

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

| | | |
|--------------------------|---|--|
| UNITED STATES OF AMERICA |) | |
| |) | |
| v. |) | Criminal Action No. 10-256-08 (RMC) |
| |) | |
| NOE MACHADO-ERAZO, |) | |
| |) | |
| Defendant. |) | |
| |) | |

OPINION

On the eve of trial, Defendant Noe Machado-Erazo has moved to exclude the testimony of a government expert witness, Special Agent David Magnuson of the Federal Bureau of Investigation, who would testify about cellular telephone site analysis. Mr. Machado-Erazo argues that S.A. Magnuson’s testimony is not based on a sufficiently reliable methodology to be admissible under the Federal Rules of Evidence and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592 (1993), and that it would therefore be unduly prejudicial. The government responds that S.A. Magnuson is a highly trained agent whose testimony is firmly based in scientific principles. Mr. Machado-Erazo’s motion was denied in open court at the end of jury selection on June 14, 2013. The Court now writes to expand further upon its reasoning.

I. FACTS

Noe Machado-Erazo is charged with offenses related to his alleged involvement in MS-13, a gang formed years ago in Los Angeles, with roots in El Salvador.¹ Specifically, he is charged by Superseding Indictment with one count of conspiracy in violation of the Racketeer Influenced Corrupt Organizations Act (RICO), 18 U.S.C. § 1962(d); one count of Murder in Aid

¹ Additional background on MS-13 is set forth in the Court’s prior Opinion regarding codefendant Yester Ayala. *See United States v. Y.A.*, Cr. No. 11-36 (RMC), 2013 WL 2138907, at *2–3 (D.D.C. Feb. 11, 2013).

of Racketeering (“VICAR”), 18 U.S.C. § 1959(a)(1); and one count of Possession of a Firearm During and in Relation to a Crime of Violence, 18 U.S.C. § 924(c)(1)(A). The Superseding Indictment also charges Mr. Machado-Eraza with the murder underlying the VICAR count as a special sentencing factor. Jury selection was conducted on June 14, 2013 and trial will begin on June 18, 2013.²

The government plans to offer the testimony of S.A. David Magnuson of the FBI Cellular Analysis Survey Team to show “that the cell phones used by defendants Machado Erazo, Jose Martinez Amaya, and a cooperating witness were in the remote area where the body of Felipe Enriquez was found on or about March 28, 2010.” Gov’t Opp. [Dkt. 368] at 2. S.A. Magnuson’s report is 38 pages of slides, duplicated as Exhibit A to Mr. Machado-Eraza’s Motion. *See* Magnuson Report, Def. Mot. [Dkt. 367], Ex. A [Dkt. 367-2]. The government also provided the report in its Trial Exhibit Binder, premarked as Government Exhibit 306. The report “depicts the geographic location of the cell towers/sectors utilized by the phones analyzed as they moved through the Cricket and T-Mobile cellular networks placing and receiving phone calls on the dates and times indicated.” Magnuson Report at 2. The report is “based on cell records obtained by subpoena.” Gov’t Opp. at 2. The government emphasizes that S.A. Magnuson “will not claim to have determined the exact location of the phone user, but rather the general location where a cell phone would have to be located to use a particular cell tower and sector.” *Id.* at 2 n.1.

The government intends to offer S.A. Magnuson as an expert witness under Federal Rule of Evidence 702. Mr. Machado-Eraza argues that the proposed testimony is

² Due to a medical emergency, this case will be transferred after motions hearings on June 17, 2013, to Chief Judge Royce C. Lamberth for trial, starting on June 18, 2013.

insufficiently reliable to be admissible as expert testimony. He also argues that the Court should exclude the testimony as irrelevant or, in the alternative, as unduly prejudicial under Rule 403.³

II. LEGAL STANDARDS

Federal Rule of Evidence 701 governs opinion testimony by lay witnesses, who may testify only as to opinions that are “(a) rationally based on the witness’s perception; (b) helpful to clearly understanding the witness’s testimony or to determining a fact in issue; and (c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702.”

