

# ***Good Vibrations Give Plants Excitations***

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*Page 10*

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Eccentric gardeners who sing to their plants may not be altogether mad, says Joel Sternheimer, a French physicist and musician. Sternheimer writes melodies that allegedly help plants grow, and has recently applied for an international patent covering his method of music making.

The tunes are not random melodies: he chooses each note to correspond to an amino acid in a protein, and the full tune corresponds to an entire protein. Sternheimer claims that when plants 'hear' the appropriate tune, they produce more of that protein. He also writes tunes that inhibit the synthesis of proteins.

He claims to be able, using simple physics, to translate into audible vibrations of music the quantum vibrations that occur at the molecular level as a protein is being assembled from its constituent amino acids. *"Each musical note is a multiple of original frequencies that occur when amino acids join the protein chain"*, explains Sternheimer.

Playing the tune stimulates synthesis of its protein. *"The length of a note corresponds to the real time it takes for each amino acid to come after the next"*, says Sternheimer, who studied quantum physics and mathematics at Princeton University in New Jersey.

His patent includes melodies for cytochrome oxidase and cytochrome C, two proteins involved in respiration, troponin C, which regulates calcium uptake in muscles, and the tune for inhibiting chalcone synthase, an enzyme involved in making plant pigments.

Sternheimer claims that in experiments, tomatoes exposed to his tunes grew two-and-a-half times as big as controls. Some were sweeter as well, he says. The tunes played included those for three tomato growth promoters, cytochrome C, and for thaumatin, a flavouring compound. *"Six molecules were being played to the tomatoes for a total of three minutes a day"*, he says.

He also claims to have stopped an infection of the tomatoes with a mosaic virus by playing tunes that inhibited enzymes vital to the virus.

The tunes are very short, he says, and need only be played once. The one for cytochrome C, for example, lasts just 29 seconds. *"On average, you get four amino acids played per second"*, he says.

Sternheimer warns scoffers to be careful tinkering with the tunes because they can affect people as well. *"Don't ask a musician to play them"*, he says. *"You must be very careful."* Sternheimer says that one of his musicians had difficulty breathing after playing the tune for cytochrome C too often.

Sternheimer says that support for his methods is spreading 'by word of mouth'. One admirer, he says, is a leading Swiss industrialist who paid for the patent to be filed. The patent covers applications in agriculture, health care and the textiles industry.