[J-124-2016]
IN THE SUPREME COURT OF PENNSYLVANIA
MIDDLE DISTRICT

SAYLOR, C.J., BAER, TODD, DONOHUE, DOUGHERTY, WECHT, MUNDY, JJ.

COMMONWEALTH OF PENNSYLVANIA,	:	No. 74 MAP 2016
	:	
Appellant	:	Appeal from the Order of the York
	:	County Court of Common Pleas,
	:	Criminal Division, at No. CP-67-CR-
v.	:	0002400-2014 dated 2/10/15
	:	
	:	
JOEY WAYNE HERMAN,	:	
	:	
Appellee	:	ARGUED: December 7, 2016

OPINION

CHIEF JUSTICE SAYLOR **DECIDED: May 25, 2017**

This is a direct appeal by the Commonwealth in a case involving Appellee's alleged possession and delivery of a chemical compound claimed to be either a controlled substance or a designer drug. A central issue is whether the portions of the Controlled Substance, Drug, Device and Cosmetic Act under which Appellee was charged – relating to "analogues" of scheduled controlled substances, as well as "substantially similar" designer drugs – are unconstitutionally vague.

I. Background

At all relevant times, Appellee owned and operated a smoke shop in York County. On April 17, May 30, and July 11, 2013, undercover police officers entered the shop and purchased small packets of substances having brand names such as "Winter Haze" and "V-8 Air Freshener." Laboratory testing performed for the Commonwealth by

Michael Coyer, PhD – a forensic toxicologist and the Commonwealth's eventual expert witness – revealed that these products contained the chemical PB-22, which the prosecution alleged to be either a controlled substance as an "analogue" of the known synthetic cannabinoid JWH-018,[1] or a designer drug. On July 15, 2013, the police executed search warrants at Appellee's residence and business. At each location they seized additional packets of substances containing PB-22. Appellee was charged, under the Controlled Substance, Drug, Device and Cosmetic Act (the "Act"),[2] with three counts of delivery of a controlled substance, one count of possession with intent to deliver a controlled substance, and one count of possession, or possession with intent to distribute, a designer drug. *See* 35 P.S. §780-113(a)(30), (36).[3]

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[1] Synthetic cannabinoids are artificial compounds that mimic the effects of natural cannabinoids found in marijuana by interacting with the body's cannabinoid receptors, denominated as "CB1" and "CB2." *See generally United States v. Hossain*, 2016 WL 70583, *1 (S.D. Fla. Jan. 5, 2016) (sentencing order) (discussing the operation of synthetic cannabinoids in the human body). Information in the record suggests that the CB1 receptor is responsible for the body's psychoactive response, whereas the CB2 receptor "is associated with the immune system and is responsible for some of the proposed therapeutic qualities of cannabinoids." Report of Mark S. Erickson, PhD, at 1.

[2] Act of Apr. 14, 1972, P.L. 233, No. 64 (as amended 35 P.S. §§780-101 to 780-144).

[3] Those provisions state:

> (a) The following acts and the causing thereof within the Commonwealth are hereby prohibited:
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> * * *
>
> (30) . . . the . . . delivery, or possession with intent to . . . deliver, a controlled substance . . ..
>
> * * *
>
> (36) The knowing or intentional . . . possession with intent to distribute, or possession of a designer drug. . . .

35 P.S. §780-113(a)(30), (36).

Before describing the procedural history, it is helpful to review the legislation, including a material revision made in early July 2013, between the second and third undercover purchases. *See* Act of July 2, 2013, P.L. 242, No. 40 ("Act 40"). In relevant part, the Act defines a controlled substance as a substance listed in Schedules I through V of the Act. *See* 35 P.S. §780-102.[4] These are known as "scheduled" drugs. *See, e.g.*, 40 P.S. §908-1. It defines designer drug as "a substance other than a controlled substance that is intended for human consumption and that either has a chemical structure substantially similar to that of a controlled substance in Schedules I, II or III . . . or that produces an effect substantially similar to that of a controlled substance in Schedules I, II or III." 35 P.S. §780-102.[5] The schedules are set forth in the Act, *see* 35 P.S. §780-104, although only Schedule I is relevant to this dispute.[6]

Act 40 amended the description of Schedule I. In both the pre- and post-amendment timeframes, Schedule I included JWH-018 by name as a synthetic

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[4] The Secretary of Health has authority to add compounds to the schedules via regulation. *See* 35 P.S. §780-103. The schedules as thus augmented are set forth in the administrative code. *See* 25 Pa. Code §25.72. The parties do not suggest that any administrative additions to Schedule I are relevant to this case.

[5] The Commonwealth clarified at the preliminary hearing that, because controlled substances and designer drugs are mutually exclusive categories, its decision to lodge a designer-drug count against Appellee constituted a "fallback position" in the event PB-22 was found not to be a controlled substance. N.T., Apr. 14, 2014, at 50.

[6] The analogue and/or designer drug provisions in the Act appear to be a legislative response to underground laboratories which "have become adept at tinkering with the molecular structure of scheduled controlled substances while retaining the effects that those substances produce." *United States v. Carlson*, 2013 WL 5125434, at *27 (D. Minn. Sept. 12, 2013) (internal brackets, quotation marks, and citation omitted); *accord* Zunny Losoya, Comment, *Synthetic Drugs – Emergence, Legislation, and the Criminal and Legal Aftermath of Broad Regulation*, 66 SMU L. REV. 401, 403 (2013) (noting that synthetic drugs arise when chemists "slightly alter . . . existing banned drugs to evade the law and sell abusable drugs" (internal quotation marks and footnote omitted)).

cannabinoid. *See* 35 P.S. §780-104(1)(vii)(4) (2011); *id.* §780-104(1)(vii)(2)(B) (2013). In the pre-amendment version, Schedule I encompassed all "analogues" of the named synthetic cannabinoids. *See* 35 P.S. §780-104(1)(vii) (2011) (subsuming within Schedule I "[s]ynthetic cannabinoids or any material, compound, mixture or preparation which contains . . . the following substances, including their analogues . . .: . . . (4) JWH-018"). With the Act 40 revisions, Schedule I now encompasses compounds which are synthetic cannabinoids falling into thirteen specified "chemical designations," as well as analogues of those compounds. Thus, Schedule I now includes:

> Synthetic cannabinoids, including any material, compound, mixture or preparation that is not listed as a controlled substance in Schedules I, II, III, IV and V, . . . which contains any quantity of the following substances *[or] their . . . analogues, . . . whenever the existence of these . . . analogues . . . i[s] possible within the specific chemical designation* . . .

35 P.S. §780-104(1)(vii) (2013) (emphasis added).[7] Only the second specified chemical designation is potentially relevant to this matter:

> 2. Naphthoylindoles or any compound containing a 3-(-1-naphthoyl) indole structure with substitution at the nitrogen atom of the indole ring whether or not further substituted in the indole ring to any extent and whether or not substituted in the naphthyl ring to any extent. This shall include the following: . . . (B) JWH-018. . . .

Id. §780-104(1)(vii)(2)(B) (2013).[8] Notably, the Act has never provided a definition of "analogue" or, for the designer-drug provision, "substantially similar."

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[7] The text states "if possible" rather than "is possible." This is clearly a typographical error: "*if* possible" does not make grammatical sense, and all other subsections use the phrase "is possible," *see, e.g.*, *id.* §780-104(1)(i), as do counterpart statutes in other jurisdictions. *See, e.g.*, 21 U.S.C. §812; KY. REV. STAT. §218A.050.

[8] There is a fourteenth, "catchall," classification defined as "[a]ny other synthetic chemical compound that is a cannabinoid receptor type 1 [*i.e.*, CB1] agonist as demonstrated by binding studies and functional assays . . .." *Id.* §780-104(1)(vii)(14).

(continued…)

Appellee filed an omnibus pre-trial motion which included a request for *habeas corpus* relief. *See Commonwealth v. Hock*, 556 Pa. 409, 414-15 & n.2, 728 A.2d 943, 945 & n.2 (1999) (noting that a pre-trial *habeas* petition tests whether the Commonwealth's evidence is sufficient to make out a *prima facie* case of guilt). Appellee made several discreet assertions in support of his *habeas* request.