In contrast, Rule 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

(b) the testimony is based on sufficient facts or data;

(c) the testimony is the product of reliable principles and methods; and

(d) the expert has reliably applied the principles and methods to the facts of the case.

A federal court serves as the gatekeeper for expert testimony. Federal Rule of Evidence 702 imposes a “special obligation upon a trial judge” to ensure that expert testimony is not only relevant, but reliable. *Kuhmo Tire Co. Ltd. v. Carmichael*, 526 U.S. 137, 147 (1999).

“Under *Daubert* [*v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592 (1993)], the district

³ Rule 403 provides that “[t]he court may exclude relevant evidence if its probative value is substantially outweighed by a danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence.”

court is required to address two questions, first whether the expert’s testimony is based on ‘scientific knowledge,’ and second, whether the testimony ‘will assist the trier of fact to understand or determine a fact in issue.’” *Meister v. Med. Eng’g Corp.*, 267 F.3d 1123, 1126 (D.C. Cir. 2001) (quoting *Daubert*, 509 U.S. at 592). The first inquiry “demands a grounding in the methods and procedures of science, rather than subjective belief or unsupported speculation.” *Id.* at 1127; *see also Daubert*, 509 U.S. at 592–93 (requiring a “preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue”). The second inquiry “goes primarily to relevance.” *Daubert*, 509 U.S. at 591. The presumption under the Rules is that expert testimony is admissible once a proponent makes the requisite threshold showing; further disputes go to weight, not admissibility. *See id.* at 588.

There are four factors that courts generally consider in evaluating scientific validity under *Daubert*:

- (1) whether the theory or technique can be and has been tested;
- (2) whether the theory or technique has been subjected to peer review and publication;
- (3) the method’s known or potential rate of error;
- and (4) whether the theory or technique finds general acceptance in the relevant scientific community.

Ambrosini v. Labarraque, 101 F.3d 129, 133–34 (D.C. Cir. 1996) (citing *Daubert*, 509 U.S. at 593–94). “[T]he inquiry is a ‘flexible one,’” no one factor is dispositive, and the four-factor list is not exhaustive. *Id.* (quoting *Daubert*, 509 U.S. at 593–95).

A trial court has “latitude. . . to decide whether or when special briefing or other proceedings are needed to investigate reliability.” *Kumho Tire*, 526 U.S. at 152. “District courts are not required to hold a *Daubert* hearing before ruling on the admissibility of scientific evidence.” *See In re Hanford Nuclear Reservation Litig.*, 292 F.3d 1124, 1138–39 (9th Cir. 2002) (citing *United States v. Alatorre*, 222 F.3d 1098, 1100 (9th Cir. 2000)); *accord Oddi v.*

Ford Motor Co., 234 F.3d 136, 154 (3d Cir. 2000) (“[T]he district court already had before it the depositions and affidavits of the plaintiff’s experts. Nothing more was required.”). “Thus, a trial court properly may exercise its discretion to forego a formal pretrial hearing outside the presence of the jury. . . . [W]here the dispute is easily resolved, no hearing, in limine or otherwise, should be necessary.” 29 Wright & Miller, *Federal Practice & Procedure: Evidence* § 6266 (1st ed. & Supp.). “However, one aspect of the necessary procedure is clear: the trial court should identify for the record the factors bearing on reliability that it relied upon in reaching a determination.”

Id.

The Court denied Mr. Machado-Erazo’s motion in open court on Friday, June 14, 2013, so counsel could properly prepare for trial on Tuesday, June 18, and provides its full reasoning below.

