

Quantum biology: an Introduction

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Abstract

Quantum mechanics and molecular biology were the two revolutionary scientific disciplines that grew out of the twentieth century: quantum mechanics and molecular biology. Quantum biology can be said to have been initiated by a physicist, Erwin Schrödinger, in his lecture, essay and book entitled “What in Life” (published in 1944) in which he proposed that that heredity was based on non-trivial aspects of quantum mechanics. The book was very influential to molecular biology pioneers, such as James Watson and Francis Crick, who went on to discover the double-helical structure of DNA. Thereafter the field of quantum biology largely languished. However, the twenty-first century has seen a revival of quantum biology with the arrival of new experimental evidence of quantum mechanical effects in a range of biological phenomena such as photosynthesis and enzyme action. In this talk I will provide an introduction to quantum biology, returning to Schrödinger’s original insight that quantum phenomena may be found in biological processes that involve very numbers of molecules including photosynthesis, enzyme action, avian navigation and mutation.
