

[PUBLISH]

IN THE UNITED STATES COURT OF APPEALS

FOR THE ELEVENTH CIRCUIT

No. 03-15413

FILED
U.S. COURT OF APPEALS
ELEVENTH CIRCUIT
July 08, 2005
THOMAS K. KAHN
CLERK

D. C. Docket No. 02-00185-CR-1-CB-002

UNITED STATES OF AMERICA,

Plaintiff-Appellee,

versus

RONALD KEITH BROWN,

Defendants-Appellants.

No. 03-15459

D. C. Docket No. 02-00185-CR-1-CB-001

UNITED STATES OF AMERICA,

Plaintiff-Appellee,

versus

KEVIN LAYNE BROWN,

Defendants-Appellants.

Appeals from the United States District Court
for the Southern District of Alabama

(July 8, 2005)

Before ANDERSON, CARNES and RONEY, Circuit Judges.

CARNES, Circuit Judge:

Two brothers, Ronald and Kevin Brown, were convicted of conspiracy to distribute 1,4-butanediol, an alleged controlled substance analogue, in violation of 21 U.S.C. § 846. Whether the chemical structure of that substance is “substantially similar” to the chemical structure of the schedule I controlled substance gamma hydroxybutyric acid (GHB), such that it is a “controlled substance analogue” as defined by 21 U.S.C. § 802(32)(A), was the key question at trial and it is the key question in this appeal.

The Browns have brought us a number of contentions arising from the dispute over whether 1,4-butanediol is substantially similar to GHB. Some of them involve Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786 (1993), and question the district court’s rulings on the admission of expert testimony. The others involve whether the evidence was sufficient to convict the Browns and whether the analogue theory embodied in 21 U.S.C. §§ 802(32)(A)

and 813 is unconstitutional.

I.

A.

Ronald and Kevin Brown owned and operated two Internet websites that advertised and sold products for human consumption containing varying amounts of 1,4-butanediol, an industrial solvent that in recent years has been found to be a depressant and can be used as a “date rape” drug. Over a two-year period, FBI agents used an undercover e-mail account to purchase from the Browns approximately 23.5 gallons of products containing 1,4-butanediol. Then, in conjunction with a nationwide operation coordinated by the Department of Justice, law enforcement officers executed search warrants for the Browns’ residences and another house where the drugs were thought to be kept. They found 200 gallons of 1,4-butanediol, some pure and some diluted, as well as handwritten notes and recipes for preparing 1,4-butanediol products.

An indictment was returned charging the Browns with one count of conspiracy to distribute and possess with intent to distribute 1,4-butanediol, and with eight counts of distribution and possession with intent to distribute 1,4-butanediol, in violation of 21 U.S.C. §§ 841(a)(1), 813, and 846.

The parties entered into a joint bench trial agreement under which the

government dropped the eight possession counts against the Browns. In place of the indictment, the government filed a superseding information charging the Browns with conspiracy to distribute and possess with intent to distribute 1,4-butanediol. The government also sought criminal forfeiture of the Browns' property. The Browns agreed to stipulate to all the facts except the central one of whether the chemical structure of 1,4-butanediol is "substantially similar" to the chemical structure of GHB so as to bring the chemical compound within the definition of "controlled substance analogue" under 21 U.S.C. § 802(32)(A). That one factual issue was left for trial.

In a subsequent joint amendment to the agreement, the Browns waived their right to appeal any resulting conviction and sentence, except as to certain specified issues. The relevant excepted issues for present purposes are whether 1,4-butanediol is substantially similar to GHB as defined by § 802(32)(A)(i), and those additional issues arising from "any rulings by the district court addressing that issue."

B.

The government's position throughout this prosecution has been that, pursuant to 21 U.S.C. § 802(32)(A), 1,4-butanediol is a "controlled substance analogue" of GHB, which Congress added to the statutory list of schedule I

controlled substances in 2000. See Hillory J. Farias and Samantha Reid Date-Rape Drug Prohibition Act of 2000, Pub. L. No. 106-172, § 3(a), 114 Stat. 7. Under the Controlled Substance Analogue Enforcement Act of 1986 (“the Analogue Act”), 21 U.S.C. §§ 802 and 813, some chemical compounds that are not themselves listed as schedule I controlled substances are termed “controlled substance analogue[s]” and treated as though they were schedule I substances. Id. § 813 (“A controlled substance analogue shall, to the extent intended for human consumption, be treated, for the purposes of any Federal law as a controlled substance in schedule I.”). The Analogue Act defines a “controlled substance analogue” as a substance:

(i) the chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II;

(ii) which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II; or

(iii) with respect to a particular person, which such person represents or intends to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II.

Id. § 802(32)(A).