III. ANALYSIS

Mr. Machado-Erazo makes three arguments: (1) S.A. Magnuson’s methodology is not reliable and thus fails the requirements of Federal Rule of Evidence 702 and *Daubert*, Def. Mot. at 5–13; (2) because it lacks reliability, the evidence is not relevant, *id.* at 14–15; and (3) because it lacks reliability, the evidence should be excluded under Federal Rule of Evidence 403 as unduly prejudicial, *id.* at 15–16. Mr. Machado-Erazo relies primarily on two bases to support his argument: a case (*United States v. Evans*, 892 F. Supp. 2d 949 (N.D. Ill. 2012)) and an article (Michael Cherry, “Prosecutors’ use of mobile phone tracking is ‘junk science,’ critics say,” *American Bar Journal*, June 2013, attached as Exhibit B to his motion).⁴

⁴ Mr. Machado-Erazo does not challenge S.A. Magnuson’s qualifications, which the Court finds are robust and establish him as well educated, well practiced, and well trained in the proffered area of expertise. *See United States v. Davis*, No. 11–60285–CR, 2013 WL 2156659, at *3–4 (S.D. Fla. May 17, 2013) (concluding that “Agent Magnuson’s qualifications easily clear the low hurdle imposed by *Daubert*” and noting that “for the past eight years, Agent Magnuson has regularly analyzed cellular-telephone records in conducting criminal investigations, and, for the

The core of Mr. Machado-Erazo's *Daubert* argument is that "[t]he evidence and methodology . . . used to substantiate the conclusion that the cell tower used to transmit a call is indicative of the defendant's location is faulty and misleading." Def. Mot. at 13. He asserts that "[Special] Agent Magnuson's report is based upon the faulty assumption that a cell phone always connects to the closest cell tower at the time a call is placed and that the cell phone coverage range can be estimated or 'projected' based solely upon his own 'expertise' rather than actual data." *Id.* at 6. In Mr. Machado-Erazo's view, S.A. Magnuson's premise is faulty because, "if the phone is not connecting to the closest tower at that time, then there is no useful correlation between the location of the tower at the time the call is placed and the location of the caller." *Id.* at 7. Mr. Machado-Erazo lists nine factors that, he argues, determine which cellular tower handles a given call. *See id.* at 8 (listing, *e.g.*, "which tower has the available capacity," "[l]ine of sight," and "[t]he amount of interference in the area from other towers").

Mr. Machado-Erazo further argues that S.A. Magnuson's testimony "is not based upon sufficient facts or data" because "the cellular carrier does *not* provide data regarding the actual coverage area of any tower at the time" of any given phone call, "and there is no method for determining this in historical call detail records." *Id.* at 9. He asserts that S.A. Magnuson's testimony is "not the product of reliable principles and methods" because there is "no published set of principles or methods governing the estimation of cell tower coverage based on simply drawing circles on a map where the circles or pie-shaped wedges overlap and/or the size of these are determined by the distance between cell towers." *Id.* at 10. Moreover, Mr. Machado-Erazo argues, "[Special] Agent Magnuson has not applied the principles and methods reliably" because "there are no principles of methods to determine the coverage area of a cell tower or cell tower

past three years, Agent Magnuson has done nothing but analyze cellular-telephone records in support of criminal investigations").

sector based simply on the location of the cell towers without applying complex engineering formulae to known parameters for each cell tower sector antenna.” *Id.* at 12.

Mr. Machado-Erazo adds the argument that S.A. Magnuson’s proposed testimony is not relevant under Rule 401 or is unfairly prejudicial under Rule 403. He relies on the contention that, “[i]n order to inculcate Mr. Machado-Erazo by offering the connections of various cell phones with various towers as circumstantial evidence of his and other alleged conspirators’ locations, the Government must prove the preliminary fact that there is a repeatable[,] nearly 1:1 causal correlation of the cell phone signals being routed to the geographically nearest tower.” *Id.* at 14–15; *see also id.* at 15 (“The direction of the antennae on a cell site with a ‘guess’ about the range of that cell site does not tend to help make a determination of a fact that is of consequence more or less probable and certainly cannot be the basis for an inference that any particular phone was in the ‘vicinity’ of any particular address.”). Mr. Machado-Erazo argues that because “the actual methodology (or lack thereof) behind [the] plotted maps [used by S.A. Magnuson] does not support [the] conclusion” that “Mr. Machado-Erazo’s phone was in certain key locations at specific times,” S.A. Magnuson’s testimony should be excluded under Rule 403 because it is unduly prejudicial. *Id.* at 16.

