CURRICULUM VITAE

Fuyuhiko Tamanoi

Birth Date: January 29, 1948

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Citizenship: Japanese
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Education and Training:

Tokyo University, Tokyo, Japan	B.S.	1972	Biochemistry
Tokyo University, Tokyo, Japan	M.S.	1974	Biochemistry
Nagoya University, Nagoya, Japan	Ph.D.	1977	Molecular Biology
Harvard Medical School, Boston, MA.	Postdoctoral	1977-1980	

Academic Appointments:

1997 - Present	Professor, Department of Microbiology, Immunology and Molecular Genetics, University of California, Los Angeles (UCLA)
1993 - 1997	Associate Professor, Department of Microbiology and Molecular Genetics, University of California, Los Angeles (UCLA)
1992 - 1993	Associate Professor, Department of Biochemistry and Molecular Biology, the University of Chicago
1985 - 1992	Assistant Professor, Department of Biochemistry and Molecular Biology, The University of Chicago
1982 - 1985	Joint Lab Chief, DNA Synthesis Section, Cold Spring Harbor Laboratory, NY
1982 - 1985	Senior Staff Investigator, Cold Spring Harbor Laboratory, NY
1980 - 1982	Staff Investigator, Cold Spring Harbor Laboratory, NY
1980	EMBO Short Term Fellow, Institute for Genetics, University of Cologne
2015 – 2016	Visiting Professor, Tokushima University
2010 – 2012	Visiting Professor, Waseda University
2003 - 2007	Special Professor, Tokyo Institute of Technology
2002 - Present	Member, California Nanosystems Institute
1995- Present	Member, Jonsson Comprehensive Cancer Center, UCLA

1993- Present Member, Molecular Biology Institute, UCLA

Leadership Roles

1996 - Present Director, Signal Transduction and Therapeutics Program Area, Jonsson Comprehensive Cancer Center, UCLA
2004 – Present Associate Director, Center for Global Mentoring, UCLA
2008 – 2010 Research Director, California NanoSystems Institute, UCLA
2004 – 2011 Vice Chair, Dept. of Microbiology, Immunology and Molecular Genetics
2004 – 2007 Co-group Leader, NanoBiotechnology, California NanoSystems Institute
1997 - 1999 Vice Chair, Joint Departments of Microbiology & Immunology/ Microbiology & Molecular Genetics, University of California, Los Angeles (UCLA)
1997 Acting Chair, Department of Microbiology and Molecular Genetics, University of California, Los Angeles (UCLA)
1989- 1994 Established Investigator, American Heart Association

My work on **nanoparticles** was initiated about ten years ago when we established an interdisciplinary center called "Nanomachine Center for Targeted Delivery and On-command Release" at the California NanoSystems Institute (CNSI) at UCLA. I also served as the Research Director of CNSI for two years coordinating research on nanotechnology. Our work on nanoparticles represents our long standing collaboration with Prof. Jeffrey Zink who has pioneered the development of nanovalve equipped mechanized nanoparticles. Since 2007, Dr. Zink and I have published fifteen co-authored peer-reviewed papers and made a number of joint presentations at meetings. We continue to carry out highly productive collaboration on developing novel nanoparticles for delivering anticancer drugs and siRNA.

My work also encompasses topics concerning **signal transduction** and **anticancer drug** development. My work on signal transduction was initiated when I was at Cold Spring Harbor Laboratory working on the *RAS* oncogenes and continued at the University of Chicago where I studied membrane association of RAS proteins. We have also worked on other members of the RAS superfamily G-proteins including RHEB that is an activator of mTOR (mammalian Target of Rapamycin). Our work on cancer therapy is focused on an approach to inhibit membrane association of the RAS superfamily proteins. We were one of the first groups to identify and characterize protein farnesyltransferase and protein geranylgeranyltransferases that facilitate the membrane association. We were also one of the first groups to identify small molecule inhibitors of protein farnesyltransferase; we identified natural compounds as the inhibitors. At UCLA, I continued to work on the development of farnesyltransferase inhibitors. More recently, we have developed novel GGTI, inhibitors of protein geranylgeranyltransferase type I. Antitumor activity of GGTI was demonstrated using animal model systems. Since1996, I have directed the Signal Transduction and Therapeutics program at Jonsson Comprehensive Cancer Center.