We have never decided whether § 802(32)(A) should be read disjunctively

or conjunctively. The district court concluded that most courts “have read the statute in the conjunctive which requires the government to prove clause (i) and either clause (ii) or (iii).” United States v. Brown, 279 F. Supp. 2d 1238, 1240 (S.D. Ala. 2003) (citation omitted); accord United States v. Turcotte, 405 F.3d 515, 522–23 (7th Cir. 2005). Because both parties accept the district court’s conjunctive reading of the statute, we will assume for purposes of this appeal that it is the correct one.

The Browns have conceded all along that 1,4-butanediol has the same effect on a person’s central nervous system as GHB and thereby meets clause (ii) of § 802(32)(A). In fact, they stipulated in the district court that when ingested 1,4-butanediol is actually transformed into GHB by two naturally occurring enzymes. That leaves only the question of whether 1,4-butanediol meets clause (i). The government says it does; the Browns say it does not.

C.

During the three-day bench trial the government put on two witnesses and the defense put on one. All three of the witnesses testified on the § 802(32)(A)(i) issue: whether the chemical structure of 1,4-butanediol is “substantially similar” to that of GHB.

The government called Dr. James DeFrancesco, a forensic drug chemist with

the Drug Enforcement Agency. DeFrancesco holds a Ph.D. in physical-organic chemistry and has conducted several studies of 1,4-butanediol and GHB. The government also called Dr. Richard Irwin, a biochemist with the National Institute of Environmental Health Sciences, a branch of the National Institutes of Health. Irwin holds a Ph.D. in biochemistry and is the author of a peer-reviewed paper on 1,4-butanediol. Those two witnesses were qualified as experts in chemistry without objection from the defense.

DeFrancesco explained that the similarities and differences in the chemical structures of 1,4-butanediol and GHB could be determined by visually comparing two-dimensional representations of the atomic structures of the two chemicals. Based on that visual comparison, both DeFrancesco and Irwin concluded that 1,4-butanediol and GHB are substantially similar because they differ only in the “functional groups” found on the right side of the molecules.

DeFrancesco and Irwin explained that both 1,4-butanediol and GHB are composed of carbon, oxygen, and hydrogen atoms, and each one has an alcohol functional group on its left end. The molecules differ, however, on the right side because a 1,4-butanediol molecule has a second alcohol functional group, making it a dialcohol, while a GHB molecule has a carboxylic-acid functional group. Despite those different functional groups, DeFrancesco and Irwin were of the

opinion that the chemical structures of the two substances are substantially similar and that 1,4-butanediol is, therefore, a chemical analogue of GHB.

DeFrancesco and Irwin also explained how 1,4-butanediol is converted into GHB in the human body by two naturally occurring enzymes. Irwin testified that this metabolic conversion is a crucial fact in comparing the two substances. He also told the court that the effect of GHB on the body is to depress the central nervous system, while 1,4-butanediol itself has no effect on the central nervous system. Once ingested, however, 1,4-butanediol is rapidly converted to GHB. In fact, GHB can be detected in the bloodstream within two minutes after 1,4-butanediol is ingested. A person can slow down, but cannot prevent, the internal conversion of 1,4-butanediol to GHB. Because 1,4-butanediol is converted into GHB soon after ingestion, consuming it has the same effect on the body as consuming GHB. Indeed, the reason people take (or administer to others) 1,4-butanediol is that it is converted into, and produces the same depressant effects as, GHB.

Irwin acknowledged that the fact one compound metabolizes into another is not enough by itself to establish substantial similarity between their chemical structures. Nonetheless, he testified that the metabolic conversion of 1,4-butanediol into GHB is important when considering the degree of similarity

between them. That is because the chemical structure of 1,4-butanediol must be “basically identical” to that of GHB in order for it to “fit into the GHB receptor[s]” and produce the same effect.

DeFrancesco and Irwin provided no additional methodology or basis for their opinions, and they cited no studies or other objective data. During cross-examination Irwin stated that his determinations about whether chemical compounds are substantially similar is a “gut level thing” or based on “intuition,” but he later explained that what he meant was that it was a judgment based on thirty years of learning and experience as a chemist.

At the conclusion of the government’s case, the Browns moved to have the testimony of the government’s two experts excluded under Daubert and Federal Rule of Evidence 702. They argued the testimony did not meet the Daubert standards because it was unscientific and could not be tested. The district court denied their motion.

For its case in chief, the defense called Dr. John Steele, who holds a Ph.D. in plant pathology and works as a freelance consultant in the field of chemistry. When the Browns sought to have Steele qualified as an expert in chemistry, the government objected, contending that he was not qualified because he had no chemistry degree. The district court postponed its ruling on that issue. The court

decided that because it was a bench trial the court would hear all the testimony, including Steele's, and determine later whether it should be treated as expert testimony.

Steele testified to his opinion that 1,4-butanediol and GHB are not substantially similar. His opinion was based on his analyses of the two chemicals using a "Tanimoto coefficient" method. This method involves isolating the substructures in each of the chemical molecules to be compared, then dividing the number of common substructures between the two compounds by the total number of substructures, which produces a numerical result between zero and one hundred percent. Steele claimed that the resulting figure was a quantitative measure of the percentage of structural similarity between the two chemicals.

