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Wave/particle duality in biomedical research

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Because medical conditions occur in the physical body, we automatically assume that their causality is some form of matter. The fact that at a subatomic level, no difference between matter and energy is distinguishable has not changed our focus on matter as sole causality. Thus, we design our experiments to see particles. To understand DNA we separate the double helix and sequence the individual base pairs. This methodology has been highly successful in helping us to genotype diseases characterized by Mendelian inheritance. A couple of years ago, scientists succeeded in removing the DNA from a certain type of bacteria and inserting synthesized DNA to change the bacterial phenotype. However this experiment only works in a living cell. The cell, with the DNA removed was still living. This begs the question of how we define life. When we set up the experiment to see particles, we do not see the waveform. In order to see the waveform, the DNA helix must be left intact, because the entire strand is an electrical conductor. Wave functions extend perpendicular to the base planes forming what is known as a p orbital. The meaning and importance of DNA electrical conduction has not been investigated. As gene and molecular technology improve, the accuracy with which we can measure molecular events has increased exponentially. The thesis of this talk is that no matter how accurately we measure, if we are excluding relevant data points, our interpretations can end up being biased and misleading.

Biography

Sarah S Knox completed her PhD at Stockholm University in Sweden and began her career at the Karolinska Institute. After returning to the US, she worked at the National Institutes of Health for 17 years. She is currently a full Professor at West Virginia University. Her publications, honors and awards can be found on Research Gate.

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