Editorial Board:

Journal of Biological Chemistry, Editorial Board, 1997-2002, 2008-2013

Series-Editor, The Enzymes, Academic Press/Elsevier

Since 2002, I have been a series editor for The Enzymes published by Academic Press/Elsevier and published 18 books. Two books published recently are:

1. The Enzymes: volume 37 "Mechanism of the Anticancer Effect of Phytochemicals" Bathaie, SZ. and Tamanoi, F. Academic Press/Elsevier (2015).
2. The Enzymes: volume 38 "Platelet-Activating Factor Acetylhydrolases (PAF-AH)" Inoue, K., Stafforini, DM. and Tamanoi, F., Academic Press/Elsevier (2015).

Grant Review Panels

NSF Signal Transduction and Cellular regulation panel member (2004 - 2008)
NIH Molecular and Integrative Signal Transduction Study Section member (2007 - 2012)
NIH Special Emphasis panel on Program grants

I have served on many study-section meetings as an ad hoc member. The most recent meetings include Nano study section meeting (November 2016) and Program Project meeting (February 2017)

Memberships:

American Association for the Advancement of Science (1985)
American Society for Biochemistry and Molecular Biology (1987)
American Association for Cancer Research
NNFF International Consortium on Molecular Biology of NF1 and NF2 (1990)
Sigma XI (1990)

Teaching:

My main teaching responsibility at UCLA is "Life Sciences 3, Introduction to Molecular Biology". This is a required class for Undergraduate Life Sciences major and each class has 300-400 students.

In addition to regularly scheduled seminar meetings, I taught
Basic Concepts in Oncology
Global Nanocancer seminar
Immunobiology of Cancer
Preparation for Teaching Microbiology in Higher Education
Nucleic Acid Biochemistry

LECTURES AND PRESENTATIONS:

November 2016: Keynote speech, Nanomedicine society meeting, Tsukuba
February 2016: Keynote speech, NanoEngineering for Medicine and Biology Conference, Houston, TX.
December 2015: Keynote speech, 9th International Symposium on Nanomedicine, Tsu, Japan
September 2015: Co-organizer and plenary speech, The 2nd Gene and Immunotherapy Conference, Ho Chi Minh city, Vietnam.
July 2015: Keynote speech, Tokushima Nanomedicine Symposium, Japan

May 2015, Invited talk, OIST Minisymposium, Okinawa, Japan
March 2015: Invited talk, 3rd Nanomedicine for Imaging and Treatment Conference, Cedars-Sinai Medical Center.
March 2015: Invited talk, PITTCON 2015 Conference, New Orleans.
December 2014: Plenary talk, 8th International Symposium on Nanomedicine, Matsuyama, Japan
August 2014: Invited talk, Moving Targets 2014 "New Horizons in Anti-Cancer Therapeutics" USC, Los Angeles.
March 2014: Invited talk, Structural Biology, Proteomics and Cancer Symposium, VNU-HCM.
November 2013, Plenary talk, 7th International Symposium on Nanomedicine, Kita-Kyushu, Japan.
October 2013: Organizer, Nanotechnology Innovations in Cancer, Infectious Diseases and Regenerative Medicine, UCLA.
July 2013: Invited Speaker, Second International Conference on Innovative Biology, Medicine and Engineering, Nagoya, Japan.
February 2013: Invited Speaker, Expert Meeting for Cancer Research, Vietnam National University, Ho Chi Minh City, Vietnam.
January 2013: Organizer, Nanotechnology Cancer Asia-Pacific Network videoconference
September 2012: Invited Speaker, Northeastern Asian Symposium, Sendai, Japan
September 2012: Invited Speaker, GTC Bio meeting on Drug Delivery Technologies and Formulation, Zurich, Switzerland.
September 2012: Invited Speaker, Northeastern Asian Symposium, Sendai, Japan.
May 2012: Co-organizer, Kavli Workshop on Physics and Mathematics of Cancer, UC Santa Barbara.
April 2012: Keynote presentation, First International Conference on Innovative Biology, Medicine and Engineering, Nagoya, Japan.
March 2012: Fifth International Symposium on Nanomedicine, Nagoya, Japan.
March 2012: Invited Speaker, Nano-Bio Collaborative International Conference, Tampa, FL.
November 2011: Invited Speaker, Seoul NanoHealth 2011, Seoul, Korea.
October 2011: Invited Speaker and Session Chair, the 5th International Workshop on Cell Regulations in Division and Arrest, Okinawa, Japan.
July 2011: Session Chair and Invited Speaker, FASEB Summer Conference on "Protein Lipidation, Signaling and Membrane Domains", Saxton River, VT.