Calculating the Tanimoto coefficient both manually and through two computer programs that apply it (Chem Finder 4 and Chem ID Plus), Steele concluded that the similarity between the chemical structures of 1,4-butanediol and GHB is less than fifty percent. More specifically, Steele opined that 1,4-butanediol and GHB share seven out of fifteen total substructures. The quantitative measure of their structural similarity, in his view, is seven divided by fifteen, or 46.7%. Because Steele defined "substantial" to mean above fifty percent, in his opinion 1,4-butanediol is not substantially similar to, and thus not a

controlled substance analogue of, GHB.

Both of the government's experts testified that the Tanimoto coefficient could not be used to quantify accurately the degree of structural similarity between two simple substances like 1,4-butanediol and GHB. DeFrancesco acknowledged that he had tried two of the computer programs that utilized the Tanimoto coefficient and they produced results inconsistent with his opinion that there was substantial similarity. He suggested that the software programs might include other chemical properties apart from molecular structure, which would explain the inconsistency.

Irwin also rejected the use of the Tanimoto coefficients to compare the chemical structures of molecules. He testified that in his thirty-year career he had never heard of any chemist using the Tanimoto coefficient theory to compare the degree of similarity between two known, simple compounds. Similarly, DeFrancesco testified that he was unaware of other chemists or scientists who used the Tanimoto coefficient method to assess the structural similarity between two simple compounds like the two involved in this case. It is not an accepted methodology for such comparisons.

At the conclusion of the evidence, the Browns again moved to have DeFrancesco's and Irwin's testimony excluded under Daubert and Rule 702. The

district court denied the motion and took the case under consideration.

D.

On June 17, 2003, the district court issued a memorandum opinion with findings of fact. United States v. Brown, 279 F. Supp. 2d 1238 (S.D. Ala. 2003). The district court found that the opinions of the government's expert witnesses on the question of substantial similarity were relevant and reliable. Id. at 1244.

The court declined to recognize the defense witness, Steele, as an expert in the area of controlled substances because of his "lack of expertise." Id. at 1245. It also found that his methodology (the Tanimoto coefficient) was both unreliable and unreliably applied to the facts of this case. Id. at 1248, 1250. The court described how Steele had criticized the government's experts for using non-quantitative methods, while at the same time conceding that he was "not aware of the methods of other chemists" or whether other chemists used the Tanimoto coefficient. Id. at 1248, 1250. The district court also found that Steele had "manipulat[ed]" his use of the Tanimoto coefficient, "impermissibly emphasiz[ing] the differences between" the two substances by counting a "compound found in GHB, but not [1,4-butanediol], several times." Id. at 1248. Further, the court found that Steele's testimony based on the computer programs was unreliable because he did not even know how the programs defined "similarity." Id. at 1250.

For all of these reasons, the court refused to consider Steele’s testimony as reliable expert opinion, though it did consider the testimony as evidence. Id. at 1245.

In its role as factfinder, the district court concluded that the government had proven beyond a reasonable doubt that the chemical structure of 1,4-butanediol is substantially similar to that of GHB and, accordingly, 1,4-butanediol is a controlled substance analogue of GHB. Id. at 1245–50. On that basis, the court found the Browns guilty of conspiracy to distribute a controlled substance analogue for human consumption. Id. at 1250.

At the sentencing hearing, the district court sentenced Ronald Brown to 87 months imprisonment and Kevin Brown to 135 months imprisonment. It also entered a judgment of forfeiture against the Browns’ property. The Browns separately appealed their convictions, but we consolidated the appeals.

II.

The Browns raise several issues. They argue that under Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786 (1993), and Federal Rule of Evidence 702, the district court should not have admitted the opinion testimony of DeFrancesco and Irwin. They argue that the district court should have recognized Steele as an expert and considered his testimony accordingly. They argue that their convictions cannot be sustained because there was

insufficient evidence to find beyond a reasonable doubt that 1,4-butanediol and GHB are substantially similar. Finally, Kevin Brown also argues that the Analogue Act is unconstitutional because it violates the non-delegation doctrine of Article I.

III.

A.

