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Obituary

Abraham Worcel (1938–1989)

Abe Worcel died on December 27, 1989. We will miss him greatly. He was a good friend.

If there is a single word to describe Abe, it is "passion"—passion for his wife and daughter, for fine wine, for good food, and for truth and beauty. But most noticeable of all was his passion for science. He was a teacher who taught by example; he taught us not to be ashamed of our love of science—his own was so transparent, so infectious, so exciting.

Abe was born in Argentina, where he attended medical school. He then went to the University of Wisconsin to do research in enzymology (Worcel et al., 1965; Worcel, 1966). It often seemed, though, that his heart remained in Paris where, as a postdoctoral fellow at the Institut Pasteur, he studied the initiation of DNA replication in E. coli (Worcel, 1970; Fritsch and Worcel, 1971; Schwartz and Worcel, 1971).

When he moved to Princeton University as an assistant professor in 1971, Abe began a series of brilliant studies elucidating the structure of the E. coli chromosome. Step by step, methodically, imaginatively, he described the supercoiled structure of the chromosome: that it is arranged in domains or loops, about 50 of them (Worcel and Burgi, 1972), that it is membrane-bound (Worcel and Burgi, 1974), and finally, there was the picture (Delius and Worcel, 1974)—the famous electron micrograph of the E. coli chromosome—an image that embraced every prediction from the elegant physical studies (Drlica and Worcel, 1975). In subsequent experiments, Abe went on to show that the same long-range principles of DNA folding also apply to eukaryotic chromosomes (Benyajati and Worcel, 1976; Worcel and Benyajati, 1977).

His interests then turned to nucleosomes, where his work was instrumental in outlining certain general features of nucleosome and chromatin structure (Worcel, 1978; Worcel et al., 1981) and demonstrating that nucleosome assembly occurs near the replication fork (Worcel et al., 1978). Abe moved from Princeton to the University of Rochester in 1981. There, he presented the first clear data showing that nucleosomes can be positioned on specific DNA sequences in vivo (Samal et al., 1981). He also developed a cell-free system for nucleosome assembly from frog oocytes (Ruberti and Worcel, 1986; Shimamura et al., 1989a) that he used to study both histone assembly (Rodriguez-Campos et al., 1989) and the effect of chromatin structure on gene expression (Shimamura et al., 1989b; Tremethick et al., 1990).

Abe was an unusually imaginative and creative scientist with enormous energy and enthusiasm. His intensity and ability to focus all his attention on a single scientific problem for months on end not only brought distinction to his own work, but elevated the quality of science and increased its enjoyment for many others who interacted with him. As François Jacob, Abe's colleague and advisor in Paris, pointed out in his autobiography: "There is a style in science. As in art, in literature, in poetry. Not just a way of looking at the world, but also of questioning it" (Jacob, 1988). Everyone who knew Abe was aware of his style. He was consumed with trying to understand and was elated whenever he thought he knew an answer to an important biological puzzle. How disappointed he must have been when, as often happens, Nature's secrets fell beyond his grasp.

In concluding, we can do no beter than to quote François Jacob again, "With the disappearance of Abe Worcel, science has lost a lover. We have lost a friend."

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