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For the best part of the twentieth century, biology remained a distant cousin of physics. A diluted first year course in physics is often deemed adequate for the needs of a professional biologist while no biology course is taught to physics majors. This situation is changing rapidly nowadays as biology turns from a descriptive to a quantitative science. Physical techniques such as x-ray crystallography, nuclear magnetic resonance, electron and atomic force microscopy have played a major role in this ongoing revolution in molecular biology. Today, molecular structures of over 30,000 proteins are known, which are readily accessible from the protein data bank. The next step is to understand the function of these complex biomolecular systems in terms of clearly formulated theories that explains all their observed properties. After all, as Poincare once observed: ‘The goal of science is order. Science is constructed from facts just as a house is constructed from stones, but an accumulation of facts is no more a science than a pile of stones is a house.’

Once the structure-function relationships in proteins are well understood, this knowledge can be put into practical use, for example, in designing new drugs. Achieving such aims will require careful modeling utilizing high-performance computers, and a true grounding in the core subjects in physics, such as electrodynamics, quantum and statistical physics. As a response to this need, an interdisciplinary degree in physics and biology is gradually appearing here and overseas. Due to natural lag in such responses, raising of this new generation of biophysicists will take time. In the meantime, research in biophysics will be carried out by physicists interested in biological problems or biologists willing to learn the necessary physics. At the moment, there is little interaction between the physics and biology communities in Australia. In order to take full advantage of the recent advances in biology and the advent of a new generation of supercomputers, and make significant contributions to the field, it is important to establish bridges between the two communities. As well as providing training for graduate students, this school is designed to foster such links.

SERDAR KUYACAK

* Dedicated to the memory Peter Kollman who passed away shortly after delivering lectures at the Summer School.