Before we take up the Browns' first contention, which is that the district court committed Daubert error, we need to explain why it is difficult to persuade a court of appeals to reverse a district court's judgment on Daubert grounds. The theme that shapes appellate review in this area is the limited nature of it. "All evidentiary decisions are reviewed under an abuse-of-discretion standard." Gen. Elec. Co. v. Joiner, 522 U.S. 136, 141, 118 S. Ct. 512, 517 (1997). As a practical matter, the abuse of discretion standard means that a district court has a range of choice. Rasbury v. Internal Revenue Serv. (In re Rasbury), 24 F.3d 159, 168 (11th Cir. 1994) ("[U]nder the abuse of discretion standard of review there will be occasions in which we affirm the district court even though we would have gone the other way had it been our call."); United States v. Kelly, 888 F.2d 732, 745 (11th Cir. 1989) ("The abuse of discretion standard has been described as allowing a range of choice for the district court, so long as that choice does not constitute a

clear error of judgment.”). The size of that range—the amount of discretion accorded—depends on the issue being decided by the court. We recognize a significant range of choice for the district court on evidentiary issues, which is to say we defer to its decisions to a considerable extent. See *McCorvey v. Baxter Healthcare Group*, 298 F.3d 1253, 1257 (11th Cir. 2002) (“[O]ur review of evidentiary rulings by trial courts . . . is very limited.” (quotation omitted)).

We defer to district courts on their evidentiary rulings for at least a couple of reasons. One is that the district court’s role in presiding over trial proceedings means the district court is in the best position to decide the matter. *Pierce v. Underwood*, 487 U.S. 552, 560, 108 S. Ct. 2541, 2547 (1988). “Inherent in this [abuse of discretion] standard is the firm recognition that there are difficult evidentiary rulings that turn on matters uniquely within the purview of the district court, which has first-hand access to documentary evidence and is physically proximate to testifying witnesses and the jury.” *United States v. Jernigan*, 341 F.3d 1273, 1285 (11th Cir. 2003). Being at the trial as the proceedings occur and the evidence unfolds, a trial judge has an advantageous familiarity with the proceedings and “may have insights not conveyed by the record” about the evidence and the issues relating to it. *Pierce*, 487 U.S. at 560, 108 S. Ct. at 2547. Duplicating that familiarity and those insights at the appellate level is impractical

and often impossible. Id.; see generally Wilton v. Seven Falls Co., 515 U.S. 277, 289, 115 S. Ct. 2137, 2144 (1995) (“[T]he reviewing attitude that a court of appeals takes toward a district court decision should depend upon the respective institutional advantages of trial and appellate courts.” (citation and quotation omitted)).

A second reason we give considerable deference to the trial court on evidentiary issues is that it is often not possible to precisely calibrate rules for the many different circumstances that can arise. How to apply evidentiary rules in all possible scenarios is not a matter amenable to close regulation, because the circumstances that arise during trial “involve multifarious, fleeting, special, narrow facts that utterly resist generalization.” Pierce, 487 U.S. at 561–62, 108 S. Ct at 2548 (quotation omitted). Evidentiary issues often do not involve a “generally recurring, purely legal matter” or a “question readily resolved by reference to general legal principles and standards alone.” Buford v. United States, 532 U.S. 59, 65, 121 S. Ct. 1276, 1280 (2001) (justifying deferential review of a particular sentencing guidelines issue). Instead, they almost always present a question that “grows out of, and is bounded by, case-specific detailed factual circumstances. And the fact-bound nature of the decision limits the value of appellate court precedent” Id. at 65, 121 S. Ct. at 1280–81.

What is true about the review of evidentiary issues in general applies with equal or even greater force to Daubert issues in particular, an area where the abuse of discretion standard thrives. See Kumho Tire Co. v. Carmichael, 526 U.S. 137, 152–53, 119 S. Ct. 1167, 1176 (1999); United States v. Abreu, 406 F.3d 1304, 1305–07 (11th Cir. 2005) (per curiam); McClain v. Metabolife Int’l Inc., 401 F.3d 1233, 1238 (11th Cir. 2005); United States v. Frazier, 387 F.3d 1244, 1258–59 (11th Cir. 2004) (en banc). Immersed in the case as it unfolds, a district court is more familiar with the procedural and factual details and is in a better position to decide Daubert issues. The rules relating to Daubert issues are not precisely calibrated and must be applied in case-specific evidentiary circumstances that often defy generalization. And we don’t want to denigrate the importance of the trial and encourage appeals of rulings relating to the testimony of expert witnesses. All of this explains why “the task of evaluating the reliability of expert testimony is uniquely entrusted to the district court under Daubert,” and why “we give the district court ‘considerable leeway’ in the execution of its duty.” Rink v. Cheminova, Inc., 400 F.3d 1286, 1291 (11th Cir. 2005) (citations omitted); accord Frazier, 387 F.3d at 1259. That is true whether the district court admits or excludes expert testimony. Joiner, 522 U.S. at 141–42, 118 S. Ct. at 517; id. at 142, 118 S. Ct. at 514 (“A court of appeals applying ‘abuse-of-discretion’ review to [Daubert]

rulings may not categorically distinguish between rulings allowing expert testimony and rulings disallowing it.”). And it is true where the Daubert issue is outcome determinative. Id. at 141–43, 118 S. Ct. at 517.

