

Foreword

Insects are vectors of parasites responsible for several diseases, considered neglected by the World Health Organization. In Brazil the major ones are: dengue, malaria, leishmaniasis and Chagas disease. All of them are endemic while dengue is hyperendemic with periodic epidemic bursts. Together, these diseases affect thousands of people every year with high mortality and morbidity, bringing serious economic losses for the country.

No clinically approved vaccines are available for any of these disorders. Therewith, vector control has been the preferred approach to reduce their incidence. However, there is still little knowledge about the genetics, evolution and behaviour of insect vectors, which would be valuable tools for the development of alternative control methods, always envisaged.

This special issue of *Memórias do Instituto Oswaldo Cruz* is devoted to studies on genetics and molecular basis of insect vectors behaviour. It consists of 14 original articles and reviews written by Brazilian and foreign scientists experts on several fields of entomology, especially on medical and molecular entomology. All of the invited papers in this edition are dedicated to the honour and memory of Alexandre Afranio Peixoto.



PHOTO BY GUTEMBERG BRITO

Alexandre Peixoto (21 Jan 1963-10 Feb 2013) graduated in biology at the Federal University of Rio de Janeiro and during his undergraduate and master's degree he analysed the chromosome inversion polymorphisms of *Drosophila mediopunctata*. His interest in the evolution of genes related to the control of circadian rhythms began in the course of the PhD, held in Leicester University (UK). Afterwards, during a post doc at Brandeis University (USA), he investigated mutations in ion channel-forming proteins that could lead to changes in the sounds emitted during copulation in *Drosophila melanogaster*. Back to Brazil in 1997, he applied the expertise in genetics and molecular evolution of *Drosophila* to study the *Lutzomyia longipalpis* complex. At that time there was still a strong controversy if this American visceral leishmaniasis vector is a single species or a group of sibling species. Alexandre and his group presented a solid collection of evidences showing that *Lu. longipalpis* is indeed part of a complex with at least seven species. Similar strategies helped to delineate part of the *Anopheles cruzii* and *Rhodnius prolixus* species complexes. In parallel, he started investigating the molecular basis of the circadian clock of *Aedes aegypti* (the main dengue vector in Americas) and *Culex quinquefasciatus* (vector of lymphatic filariasis and West Nile fever) and how the physiological changes in these insects can affect their vectorial capacity.

Alexandre was a remarkable scientist and published over 80 high quality papers in international journals, including Science, Proceedings of the National Academy of Sciences of the United States of America, Genetics and Trends in Genetics. He was an International Research Scholar of the Howard Hughes Medical Institute twice (2002-2012) and a fellow of the John Simon Guggenheim Memorial Foundation (2003). His research was considered creative and visionary as it differed from the common sense of what was done in insect vectors so far.

Throughout the 16 years as a researcher at the Oswaldo Cruz Institute (IOC) in Rio de Janeiro, he supervised 18 master's degree students and 14 PhD students and had collaboration with diverse national and international research groups. He was also the Coordinator of the Molecular and Cellular Post-Graduation course at IOC.

Alexandre was a brilliant man, passionate about science and very supportive to his students and colleagues. A lovely person who leaves a tremendous legacy to be followed and honoured. Those who had the honour to live and work with him are sure that his untimely departure leaves a void in our lives.

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