[u]nder California law, a plaintiff must use human epidemiological evidence to establish causation." The court stated later in the tentative ruling that epidemiology is the most common method used to prove causation and that an expert reasonably can rely on an epidemiological study to support an opinion of causation only if the study shows a relative risk of greater than 2.0. The court, however, did not restate or explain its conclusion that epidemiological evidence is essential to establish causation. Moreover, in the tentative ruling the court examined all of the materials that Dr. Teitelbaum relied on even after determining that the epidemiological studies provided no reasonable basis for his opinions. The court identified several shortcomings in the other materials and determined that the materials collectively did not support Dr. Teitelbaum's opinion. Plaintiffs did not request clarification of the tentative ruling.

The court stated in its final order excluding expert testimony that one of the issues presented was "whether epidemiological evidence that demonstrates at least a twofold increase in the risk of disease is necessary to establish exposure to a particular chemical caused the disease." The order did not discuss or answer that question, however. The court concluded that an epidemiological study must show a relative risk of 2.0 or more for an expert to rely on the study in forming an opinion of causation. As in the tentative ruling, the court examined all of the materials that Dr. Teitelbaum relied on even after determining that the epidemiological studies provided no reasonable basis for his opinions. The court identified several shortcomings in the other materials and determined that the materials collectively did not support Dr. Teitelbaum's opinion. Plaintiffs did not request clarification of the order.

Plaintiffs stated on at least two occasions after the order excluding expert testimony that Dr. Teitelbaum's testimony was essential to their case and that they could not proceed without it. They did not state that they could not proceed because of the

court's purported ruling that epidemiological evidence is essential to establish causation as a matter of law or intimate in any way that that was what they believed the court's ruling to be. Rather, Plaintiffs conceded the dismissal of their complaint based on the absence of sufficient evidence of causation apart from Dr. Teitelbaum's testimony.

We conclude that the court did not rule as a matter of law that epidemiological evidence is essential to establish causation or that an expert must rely on an epidemiological study to support an opinion of causation. Moreover, Plaintiffs have not shown that the court effectively prevented them from presenting additional evidence of causation or that it would have been futile for them to do so. We therefore need not decide whether an expert must rely on an epidemiological study to support an opinion of causation.

5. *Plaintiffs Have Not Shown Prejudicial Error in the Ruling that the Animal Studies, Case Reports, Toxics Registry, and Other Materials Cannot Reasonably Support an Opinion of Causation in this Case*

a. *Animal Studies*

The court in its tentative ruling noted several shortcomings in Dr. Teitelbaum's reliance on animal studies, including his failure to explain the significance of differences between human beings and the animals studied (species extrapolation) and his failure to explain how to extrapolate from the high doses given to animals to the lower doses to which human beings may be subjected (dosage extrapolation). The court stated in its tentative ruling that absent further explanation Dr. Teitelbaum's reliance on animal studies was unreasonable. The court offered the parties the opportunity to present additional evidence on the extrapolation issues. Plaintiffs declined the opportunity. The court therefore concluded in its final order excluding expert testimony that Dr. Teitelbaum could not reasonably rely on the animal studies.

On appeal, Plaintiffs do not attempt to explain why the animal studies that Dr. Teitelbaum relied on are probative of causation in human beings. Instead, they argue categorically that animal studies generally are reliable for this purpose, particularly when combined with other evidence.

An animal study may or may not provide reasonably reliable support for an opinion on causation in human beings. Differences between human beings and other species, including differences in absorption, distribution, and metabolism of substances, may affect toxicity. (Goldstein & Henifin, *Reference Guide on Toxicology* in Reference Manual on Scientific Evidence, *supra*, p. 419.) The high doses typically used in animal experiments compared with the much lower levels to which human beings typically may be exposed make it necessary to consider the relationship between dose and response, the shape of the dose-response curve at lower levels of exposure, and the possibility that exposure may not cause a disease when the exposure is below a threshold level. (*Id*. at pp. 409, 410; Green et al., *Reference Guide on Epidemiology* in Reference Manual on Scientific Evidence, *supra*, p. 377 & fn. 119; 2 Searcy-Alford, A Guide to Toxic Torts (2004) § 10.02[6][b], pp. 10-47 to 10-48.) In light of these concerns, reliance on a particular animal study may be unwarranted. To justify reliance on a particular animal study, an expert should explain why reliance is warranted.

