

## References

- André, J. and Vivier, E. (1962) Quelques aspects ultrastucturaux de l'échange micronucléaire lors de la conjugation chez *Paramecium caudatum*. *J. Ultrastruct. Res.*, **6**, 390-406.
- Bestor, T. H. and Schatten, G. (1981) Anti-tubulin immunofluorescence microscopy of microtubules present during the pronuclear movement of sea urchin fertilization. *Dev. Biol.*, **88**, 80-91.
- Curtenaz, S., Wright, M. and Heckmann, K. (1997) Localization of  $\gamma$ -tubulin in the mitotic and meiotic nuclei of *Euplotes octocarinatus*. *Europ. J. Protistol.*, **33**, 1-12.
- Debec, A., Detraves, C., Montmory C., Geraud, G. and Wright, M. (1995) Polar organization of gamma-tubulin in acentriolar mitotic spindles of *Drosophila melanogaster* cells. *J. Cell Sci.*, **108**, 2645-2653.
- Delgado, M. A. and Conde, J. (1984) Benomyl prevents nuclear function in *Saccharomyces cerevisiae*. *Mol. Gen. Genet.*, **193**, 188-189.
- Dryl, S. (1959) Antigenic transformation *Paramecium aurelia* after homologous antiserum treatment during autogamy and conjugation. *J. Protozool.*, **6**, 25.
- Erickson, S. and Stoffer, D. (1996) Protofilaments and ring, two conformations of tubulin family conserved from bacterial FtsZ to  $\alpha/\beta$  and  $\gamma$ -tubulin. *J. Cell Biol.*, **135**, 5-8.
- Gaertig, J. and Fleury, A. (1992) Spatio-temporal reorganization of intracytoplasmic microtubules is associated with nuclear selection and differentiation during the developmental process in the ciliate *Tetrahymena thermophila*. *Protoplasma*, **167**, 74-87.
- Gard, D. L. (1994)  $\gamma$ -tubulin is asymmetrically distributed in the cortex of *Xenopus* oocytes. *Dev. Biol.*, **161**, 131-140.
- Grandchamp, S. and Beisson, J. (1981) Positional control of nuclear differentiation in *Paramecium*. *Dev. Biol.*, **81**, 336-341.
- Gueth-Hallonet, C., Antony, C., Aghion, J., Santa-Maria, A., Lajoie-Mazenc, I., Wright M. and Mario, B. (1993) Gamma-tubulin is present in acentriolar MTOCs during

- early mouse development. *J. Cell Sci.*, **105**, 157-166.
- Hamaguchi, M. S. and Hiramoto, Y. (1980) Fertilization process in the heart urchin, *Ciypeaster japonicus* observed with a differential interference microscope. *Develop. Groth and Differ.*, **22**, 517-530.
- Hamilton, E. P. and Suhr-Jessen, P. B. (1980) Autoradiographic evidence for self-fertilization in *Tetrahymena thermophila*. *Exp. Cell Res.*, **126**, 391-396.
- Hanyu, K., Takemasa, T., Numata, O., Takahashi, M. and Watanabe, Y. (1995) Immunofluorescence localization of a 25-kDa *Tetrahymena* EF-Hand  $\text{Ca}^{2+}$ -binding protein, TCBP-25, in the cell cortex and possible involvement in conjugation. *Exp. Cell Res.*, **219**, 487-493.
- Hirabayashi, T., Tamura, R., Mitsui, I. and Watanabe, Y. (1983) Investigation of actin in *Tetrahymena* cells. A comparison with skeletal muscle actin by a devise two-dimensional gel electrophoresis method. *J. Biochem.*, **93**, 461-468.
- Hiwatashi, K. (1968) Determination and inheritance of mating type in *Paramecium caudatum*. *Genetics*, **58**, 373-386.
- Hiwatashi, K. (1969) In Fertilization (Metz, C. B. and Monroy, A., eds.). Vol. 2, Academic Press, New York, pp. 255-293.
- Hiwatashi, K. (1981) In Sexual Interaction in Eukaryotic Microbes (O'Day, D. H. and Horgen, P. A., eds.). Academic Press, New York, pp. 351-378.
- Hoffman, J. C., Vaughn, K. C. and Joshi, H. C. (1994) Structural and immunocytochemical characterization of microtubule organizing centers in pteridophyte spermatogenous cell. *Protoplasma*, **179**, 46-60.
- Horio, T., Uzawa, S., Jung, M. K., Oakley, B. R., Tanaka, K. and Yanagida, M. (1991) The fission yeast  $\gamma$ -tubulin is essential for mitosis and is localized at microtubule organizing centers. *J. Cell Sci.*, **99**, 693-700.
- Huffaker, T. C., Thomas, J. H. and Botstein, D. (1988) Diverse effects of  $\beta$ -tubulin mutation on microtubule formation and function. *J. Cell Biol.*, **106**, 1997-2010.
- Inaba, F., Imamoto, K. and Suganuma, Y. (1966). Electron-microscopic observations on nuclear exchange during conjugation in *Paramecium multimicronucleatum*. *Proc. Japan Acad.*, **42**, 394-398.

- Ishida, M., Nakajima, Y., Kurokawa, K. and Mikami, K. (1999) Nuclear behavior and differentiation in *Paramecium caudatum*, analyzed by immunofluorescence with anti-tubulin antibody. *Zool. Sci.*, **16**, 915-926.
- John, V. F. and Benjamin, G. N. (1993) Solubilization and purification of enzymatically active Glutathione S-Transferase (pGEX) fusion proteins. *Anal. Biochem.*, **210**, 179-187.
- Joshi, H. C., Palacios, M. J., McNamara, L. and Cleveland, D. W. (1992)  $\gamma$ -tubulin is a centrosomal protein required for cell cycle-dependent microtubule nucleation. *Nature*, **356**, 80-83.
- Jurand, A. (1976) Some ultrastructural features of micronuclei during conjugation and autogamy in *Paramecium aurelia*. *J. General Microbiol.*, **94**, 193-203.
- Julian, M., Tollon, Y., Lajoie-Mazenc, I., Moisand, A., Mazarguil, H., Puget, A. and Wright, M. (1993)  $\gamma$ -Tubulin participates in the formation of the midbody during cytokinesis in mammalian cells. *J. Cell Sci.*, **105**, 145-156.
- Keryer, G., Garreau de Loubresse, N. G., Bordes, N. and Bornens, M. (1989) Identification of a spindle-associated protein in ciliate micronuclei. *J. Cell Sci.*, **93**, 287-298.
- Koizumi, S. (1974) Microinjection and transfer of cytoplasm in *Paramecium*: Experiment on the transfer of kappa particles into cell at different stages. *Exp. Cell Res.*, **88**, 74-78.
- Laemmli, U. K. (1970) Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature*, **277**, 680-685.
- Lanners, H. N. (1980) Pronuclei of *Heliophyra erhardi* matthes during conjugation and their association with coated uncoated microtubules. *J. Cell Sci.*, **45**, 245-256.
- Lajoie-Mazenc, I. L., Tollon, Y., Detraves, C., Julian, M., Moisand, A., Hallonet, C. G., Debuc, A., Passador I. S., Puget, A., Mazarguil, H., Messina, B. R. and Wright, M. (1994) Recruitment of antigenic gamma-tubulin during mitosis in animal cells: presence of gamma-tubulin in the mitotic spindle. *J. Cell Sci.*, **107**, 2825-2837.
- Liang, A., Ruiz, F., Heckmann, K., Klotz, C., Tollon, Y., Besson, J. and Wright, M. (1996) Gamma-tubulin is permanently associated with basal bodies in ciliates. *Eur.*

*J. Cell Biol.*, **70**, 331-338.

- Liu, B., Marc, J., Joshi H. C. and Palevitz B. A. (1993) A gamma-tubulin-related protein associated with the microtubule arrays of higher plants in a cell cycle-dependent manner. *J. Cell Sci.*, **104**, 1217-1228.
- McIntosh, J. R. (1983) In "Spatial Organization of Eukaryotic Cells" (McIntosh, J. R., eds.) Modern Cell Biol., Vol. 2, New York, pp.115-142.
- McIntosh, J. R. and Landis, S. C. (1971) The distribution of spindle microtubules during in cultured human cell. *J. Cell Biol.*, **49**, 468-497.
- Mikami, K. (1979) Stomatogenesis during sexual and asexual reproduction in an amicronucleate strain of *Paramecium caudatum*. *J. Exp. Zool.*, **208**, 121-128.
- Mikami, K. (1980) Differentiation of somatic and germinal nuclei correlated with intracellular localization in *Paramecium caudatum* exconjugants. *Dev. Biol.*, **80**, 46-55.
- Mikami, K. (1992) Behavior of germinal micronuclei under control of the somatic macronucleus during conjugation in *Paramecium caudatum*. *Dev. Biol.*, **149**, 317-326.
- Miyake, A. (1981) In "Biochemistry and Physiology of Protozoa" (Levandsky, M. and Hunter, S. H., eds.), 2nd ed., Vol. 4, Academic Press, New York, pp. 125-198.
- Nakajima, Y., Ishida, M. and Mikami, K. (2002) Microtubules mediate germ-nuclear behavior after meiosis in conjugation of *Paramecium caudatum*. *J. Euk. Microbiol.*, In press.
- Nanney, D. L. (1953) Nucleo-cytoplasmic interaction during conjugation in *Tetrahymena*. *Biol. Bull.*, **105**, 133-148.
- Navara, C. S., Simerly, C. and Schatten, G. (1995) Imaging motility during fertilization. *Theriogenology*, **44**, 1099-1114.
- Nelsen, E. M., Williams, N. E., Yi, H., Knaak, J. and Frankel, J. (1994) "Fenestrin" and conjugation in *Tetrahymena thermophila*. *J. Euk. Microbiol.*, **41**, 483-495.
- Numata, O., Sugai, T. and Watanabe, Y. (1985) Control of germ cell nuclear behavior at fertilization by *Tetrahymena* intermediate filament protein. *Nature*, **314**, 192-194.
- Oakley, B. R. (1992)  $\gamma$ -tubulin. The microtubule organizer? *Trends Cell. Biol.* **2**, 1-5.

- Oakley, B. R., Oakley, C. E. and Snyder, M. (1990)  $\gamma$ -tubulin is a component of the spindle pole body that is essential for microtubule function in *Aspergillus nidulans*. *Cell*, **61**, 1289-1301.
- Ogura, A. (1981) Deciliation and reciliation in *Paramecium* after treatment with ethanol. *Cell Struc. Func.*, **6**, 43-50.
- Orias, J. D., Hamilton, E. P. and Orias, E. (1983) A microtubule meshwork associated with gametic pronucleus transfer across a cell-cell junction. *Science*, **14**, 181-184.
- Palacios, M., Joshi, H. C., Simerly, C. and Schatten, G. (1993) Gamma-tubulin recognition during mouse fertilization and early development. *J. Cell Sci.*, **104**, 383-389.
- Preer, J. R., Peer, L. B., Rudman, B. M. and Barnett, A. J. (1985) Deviation from the universal code shown by the gene for surface protein 51A in *Paramecium*. *Nature*, **314**, 188-190.
- Roy, G. B. (1995) Analysis of the  $\gamma$ -tubulin sequences: implication for the functional properties of  $\gamma$ -tubulin. *J. Cell Sci.*, **108**, 2123-2130.
- Ruiz, F., Besson, J., Rossier, J. and Dupuis-Williams, P. (1998) Basal body duplication in *Paramecium* requires  $\gamma$ -tubulin. *Curr. Biol.*, **9**, 43-46.
- Schliwa, M. and Van Blerkom, J. (1981) Structural interaction of cytoskeletal components. *J. Cell Biol.*, **90**, 222-235.
- Skoblo, I. I. and Ossipov, D. V. (1968) The autogamy during conjugation in *Paramecium caudatum*. Ehrbg. I. Study on the nuclear reorganization up to stage of the third syncaryon division. *Acta Protozool.*, **5**, 273-290.
- Smirnova, E. A. and Bajer, A. S. (1992) Spindle poles in higher plant mitosis. *Cell Motil. Cytoskel.*, **23**, 1-17.
- Smith, D.B. and Johnson, K. S. (1988) Related articles, books, protein, nucleotide, structure single-step purification of polypeptides expressed in *Escherichia coli* as fusions with glutathione S-transferase. *Gene*, **67**, 31-40.
- Sonneborn, T. M. (1947) Recent advances in the genetics of *Paramecium* and *Euplotes*. *Adv. Genet.*, **1**, 263-358.
- Sonneborn, T. M. (1954) Patterns of nucleocytoplasmic integration in *Paramecium*.

- Caryologia*, **1**, 307-325.
- Stearns, T., Eyans, L. and Kirschner, M. (1991) Gamma-tubulin is a highly conserved component of the centrosome. *Cell*, **65**, 825-836.
- Stevenson, I. (1972) Ultrastructure of nuclear division in *Paramecium aurelia*. *Aust. J. Biol. Sci.*, **25**, 775-799.
- Takahashi, M., Takeuchi, N. and Hiwatashi, K. (1974) Mating agglutination of cilia detached from complementation mating types of *Paramecium*. *Exp. Cell Res.*, **87**, 415-417.
- Vosskuhlerk, C. and Tiedtke, A. (1993) Magnetic separation of phagosomes of defined age from *Tetrahymena thermophila*. *J. Euk. Microbiol.*, **40**, 556-562.
- Wicherman, R. (1946) Direct observation of the transfer of pronuclei in living conjugants of *Paramecium bursaria*. *Science*, **104**, 505-506.
- Yang, X. and Takahashi, M. (1999) Disturbance of the determination of germinal and somatic nuclei by heat shock in *Paramecium caudatum*. *J. Euk. Microbiol.*, **46**, 49-55.
- Yanagi, A. (1987) Positional control of the fates of nuclei produced after meiosis in *Paramecium caudatum*: Analysis by nuclear transplantation. *Dev. Biol.*, **122**, 535-539.
- Yanagi, A. and Hiwatashi, K. (1985) Intracellular positional control of survival or degeneration of nuclei during conjugation in *Paramecium caudatum*. *J. Cell Sci.*, **79**, 237-246.
- Zheng, Y., Jung, M. K. and Oakley, B.R. (1991) Gamma-tubulin is present in *Drosophila melanogaster* and *Homo sapiens* and is associated with the centrosome. *Cell*, **65**, 817-823.
- Zheng, Y., Wong, M. L., Albert, B., and Mitchison, T. (1995) Nucleation of microtubule assembly by a  $\gamma$ -tubulin-containing ring complex. *Nature*, **378**, 578-583.