First, he argued that both controlled-substance charges relating to dates after July 2, 2013 – *i.e.*, the third delivery count and the possession count – should be dismissed because PB-22 is not a controlled substance under the revised Schedule I. Appellee reasoned that JWH-018 is a naphthoylindole, whereas PB-22 is an ester.[9] As the two compounds fall into different structural classes, Appellee maintained, PB-22 could not be an analogue of JWH-018 for purposes of the amended Section 780-104(1)(vii), given that that version expressly classifies prohibited synthetic cannabinoids by "specific chemical designation." 35 P.S. §780-104(1)(vii) (2013). In this regard, Appellee proffered that the statutory phrase, "within the specific chemical designation,"

(…continued)
Appellee maintained before the county court that the word "analogues" in Section 780-104(1)(vii) did not apply to the catchall category in light of the qualifier, "within the specific chemical designation." We will assume that is true for decisional purposes, as the Commonwealth does not presently argue that the catchall category is implicated. To the contrary, it concedes that no studies on the effects of PB-22 have been undertaken, *see* Brief for Appellant at 10, and hence, PB-22 has not been shown to be a CB1 agonist – *i.e.*, that it binds to the body's CB1 receptor and triggers a response.

[9] Both chemical types have common components, but PB-22 has an "oxygen bridge" (an extra oxygen atom bridging two of the main components), and two extra nitrogen atoms, which gives it different properties. *See* N.T., Nov. 7, 2014, at 22-26 (reflecting Dr. Coyer's description of the molecular structures of JWH-018 and PB-22). *See generally United States v. Johnson*, 2014 WL 7330936, at *5 (D. Nev. Dec. 19, 2014), *reprinted in* Brief for Appellant at app. 51a (showing two-dimensional diagrams of PB-22 and JWH-018). The parties' experts agreed that the chemicals are in different structural classes. *See* N.T., Nov. 7, 2014, at 47, 61.

id., should be understood to mean that the purported analogue must fall into the same structural classification. *See* Omnibus Pretrial Motion at 2-3. Notably, Appellee did not challenge the constitutional validity of the analogue provision in the revised statute.

Appellee also advanced that the sole designer-drug charge should be dismissed for two reasons. First, he argued that the Commonwealth failed to offer any evidence that PB-22 has a chemical structure which is substantially similar to that of JWH-018, and that the Commonwealth's own evidence, including Dr. Coyer's lab reports, indicated that the physiological and toxicological properties of PB-22 are unknown – thus negating any claim that its effects are substantially similar to those of JWH-018. *See* Omnibus Pretrial Motion at 5. Alternatively, Appellee argued that the term "substantially similar" was void for vagueness as applied to the two compounds in question. *See id.*

Finally, Appellee argued that, in the relevant scientific field, there is no consensus as to the definition of an "analogue" of a chemical compound, nor is there a generally-accepted methodology for determining whether one molecule is an analogue of another. As applied to this case, Appellee reasoned that, if scientists cannot agree on whether PB-22 is an analogue of JWH-018, the average citizen could not be on notice of such a relationship between the two chemicals and, therefore, that PB-22 is an illegal drug. That being the case, Appellee continued, it would offend due process, under the void-for-vagueness doctrine, for the Commonwealth to prosecute him under subsection 780-113(a)(30) for delivering PB-22 as an alleged controlled substance in the pre-July 2, 2013, timeframe. *See id.* at 3-4.[10]

[10] Appellee also sought a hearing pursuant to *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), to test whether the method used by the Commonwealth's expert to conclude PB-22 is an analogue of, and has a substantially-similar chemical structure to, JWH-018, is generally accepted in the relevant scientific field. Although the hearing on the *habeas* motion delved into those questions, it was not a *Frye* hearing, as it did not pertain to the admissibility of the prosecution's evidence. The issue before the court (continued…)

To summarize, then, Appellee made three essential contentions: (1) that Section 780-104(1)(vii) was vague as applied to PB-22 before July 2, 2013; (2) that PB-22 was not a prohibited substance under Section 780-104(1)(vii) after July 2, 2013; and (3) that the designer-drug provision, Section 780-113(a)(36), could not validly be applied to PB-22. Because subsection (a)(36) predicates culpability in the disjunctive on a substantially similar effect *or* chemical structure, this latter argument had two subparts: (a) since PB-22's effects were unknown, they could not possibly be proved to be substantially similar to those of JWH-018; and (b) either the Commonwealth did not satisfy its burden to demonstrate that PB-22 and JWH-018 shared a substantially similar chemical structure, or the term "substantially similar" was vague as applied to the structures of those two chemicals.

The common pleas court held a hearing on the *habeas* motion at which Dr. Coyer testified as an expert for the Commonwealth and two expert witnesses testified on behalf of Appellee. Dr. Coyer opined, to a reasonable degree of scientific certainty, that PB-22 is an analogue of JWH-018. *See* N.T., Nov. 7, 2014, at 35. He conceded,

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(…continued)
was whether the provisions of the Act under which Appellee was charged were inapplicable under the circumstances or unconstitutionally vague as applied. Further, the court never made a preliminary finding that the science involved was novel. *See* N.T., Nov. 7, 2014, at 45. *See generally Commonwealth v. Puksar*, 597 Pa. 240, 253, 951 A.2d 267, 275 (2008) (observing that *Frye* only applies to "proffered expert testimony involving novel science" (internal quotation marks and citations omitted)).

This is not entirely a formal distinction. The proponent of novel scientific evidence has the burden of establishing all prerequisites to admission, including conformance with *Frye*, *see Grady v. Frito-Lay, Inc.*, 576 Pa. 546, 558, 839 A.2d 1038, 1045 (2003), whereas the party advancing a constitutional challenge to a statute bears the burden of demonstrating a constitutional violation. *See Clifton v. Allegheny Cnty.*, 600 Pa. 662, 702, 969 A.2d 1197, 1221 (2009). Overall, however, the Commonwealth shoulders the burden to show evidentiary sufficiency for purposes of a pre-trial *habeas* motion. *See Commonwealth v. Prosdocimo*, 331 Pa. Super. 51, 52, 479 A.2d 1073, 1074 (1984).

however, that there was no definition of "analogue" in the relevant scientific field, but that he considered the term to mean a compound which "has a similar structure but may possess different properties." *Id.* at 36. In terms of methodology, Dr. Coyer indicated that he used a four-part process to arrive at this type of expert opinion: he visually compared two-dimensional diagrams of the molecules in question; he compared their potency or function; he reviewed his colleagues' unpublished reports, anecdotal evidence, and peer-reviewed articles, if any; and he drew upon his experience conducting chemical analyses in his capacity as a forensic toxicologist. *See id.* at 40-42. However, Dr. Coyer was unable to identify any peer-reviewed articles suggesting that his methodology was a generally-accepted means for determining whether one compound is an analogue of another. Finally, he clarified that his method did not employ a comparison of three-dimensional molecular illustrations. *See id.* at 51.

Appellee's first expert witness was John W. Huffman, PhD, an organic chemist and professor emeritus at Clemson University who had been active in the cannabinoid field for decades. Dr. Huffman, for whom JWH-018 is named, created the compound when conducting federally-funded research into how such chemicals interact with the body's cannabinoid receptors. He agreed with Dr. Coyer that there was no scientific definition of "analogue" and that PB-22 and JWH-018 were in different structural classes. *See id.* at 61, 81-82. Therefore, Dr. Huffman opined that the two compounds were not analogues and did not have similar structures. *See id.* at 90-91. Referring to a peer-reviewed scientific paper, Dr. Huffman also noted, consistent with Dr. Coyer's lab reports, that scientists had no knowledge of PB-22's pharmacological or toxicological effects, or of whether the two chemicals have similar effects. That being the case, he continued, there was no agreement in the scientific community on whether PB-22 could properly be classified as a synthetic cannabinoid, *see id.* at 83-84, notwithstanding that

one team of chemists had labeled it as such "a few years ago." *Id.* at 84. Dr. Huffman stated that he had never heard of anyone else using Dr. Coyer's four-part technique for discerning whether one molecule is an analogue of another. He testified that such methodology was not generally accepted in the scientific field, particularly as three-dimensional modeling, not two-dimensional diagraming, was the accepted standard for comparative analysis of molecular structures. *See id.* at 76-77, 81-82.