Plaintiffs have not shown that Dr. Teitelbaum adequately explained why his reliance on the animal studies was warranted and do not explain why his reliance on the animal studies on which he relied was warranted. Plaintiffs therefore have not shown error in the court's conclusion that the animal studies provide no reasonable basis to support Dr. Teitelbaum's opinion.

b. *Case Reports*

The court stated in the order excluding expert testimony that case reports are of little value in determining causation and concluded that the case reports on which Dr. Teitelbaum relied together with the other materials on which his opinion was based provided no reasonable basis for his opinion.

A case report is a published report of an illness experienced by a patient or a small number of patients. Case reports are not controlled studies and frequently contain little or no analysis. The primary utility of case reports ordinarily is to suggest a hypothesis concerning association or causation, not to reach a conclusion. (Henifin et al., *Reference Guide on Medical Testimony* in Reference Manual on Scientific Evidence, *supra*, at

pp. 474-475; *Glastetter v. Novartis Pharmaceuticals Corp.* (8th Cir. 2001) 252 F.3d 986, 989-990.) "Causal attribution based on case studies must be regarded with caution. However, such studies may be carefully considered in light of other information available . . . ." (Henifin et al., *Reference Guide on Medical Testimony*, *supra*, at p. 475.)

Plaintiffs have not shown that the court refused to consider the case reports because they did not independently prove causation or ruled that case reports together with other materials cannot support an opinion of causation. Rather, as stated *ante*, the court expressly considered the case reports and other materials that Dr. Teitelbaum relied on and determined that the case reports were of little value and that the case reports together with other materials failed to provide a reasonable basis for Dr. Teitelbaum's opinion. Plaintiffs do not attempt to explain why the case reports that Dr. Teitelbaum relied on are probative, particularly in light of the paucity of other support for his opinion, and have not shown an abuse of discretion in the court's decision.

c. *Toxics Registry and Other Materials*

The court stated in the order excluding expert testimony that the Registry of Toxic Effects of Chemical Substances, treatises, information cards, and similar materials did not provide data supporting their statements, that they sometimes did not distinguish permanent from transitory injuries, that they sometimes listed the adverse effects as only possible, that some of the materials included disclaimers stating that the authors had not evaluated the toxicity data, and that some of the materials did not disclose what degree of association they required before listing an adverse effect. The court therefore concluded that Dr. Teitelbaum could not reasonably rely on those materials.

Plaintiffs argue that toxics registries and treatises are generally accepted summaries of the toxic effects of substances, that they are published by reputable sources, and that together with other materials they can support an opinion of causation. Aside from those broad statements, however, Plaintiffs do not attempt to explain why the toxics registries, treatises, and similar materials that Dr. Teitelbaum relied on are probative, particularly in light of the court's expressed concerns and the paucity of other support for Dr. Teitelbaum's opinion. We have reviewed the pages from the Registry of Toxic

Effects of Chemical Substances and other materials referenced by Plaintiffs' counsel in oral argument and conclude that Plaintiffs have not overcome these shortcomings. Plaintiffs have not shown an abuse of discretion.

6. *Plaintiffs Have Not Shown Error with Respect to the Court's Separate Consideration of General Causation*[*]

Causation encompasses both general and specific causation. General, or generic, causation refers to whether a substance is capable of causing a particular injury. Specific, or individual, causation refers to whether a substance caused a particular plaintiff's injury. (Green et al., *Reference Guide on Epidemiology* in Reference Manual on Scientific Evidence, *supra*, at pp. 336, 381-382; *In re Hanford Nuclear Reservation Litigation*, *supra*, 292 F.3d at p. 1133.) Any inquiry into causation necessarily involves consideration of both general and specific causation. In complex toxic tort litigation, general causation often is in dispute.

Plaintiffs offer several arguments against the court's analysis of general causation separate and apart from specific causation. None has merit. Plaintiffs argue that the court purported to exclude Dr. Teitelbaum's testimony with respect to general causation but actually concluded that he failed to establish specific causation. Plaintiffs rely on their construction of language in the order excluding expert testimony in which the court appeared to equate specific causation with "legal causation." That language does not detract from the fact that Dr. Teitelbaum's opinion addressed only general causation or from our conclusion that the court properly determined that Dr. Teitelbaum's opinion was based on matter that provided no reasonable basis for his opinion.