Publications:

1. Tamanoi, F., Uchida, T., Egami, F. and Oshima, T. (1976) Synthesis of various phosphodiesters and phosphomonoesters with ribonuclease N1. *J. Biochem.* **80**, 27-32.

2. Hirose, S., Okazaki, R. and Tamanoi, F. (1973) Mechanism of DNA chain growth. XI. Structure of RNA-linked DNA fragments of *E. coli*. *J. Mol. Biol.* **77**, 501-517.

3. Okazaki, R., Okazaki, T., Hirose, S., Sugino, A., Ogawa, T., Kurosawa, Y., Shinozaki, K., Tamanoi, F., Seki, T., Machida, Y., Fujiyama, A. and Kohara, Y. (1975) Discontinuous replication in prokaryotic systems. In: *DNA Synthesis and Its Regulation*, Vol. III. (M. Goulian & P. Hanawalt, eds.; F. Fox series ed.) ICN-UCLA Symposium on Molecular and Cellular Biology, W.A. Benjamin, California, p.832.

4. Tamanoi, F., Okazaki, T. and Okazaki, R. (1977) Persistance of RNA attached to nascent short DNA pieces in *Bacillus subtilis* cells defective in DNA polymerase I. *Biochem. Biophys. Res. Commun.* **77**, 290-297.

5. Tamanoi, F. and Okazaki, T. (1978) Uracil incorporation into nascent DNA fragments of thymine requiring mutant of *B. subtilis* 168. *Proc. Natl. Acad. Sci. USA* **75**, 2195-2199.

6. Okazaki, T., Kurosawa, Y., Ogawa, T., Seki, T., Shinozaki, K., Hirose, S., Fujiyama, A., Kohara, Y., Machida, Y., Tamanoi, F. and Hozumi, T. (1979). Structure and metabolism of the RNA primer in the discontinuous replication of prokaryotic DNA. *Cold Spring Harbor Symp. Quant. Biol*. **43**, 203-219.

7. Tamanoi, F., Machida, Y. and Okazaki, T. (1979) Uracil incorporation into nascent DNA by *B. subtilis* and *E. coli*. *Cold Spring Harbor Symp. Quant. Biol.* **43**, 239-242.

8. Richardson, C.C., Romano, L.J., Kolodner, R., LeClerc, J.E., Tamanoi, F., Engler, M.J., Dean, F.B. and Richardson, D.S. (1979) Replication of bacteriophage T7 DNA by purified proteins. *Cold Spring Harbor Symp. Quant. Biol.* **43**, 427-440.

9. Campbell, J.L., Tamanoi, F., Richardson, C.C. and Studier, F.W. (1979) Cloning of the T7 genome in *E. coli*: Use of recombination between cloned sequences and bacteriophage T7 to identify genes involved in recombination and a clone containing the origin of T7 DNA replication. *Cold Spring Harbor Symp. Quant. Biol.* **443**, 441-448.

10. Tamanoi, F., Saito, H., and Richardson, C.C. (1980) Physical mapping of primary and secondary origins of bacteriophage T7 DNA replication. *Proc. Natl. Acad. Sci. USA* **77**, 2656-2660.

11. Saito, H., Tabor, S., Tamanoi, F., and Richardson, C.C. (1980) Nucleotide sequence of the primary origin of bacteriophage T7 DNA replication: relationship to adjacent genes and regulatory elements. *Proc. Natl. Acad. Sci. USA* **77**, 3917-3921.