Appellee also presented the expert testimony of Heather Harris, PhD, a forensic analytical chemist and chair of the Structure Subcommittee of the Advisory Committee for the Evaluation of Controlled Substance Analogues ("ACECSA"), a national scientific body. Dr. Harris explained that the mission of ACECSA – which also includes members of law enforcement agencies – is to develop methods for forensic chemists to use in discerning whether one chemical is an analogue of another. She testified that ACECSA had not yet developed such a methodology. *See id.* at 96. Dr. Harris also discussed an entity funded by the federal Drug Enforcement Agency called the Scientific Working Group for the Analysis of Seized Drugs ("SWGDRUG"), which publishes recommendations for chemists involved in testing controlled substances. She noted SWGDRUG includes an analogue subcommittee which had as yet been unable to devise a methodology for determining whether a particular chemical is an analogue of a controlled substance. *See id.* at 97-98. Dr. Harris additionally related that she had recently reviewed the scientific literature. Based on that review, she opined that Dr. Coyer's comparison methodology was not generally accepted in the scientific field. She added that she had been unable to locate any generally-accepted methodology. As well, Dr. Harris testified that there is also no commonly-accepted scientific definition of the phrase "substantially similar," which she viewed to be a subjective term. Ultimately,

she rendered her own professional opinion, to a reasonable degree of scientific certainty, that PB-22 and JWH-018 are not substantially similar. *See id.* at 102.

The common pleas court granted Appellee's *habeas* motion and dismissed all charges against him.[11] In its Rule 1925(a) opinion, the court relied largely on the testimony of Drs. Hoffman and Harris. Based on such proofs, as well as portions of Dr. Coyer's testimony, the court determined that the public at large could not have been on notice that PB-22 was prohibited as either an analogue of JWH-018 or a compound with a chemical structure or effect substantially similar to that of JWH-018. The court thus found the relevant portions of the Act unconstitutionally vague as applied to PB-22. As such, it concluded that the Commonwealth had failed to make out a *prima facie* case because it could not show that the products in question were prohibited substances under the Act. *See Commonwealth v. Herman*, No. CP-67-CR-2400-2014, *slip op.* at 8-9 (C.P. York May 28, 2015). *See generally Commonwealth v. McBride*, 528 Pa. 153, 157-58, 595 A.2d 589, 591 (1991) (observing that, to make out a *prima facie* case, the government must demonstrate a crime was committed, probably by the accused).[12]

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[11] Appellee had also been charged with criminal conspiracy and dealing in the proceeds of unlawful activities. *See* 18 Pa.C.S. §§903(a), 5111(a)(1). We need not discuss those counts separately as their viability depends on that of the drug charges at the center of this case.

[12] The court also briefly discussed *Frye* and indicated that Dr. Coyer's evidence was not generally accepted in the scientific community. *See Herman*, No. CP-67-CR-2400-2014, *slip op.* at 10-11. This aspect of the opinion can be read to suggest that the court, in retrospect, viewed the proceeding as a *Frye* hearing, at least in part. As explained, though, the court did not find preliminarily that the scientific evidence was novel, nor did it indicate the admissibility of Dr. Coyer's testimony was in issue. *See supra* note 10.

Separately, the court did not address Appellee's statutory argument that PB-22 was legal under Act 40. As the court had already found "analogue" to be unconstitutionally vague – a question it could not avoid relative to charges based on conduct occurring in the pre-Act 40 timeframe – it may have seen no need to address that claim.

The county court's decision is now on direct appeal to this Court. *See* 42 Pa.C.S. §722(7) (giving this Court exclusive appellate jurisdiction of common pleas court decisions ruling a statute unconstitutional).[13] At the heart of that decision is the court's holding that the Act is unconstitutionally vague as applied to PB-22.

Presently, the Commonwealth argues that the common pleas court erred in granting relief based on a judicial finding that the terms "analogue" and "substantially similar" were unconstitutionally vague as applied. The Commonwealth maintains that the expert witnesses all confirmed that the two compounds, JWH-018 and PB-22, had structurally similar molecular components, albeit they differed regarding whether the two chemicals were sufficiently similar to meet statutory requirements. In the Commonwealth's view, whether they are sufficiently alike to be considered "substantially similar" or "analogues" is a question of fact for the jury to determine upon hearing expert testimony from both sides.[14] In this regard the Commonwealth urges that statutory words should be understood according to their common usage, *see* Brief for Appellant at 16 (quoting 1 Pa.C.S. §1903(a)), and that, here, the dictionary defines "analogue" as "[o]ne of a group of chemical compounds similar in structure but different in composition," *id.* (quoting RANDOM HOUSE WEBSTER'S COLLEGE DICTIONARY 47 (2d ed. 2001)) – a definition that juries can comprehend and apply.

Finally, the Commonwealth points to three unpublished United States District Court decisions rejecting a void-for-vagueness claim in situations where the defendants

[13] The Commonwealth initially appealed to the Superior Court. Upon recognizing the underlying constitutional basis for the common pleas court's decision, the intermediate court transferred the matter here. *See Commonwealth v. Herman*, 143 A.3d 392, 394 (Pa. Super. 2016); Pa.R.A.P. 751 (relating to the transfer of erroneously-filed cases).

[14] The Commonwealth's designer-drug argument rests solely on the premise that a jury could find that the two compounds have a substantially similar chemical structure, rather than substantially similar effects. *See supra* note 8.

were charged under the federal Analogue Act, and the chemicals at issue were PB-22 and JWH-018, or some variant of them. *See United States v. Hoyt*, 2014 WL 5023093 (W.D. Va. Oct. 8, 2014), *reprinted in* Brief for Appellant at app. 27a; *United States v. Bays*, 2014 WL 3764876 (N.D. Tex. July 31, 2014), *reprinted in* Brief for Appellant at app. 34a; *United States v. Johnson*, 2014 WL 7330936 (D. Nev. Dec. 19, 2014), *reprinted in* Brief for Appellant at app. 47a.[15] It adds that a number of other jurisdictions have concluded that the terms "analogue" and "substantially similar" are not void for vagueness when applied to other controlled substances. *See* Brief for Appellant at 20-23 (citing cases). The Commonwealth maintains that these other decisions provide guidance and additionally militate in favor of reaching the same conclusion to maintain uniformity across jurisdictions. *See id.* at 18 (quoting 1 Pa.C.S. §1927 ("Statutes uniform with those of other states shall be interpreted and construed to effect their general purpose to make uniform the laws of those states which enact them.")).

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[15] The federal Analogue Act is a 1986 addition to the Controlled Substances Act, 21 U.S.C. §§801-971 (the "Federal CSA"), which prescribes that controlled substance analogues "shall, to the extent intended for human consumption, be treated, for the purposes of any Federal law as a controlled substance in schedule I." *Id.* §813.

The Federal CSA defines a "controlled substance analogue" generally as a substance whose chemical structure is substantially similar to that of a schedule I or II controlled substance, and either: (a) "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 (b) "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). *See generally United States v. Turcotte*, 405 F.3d 515, 522-23 (7th Cir. 2005) (construing the statute).