To be sure, review under an abuse of discretion standard does entail review, and granting considerable leeway is not the same thing as abdicating appellate responsibility. We will reverse when the district court’s Daubert ruling does amount to an abuse of discretion that affected the outcome of a trial. See Fed. R. Evid. 103(a); Abreu, 406 F.3d at 1306; Frazier, 387 F.3d at 1266 n.20. An abuse of discretion can occur where the district court applies the wrong law, follows the wrong procedure, bases its decision on clearly erroneous facts, or commits a clear error in judgment. See McClain, 401 F.3d at 1238; Frazier, 387 F.3d at 1259; see also Moorer v. Demopolis Waterworks & Sewer Bd., 374 F.3d 994, 996–97 (11th Cir. 2004) (per curiam); United States v. Brown, 332 F.3d 1341, 1343 (11th Cir. 2003); Jones v. Int’l Riding Helmets, Ltd., 49 F.3d 692, 694 (11th Cir. 1995). In the Daubert context, if one of those types of serious error occur, we may conclude that the district court has not properly fulfilled its role as gatekeeper. We have also found that a district court abuses its discretion where it fails to act as a gatekeeper by essentially abdicating its gatekeeping role. McClain, 401 F.3d at 1238 & n.3 (reversing where the district court stated it did not have sufficient scientific

knowledge to exclude the evidence).

B.

In Daubert the Supreme Court expounded on the district court's role as a gatekeeper in determining whether expert testimony on scientific matters is admissible under Rule 702. 509 U.S. at 589, 113 S. Ct. at 2794–95. It said that a district court “must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable,” and that the court must screen out “expert” testimony that is not sufficiently reliable or trustworthy for the factfinder to consider. See id. at 589, 113 S. Ct. at 2795. The Browns say the district court made a clear error of judgment in not screening out as unreliable the opinions of the government's two witnesses, opinions the court admitted as expert testimony. The opinion testimony of those two experts, the Browns argue, failed to meet the reliability standards of Daubert and Rule 702.

Rule 702 states:

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.

The Supreme Court in Daubert set out a list of “general observations” for determining whether expert testimony is sufficiently reliable to be admitted under Rule 702. 509 U.S. at 593, 113 S. Ct. at 2796. Those general observations focus on four primary inquiries about the expert’s theory or technique: (1) whether it can be (and has been) tested; (2) whether it has been subjected to peer review and publication; (3) what its known or potential rate of error is, and whether standards controlling its operation exist; and (4) whether it is generally accepted in the field. Id. at 593–94, 113 S. Ct. at 2796.

The visual assessment method used by the government’s witnesses only met one of the four Daubert factors. DeFrancesco and Irwin conceded that their method and conclusions were not quantitative or testable by the scientific method. Instead, they were based on visual comparisons of the molecular models combined with expert knowledge of chemistry. During cross-examination, Irwin characterized his opinion as being a “gut level thing” and based on intuition, but he later explained that he used those terms to refer to the knowledge and experience he had gained from thirty years as a chemist. The government produced no papers or studies in which the methodology or opinions of DeFrancesco and Irwin were subjected to peer review. Their method did, however, meet the general acceptance factor. DeFrancesco and Irwin testified that their method is generally accepted,

and the district court credited their testimony that it is. “The credibility of a witness is in the province of the factfinder,” and we “will not ordinarily review the factfinder’s determination of credibility.” United States v. Copeland, 20 F.3d 412, 413 (11th Cir. 1994) (per curiam). The Browns have not challenged the credibility of these two experts, and we see nothing in the record to convince us that the district court clearly erred in finding that they were credible.

The question, then, is whether expert opinion evidence that does not meet three of the four Daubert factors nevertheless can be admitted. In the right circumstances, the answer to that question is “yes.” The Supreme Court made clear in its Daubert opinion that the factors it set out there were not to be rigidly applied, but were instead to serve as guidelines for federal district courts applying Rule 702. The Court said, “[t]he inquiry envisioned by Rule 702 is, we emphasize, a flexible one,” Daubert, 509 U.S. at 594, 113 S. Ct. at 2797; “[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test,” id. at 593, 113 S. Ct. at 2796.

The decision in Kumho Tire elaborated on the flexible nature of the inquiry. There the Court pointed out that “Daubert’s list of specific factors neither necessarily nor exclusively applies to all experts or in every case.” Id. at 141, 119 S. Ct. at 1171. Whether the Daubert opinion factors are even pertinent to assessing

reliability in a given case will “depend[] on the nature of the issue, the expert’s particular expertise, and the subject of his testimony.” Id. at 150, 119 S. Ct. at 1175 (internal marks omitted). Because the applicability of the Daubert factors depends on the individual facts in a particular case, the Court said that it could:

neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in Daubert, nor [could it] now do so for subsets of cases categorized by category of expert or by kind of evidence. Too much depends upon the particular circumstances of the particular case at issue.

Id. at 150, 119 S. Ct. at 1175. This means that expert testimony that does not meet all or most of the Daubert factors may sometimes be admissible.