12. Tamanoi, F., Engler, M.J., Lechner, R., Orr-Weaver, T., Romano, L.J., Saito, H., Tabor, S. and Richardson, C.C. (1980) In: *Mechanistic Studies of DNA Replication and Genetic Recombination*, (B. Alberts, ed.) Academic Press, New York, pp. 411-428.

13. Romano, L.J., Tamanoi, F. and Richardson, C.C. (1981) Initiation of DNA repication at the primary origin of bacteriophage T7 by purified proteins: requirements for T7 RNA polymerase. *Proc. Natl. Acad. Sci. USA* **78**, 4107-4111.

14. Deuring, R., Winterhoff, U., Tamanoi, F., Stabel, S., and Doerfler, W. (1981) Site of linkage between adenovirus type 12 and cell DNAs In hamster tumor line CLAC3. *Nature* **293**, 5827, 81-84.

15. Tamanoi, F., and Stillman, B.W. (1982) Function of adenovirus terminal protein in the

initiation of DNA replication. *Proc. Natl. Acad. Sci. USA* **79**, 2221-2225.

16. Stillman, B.W. and Tamanoi, F. (1982) Adenovirus DNA replication: DNA sequences and enzymes required for initiation *in vitro. Cold Spring Harbor Symp. Quant. Biol.* **47**, 741-750.

17. Stillman, B.W., Tamanoi, F., and Mathews, M.B. (1982) Purification of an adenovirus coded DNA polymerase that is required for initiation of DNA replication. *Cell* **31**, 613-623.

18. Tamanoi, F., and Stillman, B.W. (1983) Initiation of adenovirus DNA replication *in vitro* requires a specific DNA sequence. *Proc. Natl. Acad. Sci. USA* **80**, 6446-6450.

19. Tamanoi, F. and Stillman, B.W. (1983) The origin of adenovirus DNA replication. In: *Current Topics in Microbiology and Immunology*. **109**, 75-87.

20. Guggenheimer, R.A., Stillman, B.W., Nagata, K., Tamanoi, F. and Hurwitz, J. (1984) DNA sequences required for the *in vitro* replication of adenovirus DNA. *Proc. Natl. Acad. Sci. USA* **81**, 3069-3073.

21. Hughes, S., Mellstrom, K., Kosik, E., Tamanoi, F., and Brugge, J. (1984) Mutation of a termination codon affects *src* initiation. *Mol. Cell. Biol.* **4**, 1738-1746.

22. Fasano, O., Aldrich, T., Tamanoi, F., Taparowsky, E., Furth, M. and Wigler, M. (1984) Analysis of the transforming potential of the human *H-ras* gene by random mutagenesis. *Proc. Natl. Acad. Sci. USA* **81**, 4008-4012.

23. Tamanoi, F., Walsh, M., Kataoka, T., and Wigler, M. (1984) A product of yeast *RAS2* gene is a guanine nucleotide binding protein. *Proc. Natl. Acad. Sci. USA* **81**, 6924-6928.

24. Tamanoi, F., Rao, M., Samiy, N., and Walsh, M. (1985) Enzymatic properties of yeast RAS2 protein. In: *Cancer Cells* **3**, 251-256 (Cold Spring Harbor Laboratory).

25. Broek, D., Samiy, N., Fasano, O., Fujiyama, A., Tamanoi, F., Northup, J., and Wigler, M. (1985) Differential activation of yeast adenylate cyclase by wild-type and mutant *RAS* proteins. *Cell* **41**, 763-769.

26. Tamanoi, F. (1986) On the mechanism of adenovirus DNA replication. In: *Develop-ments in Molecular Virology* Vol. 8, "Adenovirus DNA: The Viral Genome and Its Expression" (W. Doerfler, ed.), Martinus Nijhoff Publishing, Boston, pp. 97-128.

27. Fujiyama, A. and Tamanoi, F. (1986) Processing and fatty acylation of *RAS1* and *RAS2* proteins in *Saccharomyces cerevisiae*. *Proc. Natl. Acad. Sci. USA* **83**, 1266-1270.

28. Fujiyama, A., Samiy, N., Rao, M. and Tamanoi, F. (1986) Biochemistry of yeast *RAS1* and *RAS2* proteins. In: *Yeast Cell Biology* (ed. Hicks, J.) Alan R. Liss, Inc., New York, pp. 125-149.

