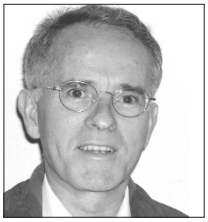

José Campos-Ortega 1940–2004

Volker Hartenstein & Michael Bate

With the death of José Campos-Ortega, we have lost a wonderful colleague and a great scientist. Recognized for his elegant embryological and genetic analysis of early neural development in the fruit fly *Drosophila melanogaster*, he shaped the field of neurogenetics like few of his contemporaries. Through detailed exploration of the way in which the number and pattern of neural progenitors depend on the tightly regulated expression of proneural and neurogenic genes, he tied cells and molecules—tangible biological entities—to abstract concepts of fate determination, equivalence groups and lateral inhibition. We now recognize the proneural genes, encoding transcriptional regulators of the bHLH family, and the neurogenic genes, representing the Notch signaling pathway, as regulators of cell fate in virtually every animal tissue. José's ability to grasp and rapidly disseminate these ideas in the developmental biology community stemmed from his capacity to combine the modern tools of molecular genetics with the classical approach of experimental embryology. He consciously followed in the footsteps of pioneers like Donald Poulson, who, more than a generation earlier, bridged the gap between genetics and the study of development. In this spirit, José shared his knowledge and enthusiasm in books that have guided a generation of fruit fly embryologists.

José's unique contribution to developmental biology had its origins in his early experiences as a young scientist. Like Ramón y Cajal before him, he sought to understand the structure of the nervous system as the basis for its function. As a result, he spent his formative years not with gels and centrifuges, but with tissue sections and microscopes, studying the pattern of brainstem nuclei in reptiles and tracing nerve connections in the brains of primates. He studied medicine at the University of Valencia and received his doctorate in neuroanatomy, before moving to Göttingen to work with Paul Glees on the connectivity of the primate visual system. From there, he made a decisive shift, moving to the Max Planck Institute for Biological Cybernetics in Tübingen in 1970 to explore the visual system of the house fly as a model for studying neural structure and function. In Tübingen, he first encountered the possibility of working at the level of single cells rather than the large cell populations typical of vertebrate neural systems.

In 1973, José moved to a professorship in Freiburg. There, his interests turned from the visual system to the central nervous system of the fruit fly embryo. By this time, he was deeply engaged in studying neurogenesis, and working with *D. melanogaster* brought with it the possibility of applying genetics and molecular biology to examining this process. On one memorable occasion, brimming with the enthusiasm of a true discoverer, he showed a microscope slide with fuchsin-labeled embryos, the nervous system appearing as a dense cloud of red specks embedded in larger clouds of similar dots that represented all the other tissues of the embryo. Only a morphologist, used to looking at X-ray films and diagnosing the minuscule area of lower density as a stomach ulcer, could have had the ability and courage to see what José saw: that here was a method for tracing the shape of the embryonic nervous system that could be used to discover aberrations caused by genetic mutations. Within just a few years, which were spent screening a growing number of deficiencies and EMS-induced mutations, José and his students had identified mutations leading to an absence of neurons, and to an overabundance of them, and thus began the characterization of the proneural and neurogenic genes.

> José will be remembered not only as a great scientist, but as a teacher and friend.

In 1982, José moved with his group to the University of Köln and entered an intensely productive phase of research and teaching. Here, the first *in situ* labelings of gene expression during neurogenesis were carried out, together with the fate mapping of the neurogenic region and the unraveling of the process of lateral inhibition during neuroblast determination. Almost overnight, neurogenetics became a crowded field. Then, during the late 1980s came the rewarding realization that flies and vertebrates were not so different in their genetic makeup after all. Frogs had their Xotch and Xash, mice their Motch and Mash. And with zebrafish offering the possibility of classical genetic analyses, José returned to his vertebrate roots, devoting the last ten years of his productive career to studying genes controlling early vertebrate neurogenesis.

José will be remembered not only as a great scientist, but as a teacher and friend. In the early 1980s, he organized a series of small discussion meetings at Simonswald in the Black Forest that were memorable for their intensity and informality. These meetings, and the *Drosophila* Neurobiology Courses that he organized at Cold Spring Harbor, were the starting point for many scientists now working in the fields of neural development and neurogenetics. These individuals, and the influential group of students and postdocs that he nurtured in his lab, are the most eloquent and fitting tribute to José's passionate engagement with science and with life. ■

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