The government responds that the motion should be denied without a *Daubert* hearing. It asserts that S.A. Magnuson is qualified because he is “a highly trained Special Agent in the FBI’s Cellular Analysis and Survey Team” who “has received training from the cellular service providers, worked on hundreds of cases involving thousands of hours of practical experience analyzing historical call detail records and has been qualified approximately twenty times in courts as an expert in the field of cell site analysis.” Gov’t Opp. at 5. The government predicts that S.A. Magnuson will testify that “the data relied upon to formulate his opinions are

routinely relied upon” by both law enforcement and cell service providers. *Id.* Citing a representative sample of cases, the government contends that “[t]estimony about cell phone technology and the ability to determine the general area where calls are placed and received has been admitted in courts throughout the country,” and the government has located no case finding “this type of evidence [to be] untrustworthy or junk science.” *Id.* at 5–6 (citing cases). The government asserts that peer-reviewed articles are not needed to satisfy *Daubert* because “cell phone technology is neither novel nor particularly complex” and multiple courts have already concluded that “the underlying methodology is sound and can reliably indicate the general location of the cell phone user.” *Id.* at 6–8 (citing cases). The government further contends that the proper methodology was reliably applied because “[c]ell site and sector analysis does not determine the exact location of a cell phone, but rather shows the general area the phone had to be located based on cell tower location and the sector of the tower used to transmit the call.” *Id.* at 9.

Distinguishing *Evans*, the case heavily relied on by Mr. Machado-Erazo, the government says that Mr. Marchado-Erazo overstates its holding. The government notes that the *Evans* court admitted (albeit as lay testimony) the same type of evidence the government seeks to admit here—*i.e.*, “testimony concerning maps [an agent] created indicating the location of certain cell towers used by [the defendant’s] phone during the course of the conspiracy in relation to other locations relevant to the crime.” *See Evans*, 892 F. Supp. 2d at 953. The government asserts that it was entirely different evidence—which the government here characterizes as testimony “that the defendant’s phone could have been in the same building where the kidnap victim was held”—that the *Evans* court precluded. Gov’t Opp. at 5 n.4.

Finally, the government suggests that no evidentiary hearing is required to assess S.A. Magnuson's proposed testimony because his methodology has been found reliable in "numerous cases across the country" and "has been tested through numerous cases investigated by law enforcement." Gov't Opp. at 9. It argues that the expert report submitted in this case establishes itself as based on sufficient data and as the product of a reliable methodology. *Id.* at 9.

Mr. Machado-Erazo's argument appears forceful at first blush, given his reliance on *Evans*, which questioned the type of expert testimony proffered here.⁵ *Evans*, 892 F. Supp. 2d at 949–57. On closer evaluation, however, the motion is seriously flawed. It is noteworthy that another judge of this Court recently rejected nearly identical arguments without a *Daubert* hearing on a motion to exclude nearly identical testimony about cell-site analysis from a different FBI Special Agent. *United States v. Jones*, ___ F. Supp. 2d ___, Cr. No. 05-386 (ESH), 2013 WL 246615 (D.D.C. Jan. 23, 2013). Moreover, in a lengthy opinion issued after a *Daubert* hearing, a judge in the Southern District of Florida recently permitted S.A. Magnuson to offer the exact type of testimony he would offer here, again rejecting nearly identical *Daubert* arguments. *United States v. Davis*, No. 11–60285–CR, 2013 WL 2156659 (S.D. Fla. May 17, 2013). The Court finds *Jones* and *Davis* persuasive and reaches the same conclusions.⁶

Mr. Machado-Erazo's motion rests on a fundamentally erroneous contention. Mr. Machado-Erazo argues that S.A. Magnuson's testimony derives from the premise "that a cell phone always connects to the closest cell tower at the time a call is placed." Def. Mot. at 6. However, the expert report submitted by S.A. Magnuson indicates that his conclusions are

⁵ The article offered by Mr. Machado-Erazo discusses *Evans* at length. See Def. Mot., Ex. B.