29. Fujiyama, A., Matsumoto, K., and Tamanoi, F. (1987) A novel yeast mutant deficient in the processing of ras proteins: Assessment of the effect of the mutation on processing steps. *EMBO J.* **6**, 223-228.

30. Tamanoi, F., Hseuh, E.C., Goodman, L.E., Cobitz, A.R., Detrick, R.J., Brown, W.R., and Fujiyama, A. (1988) Post-translational modification of ras proteins: Detection of a modification prior to fatty acid acylation and cloning of a gene responsible for the modification. *J. Cell. Biochem.* **36**, 261-273.

31. Tamanoi, F. (1988). Yeast *RAS* genes. *Biochem. Biophys. Acta* **948**, 1-15.

32. Goodman, L.E., Perou, C.M., Fujiyama, A. and Tamanoi, F. (1988) Structure and expression of yeast *DPR1,* a gene essential for the processing and intracellular localization of ras proteins. *Yeast* **4**, 271-281.

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34. Tamanoi, F., Cobitz, A.R., Fujiyama, A., Goodman, L.E. and Perou, C.M. (1989) Post-translational modification of ras proteins: Palmitoylation and phosphorylation of yeast RAS proteins. In: *RAS Oncogenes* (ed. D. Spandidos) Plenum Press, New York and London, 225-233.

35. Fujiyama, A. and Tamanoi, F. (1990) RAS2 protein of *S. cerevisiae* undergoes removal of methionine at N-terminus and removal of three amino acids at C-terminus. *J. Biol. Chem.* **265**, 3362-3368.

36. Finegold, A.A., Schafer, W.R., Rine, J., Whiteway, M., and Tamanoi, F. (1990) Common modifications of trimeric G proteins and ras protein: Involvement of polyisoprenylation. *Science* **249**, 165-171.

37. Tanaka, K., Nakafuku, M., Tamanoi, F., Kaziro, Y., Matsumoto, K., and Toh-e, A. (1990) *IRA2,* a second gene of *Saccharomyces cerevisiae* that encodes a protein with a domain homologous to mammalian ras GTPase activating protein. *Mol. Cell. Biol.* **10**, 4303-4313.

38. Goodman, L.E., Judd, S.E., Farnsworth, C.C., Powers, S., Gelb, M.H., Glomset, J.A. and Tamanoi, F. (1990) Mutants of *Saccharomyces cerevisiae* defective in the farnesylation of ras proteins. *Proc. Natl. Acad. Sci. USA* **87,** 9665-9669.

39. Xu, G., Lin, B., Tanaka, K., Dunn, D., Wood, D., Gesteland, R., Weiss, R. and Tamanoi, F. (1990) The catalytic domain of the neurofibromatosis type 1 gene product stimulates ras GTPase and complements *ira* mutants of *S. cerevisiae*. *Cell* **63,** 835-841.

40. Tanaka, K., Lin, B.K., Wood, D.R. and Tamanoi, F. (1991) IRA2, an upstream negative

regulator of RAS in yeast, is a RAS GTPase activating protein (GAP). *Proc. Natl. Acad. Sci. USA* **88**, 468-472.

41. Tamanoi, F. (1996) DPR1/RAM1. In Guidebook to the small GTPases (eds. Zerial, M. and Huber, L.) Oxford University Press, 52-56.

42. Tamanoi, F. (1996) RAM2. In Guidebook to the small GTPases (eds. Zerial, M. and Huber, L.) Oxford University Press, 50-52.

43. Judd, S.R. and Tamanoi, F. (1991) A genetic approach to the study of farnesylation. *"Methods"* A companion to *Methods in Enzymology* **1,** 246-252.

44. Finegold, A.A., Johnson, D.I., Farnsworth, C.C., Gelb, M.H., Judd, S.R., Glomset, J.A. and Tamanoi, F. (1991) Protein geranylgeranyl transferase of *Saccharomyces cerevisiae* is specific for Cys-Xaa-Xaa-Leu motif proteins and requires the *CDC43* gene product, but not the *DPR1* gene product. *Proc. Natl. Acad. Sci. USA* **88,** 4448-4452.