Plaintiffs also argue that the reasonable medical probability standard applies only to specific causation and that they can prove general causation by a lesser showing. We disagree. In the context of a personal injury action, evidence establishes a reasonable probability of causation only if the trier of fact reasonably can conclude that it is more likely than not that the defendant's conduct contributed to the plaintiff's injury. (*Saelzler*

---

[*] See footnote, *ante*, page 1.

v. Advanced Group 400, *supra*, 25 Cal.4th at pp. 775-776; *Jones v. Ortho Pharmaceutical Corp*., *supra*, 163 Cal.App.3d at p. 403.) " 'The plaintiff must introduce evidence which affords a reasonable basis for the conclusion that it is more likely than not that the conduct of the defendant was a cause in fact of the result. A mere possibility of such causation is not enough; and when the matter remains one of pure speculation or conjecture, or the probabilities are at best evenly balanced, it becomes the duty of the court to direct a verdict for the defendant.' (Prosser & Keeton, Torts (5th ed. 1984) § 41, p. 269, fns. omitted.)" (*Ortega v. Kmart Corp*., *supra*, 26 Cal.4th at pp. 1205-1206.) This is in accordance with the ordinary standard of proof in a civil action of a preponderance of the evidence. (Evid. Code, §§ 115, 190.) The reference to "medical probability" merely reflects the recognition that when the cause of injury is uncertain causation must be proved by medical expert testimony. (*Rutherford v. Owens-Illinois, Inc*., *supra*, 16 Cal.4th at pp. 976-977, fn. 11.) The preponderance of the evidence standard applies to all facts that a plaintiff seeks to prove in a civil action absent an exception to the general rule, which Plaintiffs have not shown. (Evid. Code, § 115; *Weiner v. Fleischman* (1991) 54 Cal.3d 476, 483.) We therefore conclude that a plaintiff must establish the fact of causation by a reasonable medical probability and that this standard applies to both general and specific causation.

Plaintiffs also maintain that by limiting the hearing on the admissibility of expert testimony to the question of general causation the court prevented them from presenting evidence of specific causation. They maintain that they "never had the chance to offer any expert testimony or evidence on the question of specific causation." The record refutes this. Plaintiffs never sought to introduce additional evidence of causation after the exclusion of Dr. Teitelbaum's testimony, and have not shown that the court prevented them from doing so. Instead, Plaintiffs stated to the court on at least two occasions that Dr. Teitelbaum's testimony was essential to their case and that they could not proceed without it. They sought a means to obtain a prompt dismissal and did not oppose Defendants' motion to dismiss. Having failed to present evidence of specific causation,

Plaintiffs cannot argue on appeal that the trial court erred by failing to consider their evidence of specific causation.

7. *Plaintiffs Invited and Waived Any Error With Respect to the Dismissal*

Plaintiffs argue that the court improperly denied them the right to a trial by jury by granting an oral motion to dismiss without allowing them the procedural protections of a noticed summary judgment motion or a motion for nonsuit or directed verdict.

The doctrine of invited error prevents a party from asserting an alleged error as grounds for reversal when the party induced the commission of error through its own conduct. (*Norgart v. Upjohn Co.* (1999) 21 Cal.4th 383, 403.) The doctrine of waiver ordinarily prevents a party from arguing for the first time on appeal questions that were not presented to the trial court. (*In re Riva M.* (1991) 235 Cal.App.3d 403, 411-412.)

Plaintiffs requested entry of an appealable order or judgment after the exclusion of Dr. Teitelbaum's testimony, asked the court to dismiss the complaint on its own motion, expressed no objection to the procedure used by the court of granting Defendants' oral motion to dismiss, and offered no additional evidence or argument to avoid dismissal. We conclude that Plaintiffs invited any error by proposing a dismissal and waived any error by failing to object to the dismissal procedure or make an offer of proof.

Plaintiffs recast this argument in their reply brief by arguing that the court denied them the right to a trial by jury by weighing the evidence of causation in ruling on the admissibility of Dr. Teitelbaum's opinion. Plaintiffs do not challenge the court's authority to determine before trial the admissibility of their expert's opinion, but argue that in ruling on admissibility the court improperly evaluated the merits of the materials supporting Dr. Teitelbaum's opinion. We conclude that the court properly determined that the materials that Dr. Teitelbaum relied on provided no reasonable basis for his opinion and did not improperly weigh the evidence, as stated *ante*.

DISPOSITION

The judgment is affirmed. Exxon and Union Oil are entitled to costs on appeal.

CERTIFIED FOR PARTIAL PUBLICATION

KITCHING, J.

We concur:

CROSKEY, Acting P.J.

MALLANO, J.[*]

[*] Associate Justice of the Court of Appeal, Second Appellate District, Division One, assigned by the Chief Justice pursuant to article VI, section 6 of the California Constitution.