The Supreme Court said in Kumho Tire that the question of “whether Daubert’s specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine.” Id. at 153, 119 S. Ct. at 1176. We are to review the district court’s decision on how to determine reliability with the same abuse of discretion standard that we use to review its ultimate conclusion. Id. at 152, 119 S. Ct. at 1176 (“[T]he trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable.”); see also Abreu, 406 F.3d at 1307 (“The district court has wide latitude in deciding how to determine reliability.”); United States v. Majors, 196 F.3d 1206, 1215 (11th Cir. 1999).

In this case, the issue was whether the chemical structures of 1,4-butanediol and GHB are “substantially similar.” After hearing the testimony of the government’s two expert witnesses, the court found that DeFrancesco’s and Irwin’s opinions were “based on their knowledge, skill, and experience” and on “sufficient facts and data.” Brown, 279 F. Supp. 2d at 1244. In light of its determination that their testimony about the general acceptance of their method was credible, the court concluded that “both [experts] employed an accepted method.” Id. Moreover, it found that the experts had applied that methodology reliably. Id. We cannot say that the court abused its discretion in also concluding that the specific Daubert factors (such as testability and peer review) were not required in this particular situation. Nor can we say that its key credibility determination was clearly erroneous. Given the circumstances of this case, and given the heavy thumb—really a thumb and a finger or two—that is put on the district court’s side of the scale, we conclude that it was not an abuse of discretion to admit the expert opinions of the two government witnesses in this case.

Our conclusion is consistent with the “liberal thrust of the Federal Rules and their general approach of relaxing the traditional barriers to opinion testimony.” Daubert, 509 U.S. at 588, 113 S. Ct. at 2794 (internal marks and citation omitted); see also Joiner, 522 U.S. at 142, 118 S. Ct. at 517 (“[T]he Federal Rules of

Evidence allow district courts to admit a somewhat broader range of scientific testimony than would have been admissible under Frye . . .”). Those barriers are even more relaxed in a bench trial situation, where the judge is serving as factfinder and we are not concerned about “dumping a barrage of questionable scientific evidence on a jury.” Allison v. McGhan Med. Corp., 184 F.3d 1300, 1310 (11th Cir. 1999); see also id. (recognizing that the jury “would likely be even less equipped than the judge to make reliability and relevance determinations and more likely than the judge to be awestruck by the expert’s mystique”). There is less need for the gatekeeper to keep the gate when the gatekeeper is keeping the gate only for himself.

C.

We turn our attention now to the Browns’ witness, Dr. Steele. Rule 702 requires, among other things, that: (1) a witness be “qualified as an expert by knowledge, skill, experience, training, or education” and (2) his testimony be “the product of reliable principles and methods” that were reliably applied to the facts at hand. Fed. R. Evid. 702. The district court determined that Steele was not qualified as an expert in controlled substances and that the method he used to reach his opinion was both unreliable and unreliably applied. The Browns challenge those conclusions. Putting their arguments in the best light, the Browns contend

that the district court abused its discretion, by relying on clearly erroneous facts or making a clear error of judgment, when it refused to qualify Steele as an expert and when it concluded that Steele's Tanimoto coefficient method was unreliable and unreliably applied.

The district court did not abuse its discretion in declining to qualify Steele as an expert. As the district court explained, Steele's academic work and professional experience related more to plant pathology and botany than to chemistry. See Brown, 279 F. Supp. 2d at 1244–45. Though we recognize that Steele does have experience in chemistry, we can find no abuse of discretion in light of the fact that Steele has only worked with 1,4-butanediol and GHB “on isolated projects” and that “he does not possess a license to work with controlled substances.” Id. at 1245.

Moreover, even if we were to agree with the Browns that Steele should have been qualified as an expert, we would still reject their argument that the district court erred in finding his method unreliable and unreliably applied. The district court found that Steele's methodology was unreliable because it produces “skewed” and “bizarre and curious” results when relatively simple molecules are at issue, as in this case. Id. at 1248–49; see id. at 1248 (“The skewed results convinced the court that the Tanimoto coefficient is not a reliable indicator of

structural similarity when assessing two simple linear molecules with only one differing functional group”); id. at 1249 (discussing three examples of “bizarre and curious” results).

For a number of reasons, the district court also found that Steele had applied his methodology in an unreliable way. The court explained that Steele had overemphasized the differences between the two chemicals by unnecessarily double-counting a substructure present in GHB but not in 1,4-butanediol. Id. at 1248. It found that Steele’s sole reliance on the Tanimoto coefficient and his “stubborn refusal . . . to supplement his opinion by visually assessing” the chemicals “reeked of bias.” Id. at 1250. The court further found that Steele did not know, and could not explain, how the computer programs he used defined “similarity.” Id. Because Steele did not know how the computer programs defined “similarity,” the results were of questionable value. Id. The court expressed its “amaz[ement] that Dr. Steele would stake his professional reputation on the results of a program without knowing how it works.” Id. It said that Steele’s “[c]omplete acceptance of [the computer programmer’s] subjective definition of ‘similarity’” amounted to “blind reliance devoid of merit.” Id.