⁶ This Court also admitted similar expert testimony from a different FBI agent in *United States v. Pray*, 10-cr-51 (RMC).

derived from projecting a likely area from which a call was made, based on the specific tower (and antenna) to which a call connected. *See* Magnuson Report at 2. In his methodology, S.A. Magnuson obtains call data from the service provider that identifies which network tower and which antenna on that tower were utilized for any given call; he does not guess or estimate which cell tower or towers were in use. Then, “using a 120-degree pie shape and extending approximately 50% to 70% of the way to the nearest cell tower,” S.A. Magnuson maps “the sector of radio-frequency energy emanating from the antenna on the cell tower.” *Davis*, 2013 WL 2156659, at *5. As a caller moves around, his call would be handed off from cell tower antenna to cell tower antenna and can be traced accordingly by the service provider. Thus, using telephone company records, S.A. Magnuson reports that he is able to determine that a given cell phone, at a particular time, was in use within the 120-degree pie shape going out from the specific antenna on a specific tower.

Jones and *Davis*, as well as the many cases cited therein, demonstrate that this methodology employed by S.A. Magnuson clears the hurdle imposed by *Daubert* and Rule 702. Notably, the *Jones* defendant argued “that Agent Eicher’s methodology for determining the direction and size of the pie-shaped wedges [representing the direction of cell towers to which phones connected] is unreliable.” 2013 WL 246615 at *3. Judge Huvelle disagreed. She found that the government had shown that Agent Eicher’s methodology was reliable and that he had relied on sufficient facts and data. *Id.* at *3–4. She explained Agent Eicher’s methodology—which is substantially identical to S.A. Magnuson’s—as follows:

The records obtained pursuant to the court orders specify the cell tower and sector the cell phone connected to at the beginning and end of each call. Additionally, the cellular service providers release lists of their cell towers to law enforcement, including “the location of their cell towers, with GPS coordinates for each tower, and the specifications for each of the sectors of the towers.” By

combining those two resources, Agent Eicher plotted on a map the location of the precise cell tower and sector that the phones connected to for each phone call and the direction and width (i.e., 120°) of each sector.

Id. at *3–4 (citations omitted). Judge Huvelle also noted that “the use of cell phone location records to determine the general location of a cell phone has been widely accepted by numerous federal courts.” *Id.* at *3 (citing *United States v. Schaffer*, 439 F. App’x 344, 347 (5th Cir. 2011); *United States v. Dean*, No. 09 CR 446, 2012 WL 6568229, at *5 (N.D. Ill. Dec. 14, 2012); and *United States v. Fama*, No. 12–CR–186 (WFK), 2012 WL 6102700, at *3 (E.D.N.Y. Dec. 10, 2012)).

The defendant in *Jones* advanced relevance and Rule 403 challenges similar to those advanced by Mr. Machado-Erazo here. Judge Huvelle rejected both, finding that the testimony was not barred by Rule 403 because “the government has made it clear that Agent Eicher’s proposed testimony will not claim to have determined the exact location of the phone user, but rather the general location where a cell phone would have to be located to use a particular cell tower and sector.” *Id.* at *4 (internal quotation marks and citation omitted). She also rejected Mr. Jones’s argument that a *Daubert* hearing was required, again noting that “[t]he use of cell phone records to locate a phone has been widely accepted in both federal and state courts across the country” and that “the science is well understood and the issues [were] thoroughly briefed.” *Id.* at *5.

In *Davis*, Judge Robin Rosenbaum rejected a *Daubert* challenge to cell site analysis testimony to be offered by the same special agent here, S.A. Magnuson. Judge Rosenbaum ruled after a hearing at which S.A. Magnuson testified. She concluded that his methodology is reliable, based in part on his extensive testimony about cell towers and networks and his methods. *Davis*, 2013 WL 2156659, at *4–5. Judge Rosenbaum noted that S.A.