II. Analysis

A. The void-for-vagueness doctrine

The concept of unconstitutional vagueness arises from due process norms. *See* U.S. CONST. amends. V, XIV; *Welch v. United States*, ___ U.S. ___, ___, 136 S. Ct. 1257, 1261-62 (2016) (observing that the void-for-vagueness doctrine is grounded in the Fifth Amendment with regard to the federal government, and the Fourteenth Amendment with regard to the States). It prevents the government from imposing sanctions under a criminal law that fails to give fair notice of the proscribed conduct. *See Johnson v. United States*, ___ U.S. ___, ___, 135 S. Ct. 2551, 2556 (2015) (citing *Kolender v. Lawson*, 461 U.S. 352, 357-58, 103 S. Ct. 1855, 1858 (1983)); *see also Papachristou v. City of Jacksonville*, 405 U.S. 156, 162, 92 S. Ct. 839, 843 (1972) ("Living under [the] rule of law entails various suppositions, one of which is that '[all persons] are entitled to be informed as to what the State commands or forbids.'" (quoting *Lanzetta v. New Jersey*, 306 U.S. 451, 453, 59 S. Ct. 618, 619 (1939) (second alteration in original))). Relatedly, the doctrine safeguards against arbitrary or discriminatory enforcement by the government, *see FCC v. Fox Television Stations, Inc.*, 567 U.S. 239, ___, 132 S. Ct. 2307, 2317 (2012), as well as jury verdicts "unfettered by any legally fixed standards as to what is prohibited by the statute." *State v. Golston*, 67 So. 3d 452, 463 (La. 2011). Still, due process recognizes that because we are "[c]ondemned to the use of words, we can never expect mathematical certainty" in legislative draftsmanship. *Grayned v. City of Rockford*, 408 U.S. 104, 110, 92 S. Ct. 2294, 2300 (1972). Ultimately, the inquiry is whether the law "forbids or requires the doing of an act in terms so vague that [persons] of common intelligence must necessarily guess at its meaning and differ as to its application[.]" *Connally v. Gen. Constr. Co.*, 269 U.S. 385, 391, 46 S. Ct. 126, 127 (1926).

Where, as here, a vagueness challenge does not involve First Amendment freedoms, it is "examined in the light of the facts of the case at hand," *United States v. Powell*, 423 U.S. 87, 92, 96 S. Ct. 316, 319 (1975) (internal quotation marks and citation omitted), and "the statute is judged on an as-applied basis." *Maynard v. Cartwright*, 486 U.S. 356, 361, 108 S. Ct. 1853, 1858 (1988); *Commonwealth v. Heinbaugh*, 467 Pa. 1, 5, 354 A.2d 244, 245 (1976). Thus, we consider the record developed in the common pleas court and evaluate whether Appellee met his burden to demonstrate that the statutory terms in question are unconstitutionally vague as applied to the chemicals JWH-018 and PB-22. In doing so, we bear in mind that statutes enjoys a strong presumption of validity and will only be declared void if they clearly and plainly violate the Constitution, with all doubts resolved in favor of a finding of constitutionality. *See Commonwealth v. Bullock*, 590 Pa. 480, 487, 913 A.2d 207, 211-12 (2006). *See generally In re Adoption of E.M.A.*, 487 Pa. 152, 155, 409 A.2d 10, 11-12 (1979) (noting that this presumption pertains in an as-applied vagueness challenge), *superseded by statute on other grounds*, 23 Pa.C.S. §2701(7); *In re Adoption of R.B.F.*, 569 Pa. 269, 281, 803 A.2d 1195, 1202 (2002). We defer to the common pleas court's findings of fact that are supported by the record, but we review questions of law – including the Act's constitutionality – *de novo*. *See Commonwealth v. Davidson*, 595 Pa. 1, 11, 938 A.2d 198, 203 (2007).

B. The controlled-substance analogue counts prior to Act 40

As most of the charges against Appellee involve the claim that PB-22 is a chemical analogue of JWH-018, and the bulk of the pre-trial hearing testimony related to the term "analogue," we first question whether the Act's use of the term prior to the Act

40 amendments was unconstitutionally vague as applied to those two chemicals.[16] As an initial matter, although the federal Analogue Act defines "analogue" in terms of a substantially similar chemical structure, *see* 21 U.S.C. §802(32)(A)(i), and a number of our sister States have legislation containing a similar definition of a controlled substance analogue, *see, e.g.*, CAL. HEALTH & SAFETY CODE §11401(b); COLO. REV. STAT. §18-18-102(6); 720 ILL. COMP. STAT. 570/401; KAN. STAT. §§65-4101(g), 21-5701(b); LA. REV. STAT. §40:961(8); OHIO REV. CODE §3719.01(HH); TEX. HEALTH & SAFETY CODE §§481.002(6), 481.102, the Pennsylvania enactment provides no such definition or any other express guidance. Additionally, the Act defines designer drugs in such terms and clarifies that designer drugs are not within the set of chemicals which constitute controlled substances. *See* 35 P.S. §780-102. Thus, although many jurisdictions appear to equate controlled substance analogues with a certain group of compounds whose chemical structure is substantially similar to that of the controlled substance in question, this type of equivalence is not reasonably supported by the express terms of the Act.

Such a lack of guidance would not be especially problematic if an accepted meaning of the word "analogue" existed within the relevant scientific community, or if there was general acceptance that PB-22 is, in fact, an analogue of JWH-018. However, the expert testimony for both parties at the *habeas* hearing confirmed that there is no widely accepted definition of the term "analogue" as applied to these types of

[16] If the common pleas court had found as a fact that PB-22 was not an analogue of JWH-018, we could potentially avoid this constitutional issue by deferring to that finding. However, the court made no such finding and, moreover, Dr. Coyer opined that PB-22 was an analogue of JWH-018. *See* N.T., Nov. 7, 2014, at 35. That testimony must be accepted as true for the narrow purpose of ascertaining whether the Commonwealth made out a *prima facie* case. *See Commonwealth v. MacPherson*, 561 Pa. 571, 585, 752 A.2d 384, 391 (2000). This, in turn, forecloses the possibility that we can affirm the court's order based on an appellate finding that PB-22 is not an analogue of JWH-018.

organic molecules. *See* N.T., Nov. 7, 2014, at 34-35 (testimony of Dr. Coyer); *id.* at 82 (testimony of Dr. Huffman). The testimony also established that JWH-018 and PB-22 are in different structural classes, *see supra* note 9, and Dr. Huffman testified that chemicals in different structural classes are not analogues of one another – and that, specifically, PB-22 is not an analogue of JWH-018. *See id.* at 90-91. Dr. Huffman did clarify on cross-examination that the more particularized term "structural analogue" is sometimes used to refer to compounds that can be synthesized from a common parent molecule, and that the phrase can also refer to chemicals with the same basic molecular structure. *See id.* at 88. And Dr. Coyer opined that PB-22 is an analogue of JWH-018 insofar as its structure is concerned. *See id.* at 35-37. As to whether PB-22 is a synthetic cannabinoid in terms of mimicking the effects of known cannabinoids, however, Dr. Coyer was only able to state that some "initial testing may have been done" to ascertain its effects as such, *id.* at 37, and that in informal conversations some chemists group PB-22 together with JWH-018. *See also id.* at 38 (explaining that there was "a talk" focusing on whether a group of new compounds, including PB-22, were synthetic cannabinoids, but he did not wish to speak about that talk because it was only "a meeting").

Particularly in light of the admitted lack of scientific studies as to PB-22's effects within the body, we find this type of evidence to be insufficient to establish that there is any agreement in the scientific community that PB-22 is a known synthetic cannabinoid. Moreover – and more to the point – it appears there is no scientifically accepted method for ascertaining whether PB-22 is an analogue of JWH-018. In this respect, Appellee's second expert, Dr. Harris, was in a unique position to know whether, from a legal perspective, scientists are aware of any methodology to determine whether a compound under investigation can be considered an analogue of a controlled substance. She

belonged to ACECSA, a national scientific committee specially dedicated to discovering or fashioning such methods for law enforcement agencies to use. Dr. Harris testified that, as of the date of the hearing, ACECSA had not yet devised such a method. *See id.* at 96. She added that SWGDRUG's analogue subcommittee had been similarly unable to formulate any such methodology, ultimately concluding that "it comes down to a subjective determination dependent not only upon what you are evaluating, but also the experience within [sic] the molecule itself." *Id.* at 97.

