Question for Dr. Daniele Piomelli, Professor, Departments of Anatomy and Neurobiology, Pharmacology and Biological Chemistry, and Louise Turner Arnold Chair in the Neurosciences, University of California, Irvine

Is it clear that marijuana has some medical value?

Regardless of the greater research needed into the medical benefits and risks of marijuana, the data we do have seems to illustrate that marijuana is a promising treatment for many patients – as many patients in Connecticut, which has legalized the use of medical marijuana, have found.

This is not to downplay the fact that this drug, like many others that are widely prescribed, poses several risks. To better serve our physicians in helping treat their patients as responsibly and helpfully as possible, it seems that there is a need for more research into medical use of marijuana.

Because there is strong evidence that marijuana has some medical benefits, despite its risks, is it inaccurate for our laws to regard marijuana as having no legitimate medical use?

Dr. Piomelli's response:

Two scientific publications have recently provided a thorough and critical examination the medical benefits of marijuana and cannabinoids:

- Writing in the *Journal of the American Medical Association* (*JAMA,* 313:2474-2483, 2015), Dr. Kevin Hill (Harvard Medical School) reviewed data from more than 40 clinical trials of marijuana and cannabinoids. From this analysis, Dr. Hill concluded, "the strongest evidence exists for the use of marijuana and cannabinoids as pharmacotherapies for chronic pain, neuropathic pain *[a form of chronic pain that affects the nerves and the brain]* and spasticity associated with multiple sclerosis." For these indications, Dr. Hill stated that the use of marijuana "is supported by high-quality evidence", which he defined as evidence gathered from "multiple randomized clinical

trials with positive results." Of note, Dr. Hill's article also pointed out that "for some of the medical conditions approved for use [of marijuana] in some States (eg, glaucoma), there are only preliminary data supporting the use of medical marijuana as pharmacotherapy."

- Also writing in *JAMA (*313:2456-2473, 2015*)*, Penny Whiting (University Hospitals, Bristol, United Kingdom) and collaborators reviewed 79 randomized clinical trials of cannabinoids for the following indications: nausea and vomiting due to chemotherapy, appetite stimulation in HIV/AIDS, chronic pain, spasticity due to multiple sclerosis or paraplegia, depression, anxiety, sleep disorder, psychosis, glaucoma, and Tourette's syndrome. The authors concluded, in substantial agreement with Hill (2015), that "there was moderate-quality evidence to support the use of cannabinoids for the treatment of chronic pain and spasticity" and "low-quality evidence suggesting that cannabinoids were associated with improvements in nausea and vomiting due to chemotherapy, weight gain in HIV infection, sleep disorder, and Tourette syndrome." It is worth noting that Whiting and collaborators found that data quality was generally higher for chronic pain and spasticity than for nausea and vomiting due to chemotherapy, a condition for which two cannabinoids (dronabinol and nabilone) are currently approved by the United States Food and Drug Administration.

In conclusion, the data reviewed above indicate that marijuana may have medical benefit in the treatment of chronic pain, neuropathic pain and spasticity due to multiple sclerosis, as well as potential benefit in nausea and vomiting due to chemotherapy, weight gain in HIV infection, sleep disorder, and Tourette syndrome. By contrast, clinical evidence is still lacking regarding other pathological conditions for which marijuana is currently approved for use in 23 States and the District of Columbia. These pathological conditions include: depression, anxiety, Parkinson's disease, Alzheimer's disease, Amyotrophic Lateral Sclerosis, and Crohn's disease. Therefore, the current classification of marijuana as a Schedule 1 drug (that is, a drug with no medical use and high risk of abuse) is inconsistent with the available clinical evidence.

Question for Dr. Daniele Piomelli re: Treating Young Patients

Can marijuana help treat the conditions of young patients?

In an article in the *New Haven Register* a few months ago, I learned the story of Sean Hearn, 11, of Stratford, Connecticut. Sean suffers from 50-plus seizures in a day because of a severe, rare form of epilepsy.[1] He uses a wheelchair, and can't walk, talk or survive without a feeding tube and pureed food. Sean takes five medications, all of which have severe side effects. "The problem with seizure meds is every bit you give him, he loses a little of himself," Sean's mother, Kim, said. She, her husband, and Sean's doctor will consider use of CBD oil when it becomes legal this October for minor patients in Connecticut, following a vote by our state legislature.

Is it likely that medical marijuana can help children like Sean and other Connecticut families undergoing similar situations?

Dr. Piomelli's response:

There is promising clinical evidence that one of the chemical constituents of marijuana, cannabidiol (CBD), may have therapeutic value in some forms of childhood epilepsy. Additional studies are needed, however, to confirm potential benefits and identify risks associated with the clinical use of CBD in children.

[1] Pam McLoughlin, *Connecticut Advocates Cheer Passage of Medical Marijuana Law for Minors*, THE NEW HAVEN REGISTER (May 30, 2016), http://goo.gl/72MUZZ.

Question for the second panel (Gitlow, Barber, Piomelli)

Shouldn't we increase research on medical benefits of marijuana?

It seems safe to say that the three of you bring different perspectives, but that you each agree that further research into the potential medical benefits and risks of marijuana is merited.

What are the most important considerations that we as policymakers should take into account when confronting this issue?

Dr. Piomelli's response:

We do need further research on the potential medicinal benefits of marijuana. However, two formidable obstacles stand in the way of research progress.

The first is the current status of marijuana as a DEA Schedule 1 drug (that is, a drug with no medical use and high risk of abuse). As I argued in response to a previous question, this classification is inconsistent with the available clinical evidence. DEA's statement that marijuana's Schedule-1 status does not hinder research is disingenuous – as a researcher active in the field I can assure you that it does, and greatly so.

Another major obstacle to medical research on marijuana is lack of funding. The National Institute on Drug Abuse (NIDA) is doing their best with the limited funds available to them. What is needed, however, is to allocate fresh earmarked funds to an inter-institute NIH initiative involving NIDA, the National Institute of Mental Health, the National Institute on Alcohol and Alcoholism, the National Cancer Institute, and possibly other NIH Institutes, to fund high-quality peer-reviewed research projects aimed at fully understanding the medicinal benefits and risks of marijuana, and at leveraging our growing knowledge of the endogenous cannabinoid system to develop safer and more effective medicines for pain, epilepsy, autism and other human diseases.

Question for D. Linden Barber, Director, DEA Compliance and Litigation Practice, Quarles & Brady, LLP

What changes or reforms should be made to DEA security practices going forward?

Mr. Brady, in your testimony you indicate that although the regulatory requirements DEA puts in place can be significant, the agency has been open to considering exceptions and flexibility where merited.

Do you believe that any of the individual exceptions you have seen granted to researchers should be codified in DEA policy in order to facilitate access to other researchers?

Are there other changes or reforms you believe DEA could institute to better enable research to occur?