Magnuson’s method, using 120-degree pie shapes extending from the tower to “50% to 70% of the way to the nearest cell tower,” was tested and proven to be “very, very accurate.” *Id.* (internal citation and quotation marks omitted); *see also id.* (“[W]orldwide, the FBI has used [data revealing ‘actual radio-frequency footprints of the sectors’] to cross-check the accuracy of sector maps drawn using the techniques employed by Agent Magnuson.” (citations omitted)).

Mr. Machado-Erazo relies heavily on *Evans* from the Northern District of Illinois. On first reading, *Evans* appears to cast doubt on all cell site analysis. But closer reading demonstrates that the technique found objectionable in *Evans* was different from the techniques implicated in *Davis*, *Jones*, and this case. The testimony held unreliable and inadmissible in *Evans* was an agent’s claim that a cellular call came from a specific location at which a kidnapping victim was being held. The agent attempted to identify the location within a narrow area based on the *overlap* of coverage from two cell towers, using an analysis the witness and the *Evans* court called the “granulization theory.”⁷ *See Evans*, 892 F. Supp. 2d at 952 (“Special Agent Raschke testified that he could estimate the general location of Evans’s cell phone during an 18 minute period (from 12:54 p.m. to 1:12 p.m.) on April 24, 2010, during which time Evans’s phone used two cell towers to place nine calls. According to Special Agent Raschke, based on his estimate of the coverage area for each of the antennas”). In contrast, S.A. Magnuson would not testify about an overlap area; he would testify to the sectors within which a call must have occurred. *See Gov’t Opp.* at 2 n.1 (clarifying that S.A. Magnuson “will not claim to have determined the exact location of the phone user, but rather the general location where a

⁷ The *Evans* court never defined the “granulization theory,” so its precise meaning is unclear. A search for “granulization” in all state and all federal cases in a legal research database yields five results—*Evans*, *Davis*, *Jones*, and two unrelated cases that shed no light on the term. *E.g.*, *Little v. Kalo Labs., Inc.*, 406 So. 2d 678, 683 (La. Ct. App. 1981).

cell phone would have to be located to use a particular cell tower and sector”). Mr. Machado-Erazo’s reliance on *Evans* is thus unpersuasive.

Davis reached the same conclusion, rejecting the defendant’s reliance on *Evans* for two reasons. First, “other courts have reached the opposite conclusion of the *Evans* Court regarding the reliability of an agent’s methodology in estimating cell sectors where the agent used cell-phone records and his general knowledge and understanding of cellular phone networks and where the agent testified that he and others had used that methodology numerous times without error.” *Id.* at *6 (citations omitted). Second, S.A. Magnuson testified in *Davis* that “he was not aware of what [granulization theory] was and that he does not knowingly employ it.” *Id.* at *6 n.3. The *Jones* court used the same reasoning, also declining to rely on *Evans* to exclude an agent’s testimony on cell site analysis. *See* 2013 WL 246615 at *2 n.2. The *Jones* “defendant initially argued that Agent Eicher’s methodology was unreliable because he assumed that a cell phone always connects to the cell tower that is closest to it—an assumption defendant referred to as the ‘granulization’ theory.” *Id.* Because “the government clarified . . . that Agent Eicher does not rely on any such assumption,” the defendant withdrew his argument, and Judge Huvelle dismissed his reliance on *Evans* as “of no help, since [*Evans*] focused on the granulization theory.” *Id.* The government has offered the same clarification here, *see* Gov’t Opp. at 2 n.1, and the Court thus concludes that Mr. Machado-Erazo’s reliance on *Evans* is unavailing.

On the basis of the parties’ arguments, S.A. Magnuson’s reports, and *Davis* and *Jones*, as well as its own experience, the Court finds that S.A. Magnuson’s proposed expert “testimony is based on scientific knowledge” and is admissible under *Daubert*. *See Meister*, 267 F.3d at 1126 (internal citation and quotation marks omitted).