Under these circumstances, we find resonance in the argument Appellee made in his *habeas* motion suggesting that scientists in the relevant field have not been able to agree on a method to determine analogue status and cannot agree on whether PB-22 is an analogue of JWH-018 – and if that is true of scientists, it is difficult to see how the average citizen can be on notice of such status. The court in *United States v. Forbes*, 806 F. Supp. 232 (D. Colo. 1992), faced a similar situation with regard to alphaethyltryptamine ("AET"), which the government claimed was a controlled-substance analogue of the scheduled drugs dimethyltryptamine ("DMT") and diethyltryptamine ("DET"). After hearing pre-trial expert testimony from both sides not unlike that adduced in the present case, the court stated that "[t]he scientific community *cannot even agree on a methodology* to use" to determine analogue status under the federal statute. *Id.* at 237 (emphasis added). Thus, the court concluded, "a defendant cannot determine [such status] in advance of his contemplated conduct[.]" *Id.*

The same observations apply to the question of whether PB-22 is an analogue of JWH-018 under the Act (at least prior to its Act 40 revisions). The average citizen would necessarily have to "guess at" PB-22's status and "differ as to [the] application" of the analogue prohibition contained in Section 780-104(1)(vii). *Connally*, 269 U.S. at 391, 46 S. Ct. at 127. Consequently, we agree with Appellee and the common pleas

court that the pre-Act 40 statute was unconstitutionally vague as applied to PB-22 and JWH-018.[17]

Nor are we persuaded by the Commonwealth's assertion that the vagueness question can be dispensed with by characterizing as a jury question whether PB-22 is an analogue of JWH-018. We need not address whether PB-22's analogue status could theoretically be a question for the fact-finder if the Act were constitutional. The point here is that the Commonwealth's argument starts from the assumption that the act is not vague as applied to PB-22, which is the very issue before this Court.

We also differ with the government's suggestion that because the Act is part of a uniform law, Section 1927 of the Statutory Construction Act directs that it be construed uniformly with similar laws of other jurisdictions. Although the Act is based on the Uniform Controlled Substances Act of 1970, *see* 35 P.S. Ch. 6, Table, Section 1927 does not necessarily apply. For one thing, neither the Act's title nor its provisions suggest an intention to conform Pennsylvania's drug regulations to those of other jurisdictions. *See Allegheny Cnty. v. Rendell*, 580 Pa. 149, 166 n.6, 860 A.2d 10, 21 n.6 (2004) (explaining that Section 1927 only pertains where the substantive language of the enactment indicates that it is "part of a uniform enactment among several states"). Just as important, many states have now adopted a later version of the uniform act which was revised to include a definition of "controlled substance analog" which is expressed in terms of substantial similarity to a controlled substance, *see* UNIF.

[17] We pause to emphasize that the problem is made acute by the specific wording of the Act. Unlike legislatures elsewhere, the General Assembly has placed the substantial-similarity test – which would ordinarily comprise the most probable standard for determining analogue status – within the designer drug provision, and has clarified that designer drugs and controlled substances (including analogues) are mutually exclusive categories. *See supra* note 5. It has done so, moreover, without delineating any substitute standard for determining what constitutes an analogue.

CONTROLLED SUBSTANCES ACT §101(3) (1990) – in other words, which tracks the Act's definition of a designer drug. *See supra* note 17. Other state decisions, such as those highlighted by the Commonwealth, are based on the 1990 definition and, as such, do not support the Commonwealth's uniformity argument relative to the Act's "analogue" provision. *See, e.g.*, *People v. Lucero*, 381 P.3d 436, 440 (Colo. App. 2016); *State v. Barnes*, 64 P.3d 405, 408 (Kan. 2003); *State v. Smith*, 525 N.W.2d 264, 267 (Wis. 1995). *See generally* Richard L. Braun, *Uniform Controlled Substances Act of 1990*, 13 CAMPBELL L. REV. 365, 367 (1991) (confirming that the 1990 uniform act's controlled-substance analogue provision was drafted to encompass designer drugs).

Finally, and as noted, the Commonwealth highlights several federal decisions, including three United States District Court opinions, which hold that, under the federal Analogue Act, PB-22 is an analogue of JWH-018. However, those disputes do not purport to address the salient issue before this Court because, as with the 1990 version of the uniform act, they relate to the federal Analogue Act's definition of a "controlled substance analogue" as a chemical having a substantially similar chemical structure to a scheduled drug. *See* 21 U.S.C. §802(32)(A)(i). Their present relevance, if any, is thus limited to the designer-drug charge (discussed below) as the Act defines designer drug in similar terms, but it provides no definition of "analogue."

Accordingly, we hold that in the pre-Act 40 timeframe the analogue provision was unconstitutionally vague as applied to PB-22 as an alleged analogue of JWH-018. That being the case, the common pleas court acted properly in dismissing the charges lodged against Appellee based on the April and May 2013 undercover purchases.

C. The controlled-substance analogue counts after Act 40

Appellee was also charged with delivery of a controlled substance (PB-22) based on the July 11, 2013, undercover purchase, and with a possession with intent to deliver

a controlled substance based on the July 15, 2013, packet seizures. Both of those charges were lodged pursuant to the Act as amended by Act 40. As explained, Appellee never claimed in his *habeas* motion that the amended statute's use of the term "analogue" was unconstitutionally vague as applied. Rather, he maintained that PB-22 was not a prohibited substance inasmuch as it was excluded from Schedule I due to the statute's use of specific chemical designations. He asserted, in this respect, that PB-22 is not in any of the listed designations, and specifically, is not the same chemical designation as JWH-018. *See* N.T., Nov. 7, 2014, at 32-33, 108-10 (reflecting defense counsel's repetition at the *habeas* hearing of this non-constitutional, interpretive basis for challenging the post-July 2 controlled-substance charges). On appeal, Appellee continues to forward this same argument as his only contention with regard to these charges. *See* Brief for Appellee at 4-8.[18]

As described above, the statutory description of Schedule I cannabinoids as stated in the revised Act only prohibited certain chemicals and their analogues within thirteen enumerated chemical designations – the relevant one being naphthoylindoles inasmuch as it includes JWH-018, *see* 35 P.S. §780-104(1)(vii)(2)(B) (2013) – and a "catchall" category of CB1 agonists, which is not presently relevant. *See supra* note 8. The prosecution's expert confirmed that PB-22 is in a different chemical classification than JWH-018, and that it falls within a class of compounds known as indole carboxylic acids rather than naphthoylindoles. *See* N.T., Nov. 7, 2014, at 47. This has now been confirmed by the General Assembly in its most recent revision to the Act, *see* Act of

[18] The common pleas court did not speak to this issue in its Rule 1925 opinion. Instead, it held that the term "analogue" was vague as applied without distinguishing between the pre- and post-amendment versions of the statute. Additionally, the Commonwealth does not address the claim in its brief, opting instead to limit its advocacy to the position that the terms "analogue" and "substantially similar" should not be deemed unconstitutionally vague.

June 8, 2016, P.L. 258, No. 37 ("Act 37"), in which the legislative body named PB-22 as a scheduled controlled substance under that very chemical designation. *See* 35 P.S. §780-104(1)(vii)(2.2) (2016) (listing PB-22 as one of a group of Schedule I controlled substances within the chemical designation "[i]ndole carboxylic acids").

Accordingly, the Commonwealth failed to identify a valid statutory basis on which Appellee could be charged with delivery of a controlled substance, or possession with intent to deliver a controlled substance, based his conduct after July 2, 2013. We therefore affirm the common pleas court's dismissal of the relevant counts against Appellee, although we disagree with its analysis insofar as it suggested that the post-amendment Act's use of "analogue" is unconstitutionally vague.[19] *See Commonwealth v. Flanagan*, 578 Pa. 587, 611, 854 A.2d 489, 503 (2004) (explaining that "this Court has the ability to affirm a valid judgment or order for any reason appearing as of record"). By reaching our holding on these grounds, we not only resolve Appellee's claim on the terms in which he has framed it, we also "adhere to the sound tenet of jurisprudence that courts should avoid constitutional issues when the issue at hand may be decided upon other grounds." *In re Fiori*, 543 Pa. 592, 600, 673 A.2d 905, 909 (1996) (citing *Rescue Army v. Mun. Court*, 331 U.S. 549, 568-69, 67 S. Ct. 1409, 1419-20 (1947)); *accord Threlkeld v. State*, 558 S.W.2d 472, 474 (Tex. Crim. App. 1977) ("This Court will not pass on the [constitutional] validity of any part of the Controlled Substances Act which is not shown to have been violated[.]" (citation omitted)).

