David Schubert, Salk Institute neurobiologist: ‘no credible evidence GMOs are safe’

David R. Schubert, who died in August 2020, was professor and the head of the Cellular Neurobiology Laboratory at the Salk Institute for Biological Studies in La Jolla, CA. He was an outspoken critic of genetically modified crops: “The problem is that experimental biotechnology is applied to food with no mandatory safety testing,” he said.

Schubert’s lab studied neurodegenerative disorders, such as Parkinson’s and Alzheimer’s disease. He received a PhD in cell biology from the University of California, San Diego and has twice (1993 and 1986) won the Jacob Javits Award, which is given by the US Congress for excellence in neuroscience research.

Schubert argued that “there is no credible evidence that GMO foods are safe to eat” and that allergies have gone up considerably in the decade since genetically engineered foods were introduced.[2]

Because of his scientific credentials, the mainstream media on numerous occasions gave Schubert prominent platforms to share his views on genetically modified organisms. On August 2016, the San-Diego Union Tribune published an opinion piece written by Schubert about the bill which requires all foods containing GMOs to be labeled. In the article, he pointed out that the “World Health Organization (through a research arm) has declared that the herbicide glyphosate is a probable carcinogen.” But he neglected to mention that the organization followed up the proclamation with a statement, in which it said glyphosate is “unlikely to pose a carcinogenic risk to humans” exposed to it through food. He also made unsupported claims about cases in which a person has been harmed by eating genetically modified foods. Further, he cautioned parents not to place too much trust in organics:

If you do not want your kids to be exposed to the real hazards associated with GM products and the poisonous chemicals required to produce them, the only alternative will be to buy organic. But this may not be sufficient. There is wording in this bill that has the potential to blur the distinction between GM and organic…

Keep in mind that from now on, the government agency most beholden to the chemical agriculture industries, not the FDA, has total control over the major public health issue of letting us know what we are eating!

In February 2014, CNN published an article in which Schubert incorrectly claimed there is no scientific consensus on GMOs. He also argued that “future GM crops will likely trigger a greater use of more toxic herbicides such as 2,4-D, a component of the Agent Orange defoliant deployed in Vietnam.” He also wrote that because other countries have labeled or banned GMOs that it means they are unsafe: “Most of the world has studied this issue and concluded that GMOs are not worth the risk.” He said this despite the fact that GMOs have been declared safe by the vast majority of scientists and regulators who have studied them.
You can watch a video in which he outlined his objections to GM foods here:

Education

- B.A., Chemistry, Indiana University, Bloomington
- Ph.D., Cell Biology, UCSD (immunology)
- Post Doc, Cell Biology, Nobel Laureate Francois Jacob, Pasteur Institute, Paris
- Graduate student with Mel Cohn, Salk Institute

Awards:

- Jacob Javits Award, 1986
- Zenith Award, Alzheimer’s Association
- Jacob Javits Award, 1993

Salk Institute

At the Salk Institute, Schubert searched for drugs that prevent or reverse neurodegenerative disorders such as Parkinson’s disease and Alzheimer’s disease. Schubert said he has created an approach to quickly screen many chemical compounds for their ability to prevent nerve death, allowing him to study neurodegeneration in a way different than those of other labs and companies. Using this approach, Schubert found that fisetin — found in strawberries and other fruits and vegetables — and the spice turmeric have neuroprotective properties.

His research was funded in part by the Michael J. Fox Foundation for Parkinson’s Research (Fox’s sister is married to anti-GMO activist author Michael Pollan and Fox has appeared in anti-GMO campaign ads for the Just Label It initiative).[3] He also received funding from the Alzheimer’s Foundation[4] and has done research for the U.S. Army Medical Research Lab on neurotoxins.

Advocacy

Schubert was a frequent critic of GMOs in agriculture. His comments have been included in numerous advocacy campaigns, letters and press releases by anti-GMO forces. He served as an advisor and has appeared in one of Jeffrey M. Smith videos in his Genetic Roulette documentary series.[5] Schubert has joined in statements by the alternative health industry promoting the American Academy of Environmental Medicine (which promotes the “prescribing” of organic foods to treat various illness ranging from autism to diabetes), warning in their materials that “children are the most likely to be adversely effected by toxins and other dietary problems” related to GM foods. He says that in the absence of adequate studies, children become “the experimental animals.”[6]
Schubert has published negative claims in various journals warning of the risks of plant biotechnology. He has specifically questioned the safety of nutritionally enhanced (e.g., Golden Rice) GMO plants, claiming they enter the food supply without mandatory testing.[7]

**Schubert History of anti-GMO Advocacy**

1998: Schubert contributed to a Physicians and Scientists for Responsible Application of Science and Technology report entitled Inadequate Safety Assessment of GE Foods. The report asserts: “It has been scientifically established that genetic engineering can cause the appearance of unexpected harmful substances…” and that the “principle of substantial equivalence for GE food approval is unscientific…”[8]

2002: Schubert claimed, via the Organic Consumers Association, that gene-splicing foods is imprecise and unpredictable. “In a recent paper circulating on the internet, Professor David Schubert of the Salk Institute in San Diego, California, points out that the current crude and imprecise nature of gene-splicing foreign DNA into common foods is inherently troubling and potentially dangerous because (1) introducing the same gene into two different cell types or body parts in an organism can cause very different proteins to be produced, with radically different activity; (2) introducing new genes into cells significantly disrupts inter-cellular activity and processes; and (3) introduction of foreign genes can produce new biomolecules which can be toxic or carcinogenic. Recent advances in gene chip technology are enabling scientists such as Schubert to quantitatively measure cellular disruption caused by gene-splicing. In one experiment, the introduction of a foreign gene caused a disruption of a full 5% of all genes in single-cell bacteria. In layperson’s terms this means that 15,000 of the 300,000 genes in a plant could be disrupted by a single routine act of gene-splicing. This means that plant genes could be turned off, amplified, or turned up more, either producing more or fewer proteins (some of which are beneficial to humans, some of which are toxic) and chemical activity.”[9]