Even if all of that were not enough by itself, the Browns’ arguments would still fail given the unique circumstances of this case. Because this was a bench

trial, the district court was not only the gatekeeper but also the factfinder. The district court as gatekeeper did not exclude any of Steele’s testimony. Instead, it allowed Steele to testify, explicitly reserving for later the determination of whether his testimony complied with Daubert and Rule 702. The court later determined that it was “unwilling to qualify Dr. Steele as an expert with knowledge in the area of controlled substances, especially [1,4-butanediol] and GHB.” Nevertheless, the court “still consider[ed] Dr. Steele’s testimony, but his lack of expertise in the area substantially affect[ed] the weight” the court gave it. Id. at 1245. In other words, the court-as-gatekeeper let the court-as-factfinder consider Steele’s testimony, but the court-as-factfinder decided not to give it much weight. That means the factfinder heard the testimony the Browns sought to have admitted, and their complaint really is about the weight given to that testimony.

Questions about the weight given to testimony, as distinguished from the issue of its admissibility, are for the factfinder. See United States v. Hernandez, 141 F.3d 1042, 1052 (11th Cir. 1998). “If the district court’s account of the evidence is plausible in light of the record viewed in its entirety, the court of appeals may not reverse it even though convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently.” Anderson, 470 U.S. at 573–74, 105 S. Ct. at 1511. We certainly cannot say that the district court

clearly erred with regard to the weight it gave Steele’s testimony.

IV.

The Browns also argue that their conviction must be reversed because the evidence was insufficient to convict them. They contend that the district court could not reasonably conclude that the government proved beyond a reasonable doubt the only contested element of the offense: whether the chemical structure of 1,4-butanediol is substantially similar to that of GHB. They make two arguments about this. First, Kevin Brown argues that the district court improperly considered the metabolic conversion of 1,4-butanediol into GHB on the question of substantial similarity. Second, the Browns argue that even if it was proper to consider 1,4-butanediol’s conversion into GHB, the government still failed to prove beyond a reasonable doubt that the chemical structures of 1,4-butanediol and GHB are substantially similar.¹

We review de novo whether sufficient evidence supports a conviction, but we resolve all reasonable inferences in favor of the verdict. United States v. Ortiz, 318 F.3d 1030, 1036 (11th Cir. 2003) (per curiam). “In reviewing the sufficiency of the evidence in support of a conviction in a criminal case following a non-jury

¹ The Browns also argue that the evidence is insufficient because the government’s only evidence—the expert testimony—should have been excluded under Daubert. This argument, however, merely recasts their Daubert argument, which we have already dealt with. See Part III.B, supra.

trial, we must determine whether the evidence, construed in the light most favorable to the government, would permit the trier of fact to find the defendant guilty beyond a reasonable doubt.” United States v. Burstyn, 878 F.2d 1322, 1324 (11th Cir. 1989) (per curiam). “It is not our function to make credibility choices or to pass upon the weight of the evidence.” United States v. Turner, 812 F.2d 1552, 1563 (11th Cir. 1987). Instead, we must sustain the verdict “where there is a reasonable basis in the record for” it. Parker v. Scrap Metal Processors, Inc., 386 F.3d 993, 1010 (11th Cir. 2004) (quotation omitted).

We are not persuaded by Kevin Brown’s argument that, in deciding whether the two substances were substantially similar, the district court should not have considered the metabolic conversion of 1,4-butanediol into GHB. As the government’s two experts testified, the ready metabolic conversion does evidence substantial similarity. Irwin explained why: “This structure has to be basically identical to this structure in order for the [1,4-butanediol] to be converted to GHB and for it to fit into the GHB receptor. And so in that context that influences—that basically requires that the structures be very similar.” His testimony is in accord with, and Brown’s contrary argument conflicts with, what we said in United States v. Fisher, 289 F.3d 1329 (11th Cir. 2002), cert. denied, 537 U.S. 1112, 123 S. Ct. 903 (2003). There, in rejecting a void for vagueness challenge to the Analogue

Act, we stated that the fact the compound GBL converts into GHB upon ingestion means that the chemical structures of the two compounds are substantially similar. Id. at 1339; see also United States v. Washam, 312 F.3d 926, 931 (8th Cir. 2002) (holding, in the course of rejecting a void for vagueness challenge to the Analogue Act, that it is proper to consider metabolic conversion in determining the structural similarity of 1,4-butanediol and GHB); United States v. Roberts, 363 F.3d 118, 124–26 (2d Cir. 2004) (same); id. at 126 n.4 (“We emphasize that the fact that 1,4-butanediol metabolizes into GHB is significant not because it means that the chemicals are identical, but because it indicates that the readily ascertainable pre-ingestion similarity between 1,4-butanediol and GHB—the mere two-atom difference between the molecules—is a similarity of a material and relevant sort, given the purpose of the Act.”).