D. The designer-drug count and the "substantially similar" descriptor

Finally, Appellee was charged with a single count of possession with intent to distribute, or possession, of a designer drug. To review, the Act prohibits the "knowing

[19] That issue will have to await another dispute where its resolution is material to the outcome of the case.

or intentional . . . possession with intent to distribute, or possession[,] of a designer drug," 35 P.S. §780-113(a)(36); *see supra* note 3, which is defined in relevant part as "a substance other than a controlled substance that is intended for human consumption and that . . . has a chemical structure substantially similar to that of a controlled substance in Schedules I, II or III . . . or that produces an effect substantially similar to that of a controlled substance in Schedules I, II or III." *Id.* §780-102.[20]

Before the common pleas court, Appellee claimed an entitlement to *habeas* relief on this charge solely on the basis that the "substantially similar" descriptor was vague. The common pleas court agreed with Appellee and expressed its rationale in succinct terms. The court found that "experts have been unable to reach an agreement on a method for analyzing and determining the similarities between the chemical structures . . . of PB-22 and JWH-018." *Herman*, No. CP-67-CR-2400-2014, *slip op.* at 9. It concluded that "[t]his disagreement renders the designer drug statute unconstitutionally vague." *Id.* In his appellate brief, Appellee only argues that that the *effects* of PB-22 are unknown, *see* Brief for Appellee at 8-9, which is not in dispute. Appellee appears to overlook that, unlike the federal CSA, the Act's definition of designer drug is phrased in the disjunctive. Thus, he may still be liable under Section 780-113(a)(36) if PB-22's chemical structure is substantially similar to that of JWH-018. The salient issue is whether that term – "substantially similar" – is vague as applied to the chemical structures of PB-22 and JWH-018.

Although the bulk of the testimony at the *habeas* hearing focused on the term "analogue," the county court's finding that experts disagree on a method for determining

[20] As of June 2016, PB-22 is not a designer drug because Act 37 made it a scheduled controlled substance. *See* 35 P.S. §780-104(1)(vii)(2.2) (2016). For present purposes, we apply the Act as it existed on July 15, 2013, when the PB-22 packets were seized.

substantial similarity as between chemical structures is supported by the record.[21] Initially, the experts agreed that, although the overall molecular structures of the two chemicals were different, they had similar components. *See* N.T., Nov. 7, 2014, at 25, 38-39 (testimony of Dr. Coyer), 85-86 (testimony of Dr. Huffman). Dr. Coyer went further and opined that their components were "very similar," *id.* at 25, and his testimony as a whole was acknowledged by Appellee as subsuming an expression that the overall molecular structures were substantially similar. *See id.* at 99. The defense experts disagreed. Dr. Huffman opined that the two molecules did not have "similar structures," *id.* at 91; *see also id.* at 86 ("[T]he total structures are different."), and Dr. Harris indicated that they were not "structurally similar as a whole." *Id.* at 99. Just as important, both defense experts highlighted the importance of three-dimensional comparisons in reaching a conclusion on structural similarity. *See id.* at 77 (Dr. Huffman), 100 (Dr. Harris). Dr. Harris continued by expressing that "substantially similar" is not a scientific term and "substantial" means different things to different people. *Id.* at 101.

We have difficulty, however, with the common pleas court's ultimate holding. While the term "analogue" may be somewhat nebulous (particularly in a scientific setting), the concept of similarity is well known to persons of ordinary intelligence, and we see no reason why such individuals would have difficulty applying it to evidence of the molecular structures of PB-22 and JWH-018. *Accord United States v. McKinney*, 79

[21] Dr. Harris' testimony regarding efforts at the federal level to discover a methodology for ascertaining whether one chemical is an analogue of another can be construed as touching on the question of substantial similarity in light of the federal Analogue Act's use of that term in its definition of a controlled substance analogue. However, it cannot be seen as addressing *only* chemical-structure similarity, since the federal definition also includes a requirement that the effects on the central nervous system be substantially similar.

F.3d 105, 108 (8th Cir. 1996) (rejecting a claim that the federal Analogue Act's use of "substantially similar" was vague, and explaining that "a reasonable layperson could . . . have examined a chemical chart and intelligently decided for himself or herself, by comparing their chemical diagrams, whether the chemical structures of the two substances were substantially similar"), *judgment vacated on other grounds*, 520 U.S. 1226, 117 S. Ct. 1816 (1997). The fact that the parties' experts disagreed on the ultimate issue of substantial similarity in this case is not dispositive, particularly given the obvious visual similarities in the two-dimensional diagrams of the molecules.[22] *Accord United States v. Klecker*, 348 F.3d 69, 72 (4th Cir. 2003) (where diagrams of the two molecules at issue revealed "considerable similarities," holding that the "substantially similar" standard was not vague as applied notwithstanding that the parties' experts disagreed on the question of whether they were substantially similar). The "substantial" qualifier speaks to the degree of similarity needed to bring a substance within the designer drug prohibition. Still, "substantial similarity" is not a scientific concept, *accord Controlled Substance Analogues* 4, and although that adjective may be qualitative, the Supreme Court has stressed that it does not "doubt the

[22] The statute does not articulate a particular manner of proof. As such, it does not require that substantial similarity be proved by two-dimensional diagrams, nor does it preclude proof by three-dimensional diagrams, models, holograms, or indeed any other evidence pertinent to the issue. In this regard, some commentators have expressed that two-dimensional stick-and-letter chemical structure diagrams are an inferior type of evidence, as they omit relevant information such as atomic mass and the three-dimensional structure. *See* Paul Anacker & Edward J. Imwinkelried, *The Confusing World of the Controlled Substance Analogue (CSA) Criminal Defense*, 42:6 CRIM. L. BULL. ART. 4 (2006) (hereinafter, "*Controlled Substance Analogues*"); *cf. Bays*, 2014 WL 3764876, at *8 (referring with approval to expert testimony suggesting that two-dimensional chemical models are useful for determining core structure, whereas three-dimensional models are helpful in identifying attached functional groups and seeing how they are similar). Whether evidentiary sufficiency to prove guilt can be predicated solely on comparing two-dimensional diagrams is not an issue presently before the Court.

constitutionality of laws that call for the application of a qualitative standard such as 'substantial risk' to real-world conduct" – noting, further, that "'the law is full of instances where a man's fate depends on his estimating rightly . . . some matter of degree.'" *Johnson*, ___ U.S. at ___, 135 S. Ct. at 2561 (quoting *Nash v. United States*, 229 U.S. 373, 377, 33 S. Ct. 780, 781 (1913)); *see* 21 AM. JUR. 2D §17 (2017).

We also observe that the vast weight of authority from other jurisdictions supports the conclusion that "substantially similar" is not a vague term *per se* when used in comparing two chemical compounds. The federal circuit courts which have examined this question have generally found that use of the "substantially similar" phraseology in the controlled substance arena does not suffer from unconstitutional vagueness.[23] This view is also held by most appellate courts in other states.[24] As applied specifically to PB-22 and JWH-018, moreover, Appellee has not drawn our attention to any court in any jurisdiction which has held that the substantially-similar descriptor is unconstitutionally vague; as noted above, the Commonwealth has included in its appendix three United States District Court decisions which have held that the federal Analogue Act – which, in relevant part, uses the same substantial-similarity standard as the designer drug provision presently under challenge – is not unconstitutionally vague as applied to these chemicals.

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[23] *See Turcotte*, 405 F.3d at 533; *United States v. Ansaldi*, 372 F.3d 118, 124 (2d Cir. 2004); *Klecker*, 348 F.3d at 72; *United States v. Granberry*, 916 F.2d 1008, 1010 (5th Cir. 1990); *United States v. Orchard*, 332 F.3d 1133, 1138 (8th Cir. 2003); *United States v. Fisher*, 289 F.3d 1329, 1339 (11th Cir. 2002).

[24] *See People v. Silver*, 281 Cal. Rptr. 354, 357 (Cal. Ct. App. 1991); *State v. Alley*, 318 P.3d 962, 973 (Idaho Ct. App. 2014); *abrogated on other grounds by State v. McKean*, 356 P.3d 368 (Idaho 2015); *Hooper v. State*, 106 S.W.3d 270, 277 (Tex. App. 2003); *State v. Srack*, 314 P.3d 890, 897 (Kan. Ct. App. 2013); *State v. Beaudette*, 97 So. 3d 600, 603-604 (La. App. 2012); *State v. Shalash*, 13 N.E.3d 1202, 1209 (Ohio Ct. App. 2014).