45. Ohya, Y., Goebel, M., Goodman, L.E., Petersen-Bjorn, S., Friesen, J.D., Tamanoi, F. and Anraku, Y. (1991) Yeast *CAL1* is a structural and functional homologue to the *DPR1 (RAM)* gene involved in ras processing. *J. Biol. Chem.* **266,** 12356-12360.

46. Fujiyama, A., Tsunasawa, S., Tamanoi, F. and Sakiyama, F. (1991) S-Farnesylation and methyl esterification of C-terminal domain of yeast RAS2 protein prior to fatty acid acylation. *J. Biol. Chem* **266,** 17926-17931.

47. Golubic, M., Tanaka, K., Dobrowski, S., Wood, D., Tsai, M.H., Marshall, M., Tamanoi, F. and Stacey, D.W. (1991) The GTPase stimulatory activities of the neurofibromatosis type 1 and the yeast IRA2 proteins are inhibited by arachidonic acid. *The EMBO J.* **10**, 2897-2903.

48. McNeel, D.G. and Tamanoi, F. (1991) Terminal region recognition factor 1, a DNA-binding protein recognizing the inverted terminal repeats of the pGKl linear DNA plasmids. *Proc. Natl. Acad. Sci. USA* **88**, 11398-11402.

49. Tanaka, K., Wood, D.R., Lin, B.K., Khalil, M., Tamanoi, F. and Cannon, J.F. (1992) A dominant activating mutation in the effector region of RAS abolishes IRA2 sensitivity. *Mol. Cell. Biol.* **12**, 631-637.

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51. Hara, M., Akasaka, K., Akinaga, S., Okabe, M., Nakano, H., Gomez, R., Wood, D., Uh, M. and Tamanoi, F. (1993) Identification of ras farnesyltransferase inhibitors by microbial screening. *Proc. Natl. Acad. Sci. USA* **90**, 2281-2285.

52. Tamanoi, F. (1993) Inhibitors of ras farnesyltransferases. *TIBS*, **18**, 349-353.

53. Wilson, B., Khalil, M., Tamanoi, F. and Cannon, J.F. (1993) New activated RAS2 mutations identified in *Saccharomyces cerevisiae*. *Oncogene*, **8**, 3441-3445.

54. Diaz, M., Sanchez, Y., Bennett, T., Sun, C.R., Godoy, C., Tamanoi, F., Duran, A. and Perez, P. (1993) The *Schizosaccharomyces pombe cwg2+* gene codes for the ß subunit of a geranylgeranyltransferase type I required for ß-glucan synthesis. *The EMBO Journal*. **12**, 5245-5254.

55. Poullet, P., Lin, B., Esson, K. and Tamanoi, F. (1994) Functional significance of lysine-1423 of neurofibromin and characterization of a second site suppressor which rescues mutation at this residue and suppresses $RAS2^{val19}$ activated phenotypes. *Mol. Cell. Biol*. **14**, 815-821.

56. Wood, D.R., Poullet, P., Wilson, B.A., Khalil, M., Tanaka, K., Cannon, J.F. and Tamanoi, F. (1994) Biochemical characterization of yeast RAS2 mutants reveals a new region of ras protein involved in the interaction with GTPase activating proteins. *J. Biol. Chem.* **269**, 5322-5327.

57. Cohen, L., Mohr, R., Chen, Y-Y, Huang, M., Kato, R., Dorin, D., Tamanoi, F., Goga, A., Afar, D., Rosenberg, N. and Witte, O. (1994) Transcriptional activation of a novel ras-like gene (kir) by oncogenic tyrosine kinases. *Proc. Natl. Acad. Sci. USA* **91**, 12448-12452.

58. Mitsuzawa, H., Esson, K. and Tamanoi, F. (1995) Mutant farnesyltransferase ß subunit of *Saccharomyces cerevisiae* that can substitute for geranylgeranyltransferase type I ß subunit. *Proc. Natl. Acad. Sci. USA* **92**, 1704-1708.

59. Mitsuzawa, H. and Tamanoi, F. (1995) *In vivo* assays for farnesyltransferase inhibitors with *Saccharomyces cerevisiae*. *Methods in Enzymology* **250**, 43-51.

60. