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Professor, Department of Medical Chemistry, Graduate School of
Medicine, Kyoto University



RESEARCH TOPICS

- Molecular mechanisms of apoptosis
- Engulfment and degradation of dead cells
- Asymmetrical distribution of phospholipids in plasma membranes

EDUCATION

1968- 1972 Undergraduate in the Faculty of Science, University of Tokyo,
1972- 1977 Graduate Student, Institute of Medical Science, University of Tokyo.

POSITIONS

1977- 1981 Post-Doctoral Fellow, Institute of Molecular Biology I, Univ. of Zürich
1982- 1987 Assistant Professor, Institute of Medical Science, Univ. of Tokyo
1987- 1998 Head, Department of Molecular Biology, Osaka Bioscience Institute
1995- 2007 Professor, Department of Genetics, Osaka University Medical School
2002- 2007 Professor, Integrated Biology Lab, Grad Sch of Frontier Biosci Osaka Univ.
2007-present Professor Emeritus, Osaka University
2007-present Professor, Dept of Medical Chemistry, Grad Sch of Medicine, Kyoto Univ.
2010-present Vice-Dean, Graduate School of Medicine, Kyoto University

AWARDS (SELECTED)

1994 Emil von Boehring Prize, Marburg University (Marburg, Germany)
1995 Pobert Koch Award, Koch Foundation (Bonn, Germany)
1996 Prix Lacassagne, French Cancer League (Paris, France)
1998 Asahi Prize, Asahi Press Foundation (Tokyo)
2000 Japan Academy Prize and Imperial Prize, Japan Academy (Tokyo)
2001 Person of Cultural Merit, Japanese Government (Tokyo)
2004 Cell Death Society Prize, International Cell Death Society (Dublin)
2010 Associate, The Japan Academy (Tokyo)
2012 Honorary Doctorate, University of Zurich (Zurich, Switzerland)
2012 Tomizo Yoshida Award, Japanese Cancer Association (Tokyo)

Editorial Board (SELECTED)

Immunity (1998-), Science (2000-2003), Genes to Cells (1995-), Cancer Cell (2001-)
Int. Immunol. (1997-) etc.



PUBLICATIONS (Selected)

- 1 Nagata, S., Taira, H., Hall, A., Johnsrud, L., Streuli, M., Ecsodi, J., Boll, W., Cantell, K. & Weissmann, C. Synthesis in *E. coli* of a polypeptide with human leukocyte interferon activity. *Nature* **284**, 316-320, 1980.
- 2 Nagata, S., Mantei, N. & Weissmann, C. The structure of one of the eight or more distinct chromosomal genes for human interferon- α . *Nature* **287**, 401-408, 1980.
- 3 Nagata, S., Tsuchiya, M., Asano, S., Kaziro, Y., Yamazaki, T., Yamamoto, O., Hirata, Y., Kubota, N., Oheda, M., Nomura, H. & Ono, M. Molecular cloning and expression of cDNA for human granulocyte colony-stimulating factor. *Nature* **319**, 415-418, 1986.
- 4 Fukunaga, R., Ishizaka-Ikeda, E., Seto, Y. & Nagata, S. Expression cloning of a receptor for murine granulocyte colony-stimulating factor. *Cell* **61**, 341-350, 1990.
- 5 Itoh, N., Yonehara, S., Ishii, A., Yonehara, M., Mizushima, S., Sameshima, M., Hase, A., Seto, Y. & Nagata, S. The polypeptide encoded by the cDNA for human cell surface antigen Fas can mediate apoptosis. *Cell* **66**, 233-243, 1991.
- 6 Watanabe-Fukunaga, R., Brannan, C.I., Copeland, N.G., Jenkins, N.A. & Nagata, S. Lymphoproliferation disorder in mice explained by defects in Fas antigen that mediates apoptosis. *Nature* **356**, 314-317, 1992.
- 7 Fukunaga, R., Ishizaka-Ikeda, E. & Nagata, S. Growth and differentiation signals mediated by two distinct regions in the cytoplasmic domain of G-CSF receptor. *Cell* **74**, 1079-1087, 1993.
- 8 Ogasawara, J., Watanabe-Fukunaga, R., Adachi, M., Matsuzawa, A., Kasugai, T., Kitamura, Y., Itoh, N., Suda, T. & Nagata, S. Lethal effect of the anti-Fas antibody in mice. *Nature* **364**, 806-809, 1993.
- 9 Suda, T., Takahashi, T., Golstein, P. & Nagata, S. Molecular cloning and expression of the Fas ligand: a novel member of the tumor necrosis factor family. *Cell* **75**, 1169-1178, 1993.
- 10 Takahashi, T., Tanaka, M., Brannan, C.I., Jenkins, N.A., Copeland, N.G., Suda, T. & Nagata, S. Generalized lymphoproliferative disease in mice, caused by a point mutation in the Fas ligand. *Cell* **76**, 969-976, 1994.
- 11 Enari, M., Hug, H. & Nagata, S. Involvement of an ICE-like protease in Fas-mediated apoptosis. *Nature* **375**, 78-81, 1995.
- 12 Nagata, S. & Golstein, P. The Fas death factor. *Science* **267**, 1449-1456, 1995.
- 13 Enari, M., Talanian, R.V., Wong, W.W. & Nagata, S. Sequential activation of ICE-like and CPP32-like proteases during Fas-mediated apoptosis. *Nature* **380**, 723-726, 1996.
- 14 Nagata, S. Apoptosis by death factor. *Cell* **88**, 355-365, 1997.
- 15 Enari, M., Sakahira, H., Yokoyama, H., Okawa, K., Iwamatsu, A. & Nagata, S. A caspase-activated DNase that degrades DNA during apoptosis and its inhibitor ICAD. *Nature* **391**, 43-50, 1998.
- 16 Sakahira, H., Enari, M. & Nagata, S. Cleavage of CAD inhibitor in CAD activation and DNA degradation during apoptosis. *Nature* **391**, 96-99, 1998.
- 17 Kawane, K., Fukuyama, H., Kondoh, G., Takeda, J., Ohsawa, Y., Uchiyama, Y. & Nagata, S. Requirement of DNase II for definitive erythropoiesis in the mouse fetal liver. *Science* **292**, 1546-1549, 2001.
- 18 Hanayama, R., Tanaka, M., Miwa, K., Shinohara, A., Iwamatsu, A. & Nagata, S. Identification of a factor that links apoptotic cells to phagocytes. *Nature* **417**, 182-187, 2002.
- 19 Nishimoto, S., Kawane, K., Watanabe-Fukunaga, R., Fukuyama, H., Ohsawa, Y., Uchiyama, Y., Hashida, N., Ohguro, N., Tano, Y., Morimoto, T., Fukuda, Y. & Nagata, S. Nuclear cataract caused by a lack of DNA degradation in the mouse eye lens. *Nature* **424**, 1071-1074, 2003.



- 20 Hanayama, R., Tanaka, M., Miyasaka, K., Aozasa, K., Koike, M., Uchiyama, Y. & Nagata, S. Autoimmune disease and impaired uptake of apoptotic cells in germinal centers of MFG-E8-deficient mice. *Science* **304**, 1147-1150, 2004.
- 21 Yoshida, H., Kawane, K., Koike, M., Mori, Y., Uchiyama, Y. & Nagata, S. Phosphatidylserine-dependent engulfment by macrophages of nuclei from erythroid precursor cells. *Nature* **437**, 754-758, 2005
- 22 Kawane, K., Ohtani, M., Miwa, K., Kizawa, T., Kanbara, Y., Yoshioka, Y., Yoshikawa, H. & Nagata, S.: Chronic polyarthritis caused by mammalian DNA that escapes from degradation in macrophages. *Nature*, **443**, 998-1002, 2006
- 23 Miyanishi, M., Tada, K., Koike, M., Uchiyama, Y., Kitamura, T. & Nagata, S.: Identification of Tim-4 as a phosphatidylserine receptor. *Nature*, **450**: 435-439. 2007
- 24 Kitano, M., Nakaya, M., Nakamura, T., Nagata, S. & Matsuda, M.: Imaging of Rab5 activity identifies essential regulators for phagosome maturation. *Nature* **453**: 241-245. 2008
- 25 Okabe, Y., Sano, T. & Nagata, S.: Regulation of the innate immune response by threonine phosphatase of Eyes absent. *Nature* **460**: 520-524. 2009
- 26 Nagata, S., Hanayama, R. & Kawane, K.: Autoimmunity and the Clearance of Dead Cells. *Cell* **140**: 619-630. 2010
- 27 Suzuki, J., Umeda, M., Sims JP. & Nagata, S.: Calcium-dependent phospholipid scrambling by TMEM16F. *Nature* **468**: 834-838. 2010