2002: Schubert published in Nature Biotechnology “A different perspective on GM Food,” again questioning the safety and rationale for regulatory approvals and use of GMOs in agriculture.[10]

2003: Schubert claims there is no way to predict these (GMO risk) outcomes in advance. In an article published in Tom Paine (online) he points to one particularly tragic incident to illustrate what can go wrong with genetic engineering. In the late 1980s, Showa Denko, a Japanese chemical company, began producing the amino acid L-tryptophan with genetically engineered bacteria. Unfortunately, the modified bacteria also produced a novel amino acid that turned out to be highly toxic, killing 37 people, permanently disabling 1,500 and making more than 5,000 sick.[11]
2006: The second disk in The GMO Trilogy, Hidden Dangers in Kids’ Meals, by Jeffrey Smith was released. According to activist Brian Tokar it delves “into the health consequences of GE foods, featuring interviews with some of the world’s most prominent independent scientists who have arisen as vocal critics of this technology…. as well as David Schubert of the Salk Institute and many others. Jeffrey Smith, the best-selling author of Seeds of Deception and producer of the GMO Trilogy, intersperses the scientists’ comments with a running overview of some of the most disturbing scientific findings about GE food crops and milk from cows injected with the hormone rBGH.”[13]

2006: Publishes in Nature Biotech, ‘Cisgenic’ as a product designation, by David Schubert and David Williams.[14]

2009: Schubert signed on with 22 anti-GMO scientists to criticize Tufts University research on Golden rice, calling it “a dangerous experiment” on adults and children. They said it breaches “the Nuremberg Code” and likened the researchers to Nazi scientists.[15] [16]

2009: Schubert wrote India Environment Minister Jairam Ramesh in an effort to block the introduction of Bt Brinjal, claiming there was no need for the product. He wrote that it “poses a serious health risk” and cited high environmental risks, high costs to farmers and the creation of political and social dependence. He said Bt Cotton has caused “serious health problems and deaths for farm animals.”[17]

2012: Schubert testified and lobbied in support of California Prop 37, claiming there is no mandated safety testing and no way to test the safety of GMO crops. He said there are no long-term human studies and the animal studies are not positive, citing the widely-criticized work of Gilles-Éric Séralini, whose studies show links between GMOs and cancer in rats. Séralini’s most widely known study was retracted in 2013 following criticism of his methods by other scientists. It was later republished in a pay-for-play journal. Schubert said he has reviewed the Seralini paper and that criticisms of the paper are “simply not valid.”[18] Schubert appeared at joint events with Jeffrey M. Smith and other organic opponents of GMOs to lobby for the passage of Prop 37.[19]

2013: Schubert wrote in August to the Bangladesh Prime Minister in protest of the regulatory application for Bt Brinjal, again claiming a lack of adequate safety studies for humans.[20]

2013: In the Hawaii GMO debates, Schubert was frequently cited in news reports raising concerns about potential health problems linked to GMO plants. According to a story in Honolulu Magazine: “David R. Schubert, an expert in molecular genetics and cell biology who heads the Salk Institute’s Cellular Neurobiology Laboratory in San Diego, states in his declaration that ‘consumption or inhalation of the plant-produced pharmaceutical could trigger a number of dangerous immune system reactions. These include oral tolerance, allergic reactions and autoimmune disorders.’”[21]

2016: Schubert was part of an initiative by the group AGRA Watch — a campaign of the Community Alliance for Global Justice — to stop human testing of vitamin A enhanced GM bananas at Iowa State University. The group delivered a petition (with 57,000 online signers) to the Bill and Melinda Gates Foundation (the study’s funders) which used quotes from Schubert, claiming beta-carotene —, a vitamin A
precursor and the stuff that makes carrots orange — causes birth defects.

**Other Advocacy**

Schubert also served on the City of San Diego Independent Water Advisory Panel. Schubert was a member of the San Diego County Science Advisory Board. He was also a frequent contributor to the San Diego Union-Tribune editorial page on the subject of science policy. [22]

**Criticisms**

- In a July 2015 article in Slate, William Saletan accused Schubert of manipulating facts as a way to discredit golden rice:

  Schubert systematically distorted the evidence. To suggest that Golden Rice might be toxic, he cited a study that had been reported in the *New England Journal of Medicine* in 1994. Schubert said the study found that “smokers who supplemented their diet with beta-carotene had an increased risk of lung cancer.” He neglected to mention that the daily beta carotene dose administered in the study was the equivalent of roughly 10 to 20 bowls of Golden Rice. He also failed to quote the rest of the paper, which emphasized that in general, beta carotene was actually associated with a lower risk of lung cancer.

- Nina Fedoroff, former President of the American Association for the Advancement of Science, said in response to Schubert’s allegation of scientific fraud related to GMOs:

  I read your recent opinion piece on science fraud. I respectfully suggest that you dig a bit deeper for your facts before you publish such completely unfounded allegations about the biotechnology industry and GM foods. It is unconscionable to use your position as an academic to propagate such junk. Should you be interested, I’m attaching the material that I developed on the Puztai affair when I was writing a book on GM foods. If you have the patience to read through it, I think that you will understand that there are no heroes or villains in this story — certainly the biotech industry had little to do with the debacle and Puztai is not blameless.

**Bibliography & Resources**

**References**

- 3  https://www.michaeljfox.org/foundation/researchers.php?id=1349