Additionally, unlike the controlled-substance analogue offense, the designer drug provision has an express culpability prerequisite whereby a defendant can only be convicted if the government proves he acted knowingly or intentionally. *See* 35 P.S. §780-113(a)(36). Scienter requirements of this nature help alleviate vagueness concerns, both with regard to the adequacy of notice of the proscribed conduct, *see Village of Hoffman Estates v. Flipside, Hoffman Estates, Inc.*, 455 U.S. 489, 499, 102 S. Ct. 1186, 1193 (1982), and as a means of limiting prosecutorial discretion, *see McFadden v. United States*, ___ U.S. ___, ___, 135 S. Ct. 2298, 2307 (2015). The *McFadden* Court, which dealt with the federal Analogue Act, interpreted the scienter mandate as to controlled-substance analogues as meaning that the government must show that the defendant either knew that the substance was a controlled-substance analogue regardless of his knowledge of its identity, or knew that it satisfied the specific statutory prerequisites making it a controlled substance analogue. Those prerequisites include a substantially similar chemical structure to that of a scheduled controlled substance. *See id.* at ___, 135 S. Ct. at 2305 (quoting 21 U.S.C. §802(32)(A)). The Court concluded: "A defendant who possesses a substance with knowledge of those features knows all of the facts that make his conduct illegal[.]" *Id.*; *see also Hoffman Estates*, 455 U.S. at 499 & n.14, 102 S. Ct. at 1193 & n.14 (reciting that the Supreme Court "has recognized that a scienter requirement may mitigate a law's vagueness, especially with respect to the adequacy of notice to the complainant that his conduct is proscribed," and citing cases); *Boyce Motor Lines, Inc. v. United States*, 342 U.S. 337, 342, 72 S. Ct. 329, 331-32 (1952) (indicating that a "knowingly" *mens rea* requirement "does much to destroy any force in the argument" that enforcement of the regulation in question would violate due process on vagueness grounds); *United States v. Novak*, 841 F.3d 721, 728-29 (7th Cir. 2016) (summarizing the *McFadden* scienter analysis,

including the mandate that the government prove the accused knew the chemical structure was substantially similar to that of a scheduled controlled substance); *cf. Tiplick v. State*, 43 N.E.3d 1259, 1265 (Ind. 2015) (relying on an express scienter requirement in rejecting a vagueness challenge to a counterfeit-controlled-substance statute).

There is no issue of statutory construction presently before this Court relating to the scope of the scienter requirement contained in Section 780-113(a)(36). Nevertheless, the Supreme Court's analysis in *McFadden* bears upon the vagueness issue in the following way. Under the canon of constitutional avoidance, if a statute is susceptible of two reasonable constructions, one of which would raise constitutional difficulties and the other of which would not, we adopt the latter construction. *See MCI WorldCom, Inc. v. PUC*, 577 Pa. 294, 311, 844 A.2d 1239, 1249 (2004). Although the designer drug provision does not expressly state that, to be culpable, the defendant must know that the chemical he possesses has a molecular structure substantially similar to that of a scheduled drug, a narrow construction along those lines would be reasonable. *See* 18 Pa.C.S. §302(d) (providing generally that where the law prescribes a particular level of scienter, it applies to all elements of the offense in question); *see also id.* §107(a) (specifying that Title 18's preliminary provisions – including Section 302 – apply to offenses defined in any statute). If a broader interpretation of the statute would render it vague as applied, the court would be obligated to adopt the narrower construction delineated above because, under *McFadden*, such a construction would alleviate vagueness concerns.

Dissenting from the above, Justice Wecht initially suggests that an offense based on a substantial similarity of chemical structures fails to give adequate notice of the prohibited conduct as required by due process, because most citizens are not organic

chemists and the substances they purchase ordinarily are not accompanied by chemistry books or comparative chemical-structure diagrams. *See* Concurring and Dissenting Opinion, *slip op.* at 3-7.

While we certainly understand the concern, we are not convinced that an ordinary citizen's lack of expertise in organic chemistry constitutes a viable basis to conclude that the statute is unconstitutionally vague. If it were, much of the Act would be invalid because many drugs appearing in the schedules are listed by their chemical formulae or technical designations. *See* 35 P.S. §780-104 (listing such scheduled drugs as "N-ethyl-3-piperidyl benzilate," "Delta-6 cis or trans tetrahydrocannabinol and their optical isomers," and "2-(4-Chloro-2,5-dimethoxyphenyl)ethanamine (2C-C)"). A large part of the federal Controlled Substances Act would likewise fall. *See* 21 U.S.C. §812 (enumerating many controlled substances by chemical formulae). *See generally United States v. Niemoeller*, 2003 WL 1563863, at *4 (S.D. Ind. Jan. 24, 2013) (observing that "it takes a chemist to understand many of the compounds on schedule I under the Controlled Substances Act"). More generally, any offense which is predicated on an act or circumstance, the understanding of which involves specialized knowledge, would be at risk of invalidation under the vagueness doctrine.

That doctrine has not developed so strictly as to impose a blanket prohibition along these lines, and we believe it would be misguided to invalidate substantial portions of our controlled-substance legislation on the basis that compounds subject to regulation or criminalization are described by reference to technical formulae unintelligible to the general public. *Accord, e.g.*, *State v. Heinrichs*, 845 N.W.2d 450, 455 (Iowa Ct. App. 2013) ("[W]e decline to find the schedule of controlled substances is constitutionally defective because it uses scientific terms that are obscure to persons of ordinary intelligence lacking in specialized knowledge. 'The use of scientific or technical

terminology or terms of art common in a regulated field does not automatically render a statute unconstitutionally vague.'" (quoting *United States v. Caseer*, 399 F.3d 828, 836-37 (6th Cir. 2005))). As one federal court noted more generally:

> When dealing with legislation on complex or technical matters – whether it concerns intricate corporate tax issues, the details of electronic securities transactions, or international trade in "dual use" technologies – Congress can expect a person who wishes to engage in the activity to acquire the necessary specialized knowledge to conform the person's conduct to law. Similarly, when dealing with the distribution of organic chemical compounds for human consumption and with intended or hoped-for central nervous system effects, Congress could reasonably expect and require persons engaged in that activity to possess or obtain the specialized knowledge needed to conform their conduct to law.

Niemoeller, 2003 WL 1563863, at *4; *accord State v. Shalash*, 13 N.E.3d 1202, 1210 (Ohio Ct. App. 2014). In our view the above proceeds from a reasonable conception of the scope of discretion the legislative branch retains when it seeks to regulate activity that is potentially harmful to the public, and such activity can only be described using technical terminology understandable to individuals with specialized training.

As discussed, moreover, an available interpretation of the designer drug statute incorporates a *mens rea* whereby defendants are only criminally liable if they act knowingly or intentionally with regard to all elements – including, for purposes of the present as-applied challenge, the alleged circumstance that PB-22's chemical structure is substantially similar to that of JWH-018. This limitation helps ensure the statute does not become a trap for unwitting members of the public who have no expertise in organic chemistry. Instead, the statute is quite reasonably aimed at those who traffic in novel compounds which are essentially the same as scheduled controlled substances but contain minor differences designed to evade the statutory schedules. The General Assembly can "reasonably expect and require persons engaged in that activity to

possess or obtain the specialized knowledge needed to conform their conduct to law." *Niemoeller*, 2003 WL 1563863, at *4.