As to the Browns’ other argument, viewing the evidence in the light most favorable to the government, as we must, we conclude that there was a reasonable basis in the record for the district court’s decision. First, it was undisputed that 1,4-butanediol rapidly metabolizes into GHB when it is ingested and, as we have explained, that is a valid piece of evidence on the question of substantial similarity. Second, the government presented the evidence of two well-qualified experts, who both unequivocally stated their opinions that 1,4-butanediol is a controlled

substance analogue of GHB because it has a substantially similar chemical structure. These experts testified that while the substances are not identical, they are substantially similar because they are “identical except for the terminal carbons”; that is, in the terminal functional group on their right side. This testimony is sufficient to support the factfinder’s determination that 1,4-butanediol and GHB are substantially similar and the resulting conclusion that the Browns are guilty of violating 21 U.S.C. § 846.

The fact that the Browns provided some evidence to the contrary through the testimony of Steele does not undermine our conclusion. That a defendant has provided some testimony to support his theory of the case is not enough to show insufficient evidence, because the factfinder is free to reject that testimony. Cf. United States v. Kelley, ___ F.3d ___, 2005 WL 1403400, at *6 (11th Cir. 2005) (in a sufficiency of the evidence challenge, rejecting the defendant’s argument that a government witness’ testimony was unbelievable because it contradicted the defendant’s witness’ testimony); Liberty Mut. Ins. Co. v. Falgoust, 386 F.2d 248, 253 (5th Cir. 1967) (“Jury findings on conflicting evidence are binding on this Court, which accepts as true that version of the testimony the jury might reasonably have adopted in reaching its verdict . . .”).²

² In Bonner v. Prichard, 661 F.2d 1206, 1207 (11th Cir. 1981) (en banc), we adopted as binding precedent all Fifth Circuit decisions handed down prior to October 1, 1981.

Finally, the Browns’ argument that a reasonable doubt must exist because scientists could legitimately disagree about whether 1,4-butanediol and GHB are substantially similar is without merit. When we review whether there was sufficient evidence to uphold a criminal conviction, it is not necessary that one hundred percent of the evidence point to guilt. Nor do we ask whether the only possible verdict the factfinder could have reached is guilty. Our review is not that searching. We must hold that the evidence underlying the conviction was sufficient “so long as a reasonable trier of fact, choosing among reasonable interpretations of the evidence, could find guilt beyond a reasonable doubt.” United States v. Pineiro, 389 F.3d 1359, 1367 (11th Cir. 2004) (citing United States v. Lluesma, 45 F.3d 408, 409–10 (11th Cir. 1995)). Instead of re-weighing the evidence and making credibility determinations ourselves, we decide only whether there is a reasonable basis in the record to support the verdict. Here, the district court reasonably could, and did, find the government’s experts believable. Their testimony provided a reasonable basis for concluding beyond a reasonable doubt that the chemical structures of 1,4-butanediol and GHB are substantially similar for purposes of 21 U.S.C. § 802(32)(A)(i).

V.

Lastly, Kevin Brown argues that the statute under which he was convicted,

21 U.S.C. § 813, violates the non-delegation doctrine of Article I of the Constitution, and that the district court erred in denying his motion to dismiss on that basis. Because Brown has waived his right to appeal this issue, we will not consider it.

As part of the joint bench trial agreement Brown entered into with the government, he agreed to waive his right to appeal issues arising from his conviction and sentencing, with limited exceptions. The only exception that Brown could conceivably argue encompasses his non-delegation argument is exception (d): “The sole legal and factual issue of whether, pursuant to Title 21, United States Code, Section 802(32)(A)(i), the chemical structure of 1,4-Butanediol is substantially similar to the chemical structure of the Schedule I controlled substance GHB, including any rulings by the district court addressing that issue.”

Brown’s argument about the constitutionality of the Analogue Act does not go to the “sole legal and factual issue of whether . . . the chemical structure of 1,4-Butanediol is substantially similar to the chemical structure of the Schedule I controlled substance GHB.”

Brown does not contend that his waiver was unknowing or involuntary. See United States v. Bushert, 997 F.2d 1343, 1350 (11th Cir. 1993) (stating that a

knowing and voluntary waiver of the right to appeal will be enforced). Because Brown's non-delegation argument is clearly outside the exceptions to the appeal waiver, he has waived his right to raise it. See, e.g., United States v. Weaver, 275 F.3d 1320, 1333 (11th Cir. 2001).

VI.

For the foregoing reasons, we conclude that the district court did not abuse its discretion in its evidentiary decisions and that there was sufficient evidence to support the Browns' convictions. Kevin Brown's non-delegation argument is foreclosed by his appeal waiver.

AFFIRMED.