

## Histone magic in *Paramecium* mating pairs

Yasuhiro TAKENAKA<sup>1</sup>, Akira YANAGI<sup>2</sup>, Hiromi MASUDA<sup>1</sup> and Nobuyuki HAGA<sup>2</sup>

(<sup>1</sup>Institute for Biological Resources and Functions, National Institute of Advanced Industrial Science and Technology, VALWAY Technology Center, NEC Soft Ltd, <sup>2</sup>Department of Biotechnology, Ishinomaki Senshu University)

By using an expression vector harboring the *Paramecium* histone H2B gene conjugated with the codon-optimized yellow fluorescent protein (YFP) gene, PcVenus, we have found evidences relating to transport and incorporation of histone into the partner's nuclei during the conjugation process in *Paramecium caudatum*. We have also demonstrated sharing of histones among all types of nuclei in a mating pair including both the old and new generations of nuclei. When histone H2B was produced as a fusion protein with PcVenus, significant fluorescent signals was detected in both the micro- and macronuclei of a transformed cell. The transformants showed normal growth and high sexual activity indicating the normal function of histone H2B-PcVenus. When the transformant expressing histone H2B-PcVenus was mated with an untransformed cell, clear fluorescent signal was observed in the micro- and macronuclei of the untransformed cell as early as 7 hours after pair formation. This indicates the transport of histone H2B-PcVenus and/or its mRNA from one member of a mating pair to its mating partner and incorporation into the partner's nuclei. The discovery of exchange and shared use of histones among nuclei in mating pairs would be very important for the elucidation of epigenetic control mechanisms such as the histone code hypothesis in fertilization and early developmental processes.