In a separate line of attack, Justice Wecht acknowledges the Supreme Court's recent guidance in *McFadden*, as well as *Colautti v. Franklin*, 439 U.S. 379, 99 S. Ct. 675 (1979), where a statute's *lack* of a scienter requirement contributed to the Supreme Court's finding that it *was* vague. *See id.* at 401, 99 S. Ct. at 688. Further, he recognizes that the Supreme Court has issued other decisions containing language similar to *McFadden*'s, indicating that scienter requirements mitigate, alleviate, or ameliorate vagueness concerns. *See* Concurring and Dissenting Opinion, *slip op.* at 11-12 (citing cases). He also highlights a decision of this Court stating that "vagueness challenges fail when a statute has a specific intent requirement because a defendant cannot complain he did not understand the crime . . .." *Id.* at 12 n.5 (quoting *Commonwealth v. Hendrickson*, 555 Pa. 277, 284, 724 A.2d 315, 319 (1999)). Nevertheless, Justice Wecht offers that the concept that a scienter prerequisite can help alleviate vagueness difficulties has been criticized by commentators, and that it is in tension with the maxim that ignorance of the law is not an excuse. *See id.* at 12.

Because the void-for-vagueness doctrine is grounded on federal due process norms, we believe the Supreme Court's pronouncements are particularly germane to the resolution of the matter before us, notwithstanding the thoughtful contributions of learned commentators. As far back as 1979, the Supreme Court stated it "ha[d] long recognized that the constitutionality of a vague statutory standard is closely related to whether that standard incorporates a requirement of *mens rea*." *Colautti*, 439 U.S. at 395, 99 S. Ct. at 685. *McFadden*, in particular, is highly relevant since it dealt with a federal statute prohibiting knowing or intentional conduct – including possession with intent to distribute – relative to a controlled-substance analogue which, under the

federal system, is defined using the same substantially-similar-chemical-structure phraseology as Pennsylvania's designer drug statute. *See* 21 U.S.C. §§802(32)(A) (defining "controlled substance analogue" in terms of a chemical structure "which is substantially similar to the chemical structure of a controlled substance in schedule I or schedule II"), 841(a) (reflecting an express "knowingly or intentionally" *mens rea*); *accord McFadden*, ___ U.S. at ___ n.2, 135 S. Ct. at 2305 n.2 (reflecting that the government had to prove, *inter alia*, that the substance in question was "substantially similar in chemical structure to a controlled substance").[25]

Further, if the law being enforced only prohibits knowing or intentional conduct, any ignorance by a defendant which could defeat culpability would not be offered as an excuse. *See generally* 18 Pa.C.S. §302(h). It would be advanced as a basis to conclude that the Commonwealth failed to prove an element of the offense. Thus, any perceived tension with the legal maxim involving ignorance of the law is illusory. *See, e.g.*, *United States v. Int'l Minerals & Chem. Corp.*, 402 U.S. 558, 561-62, 91 S. Ct. 1697, 1700 (1971); *Staples v. United States*, 511 U.S. 600, 622 n.3, 114 S. Ct. 1793, 1805 n.3 (1994) (Ginsburg, J., concurring) ("The *mens rea* presumption requires knowledge *only of the facts* that make the defendant's conduct illegal, lest it conflict with the related presumption . . . that . . . ignorance of the law . . . is no defense . . .." (emphasis added)); *United States v. Elias*, 1999 WL 1204529, at *1 (D. Idaho Apr. 20, 1999) (explaining that *Staples* and two other Supreme Court decisions "have not altered the traditional rule that ignorance of the law is no excuse, but have only stated that knowledge is required where the statute specifically imposes that type of requirement"); *cf. Winget v. Rockwood*, 69 F.2d 326, 332 (8th Cir. 1934) (in a civil setting,

[25] Although 21 U.S.C. §841(a) facially applies to controlled substances, under the federal Analogue Act the term subsumes controlled substance analogues, *see* 21 U.S.C. §813, the very category of chemicals at issue in *McFadden*.

distinguishing ignorance of the law from ignorance of certain facts); *Ciesielski v. Prudential Ins. Co. of Am.*, 416 Pa. 146, 148, 205 A.2d 42, 43 (1964) (same).[26]

Finally, we differ with any suggestion that we are treating the analogue provision and the designer drug statute in a logically inconsistent fashion. *See* Concurring and Dissenting Opinion, *slip op.* at 14-15 (Wecht, J.). Although a chemical analogue of a controlled substance would most naturally be understood as a molecule with a substantially similar chemical structure, as noted above the General Assembly has precluded that meaning by specifying that analogues and designer drugs are mutually exclusive categories – and has done so without providing any substitute standard for understanding what it intended to signify by the word "analogue." *See supra* note 17.

In summary, then, the common pleas court did not account for the difference between the concepts of analogue and substantial similarity, the latter of which is more readily apprehensible to the lay citizen in the context of comparing chemical structures; nor did it recognize that, unlike the controlled-substance provision, the designer drug provision includes a narrowing scienter specification. Moreover, like the federal appellate court in *Klecker*, we find in this case that there are "considerable similarities" as between the two molecules based on their two-dimensional diagrams. *Klecker*, 348 F.3d at 72; *see Johnson*, 2014 WL 7330936, at *5 (concluding that "the readily apparent similarities between the chemical structures of 5F-PB-22 [a variant of PB-22] and the scheduled substances JWH-018 and AM-2201 [as reflected in two-dimensional diagrams], are enough to put a reasonable person on notice that 5F-PB-22 and JWH-018 are substantially similar").

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[26] We note parenthetically that ignorance of the law can constitute a basis to escape liability if the applicable legislation specifies that, to be guilty, the defendant must have intended to violate the law. *See, e.g.*, *Ratzlaf v. United States*, 510 U.S. 135, 149, 114 S. Ct. 655, 663 (1994).

In light of the foregoing, we conclude that predicating criminal liability on a jury determination – perhaps assisted by expert evidence – as to whether JWH-018 and PB-22 have substantially similar chemical structures does not give rise to a circumstance in which the average citizen must necessarily guess at the types of behavior that are proscribed by Section 780-113(a)(36). For the same reasons – particularly those relating to the scienter provision – the discretion of government agents is adequately circumscribed to guard against arbitrary or discriminatory prosecutions. That being the case, this provision withstands the present void-for-vagueness challenge.[27]

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[27] Appellee claims that the Commonwealth waived the issue of whether PB-22 has substantially similar effects to those of JWH-018 by not including a claim along these lines in its Rule 1925(b) statement of matters complained of on appeal. *See* Brief for Appellee at 8-9. As previously noted, that question is not presently in dispute.

To the extent Appellee's brief may be understood as asserting waiver more generally in regard to the constitutionality of the designer drug charge, it should be noted that the order appealed from, issued on February 10, 2015, provided no explanation for its dismissal of all charges. In addition, by order dated March 13, 2015, the court directed the Commonwealth to file its Rule 1925(b) statement within 21 days, or no later than April 3, 2015. Notably, the court did not issue its opinion until May 28, 2015, long after the deadline for the Commonwealth's filing had passed, and even longer after the court had stated that it would issue an opinion. *See Commonwealth v. Herman*, No. CP-67-CR-2400-2014, Order (C.P. York Feb. 3, 2015) (indicating that the court would issue an opinion within 30 days, or by March 5, 2015).

Under these unusual circumstances, and particularly where the *habeas* petition in question implicates multiple issues, the normal waiver rules concerning the specificity of the contents of an appellant's concise statement are relaxed. *See Ryan v. Johnson*, 522 Pa. 555, 560, 564 A.2d 1237, 1239 (1989); *Hess v. Fox Rothschild, LLP*, 925 A.2d 798, 804 (Pa. Super. 2007). *See generally Commonwealth v. Hess*, 570 Pa. 610, 619 n.9, 810 A.2d 1249, 1255 n.9 (2002) (citing *Ryan* for the position that the rule requiring an appellant to file a 1925(b) statement upon the court's directive "may not be employed as a trap to defeat appellate review"). Here, the Commonwealth filed a timely statement and alleged, generally, that the county court had erred in granting Appellee's *habeas* petition. This satisfied the dictates of *Ryan*.

Accordingly, we reverse the holding of the court of common pleas as respects the designer-drug charge.

III. Conclusion

For reasons given above, we affirm in part, reverse in part, and remand for further proceedings consistent with this opinion.

Justices Baer, Dougherty and Mundy join the opinion.

Justice Donohue files a concurring and dissenting opinion in which Justices Todd and Wecht join.

Justice Wecht files a concurring and dissenting opinion in which Justices Todd and Donohue join.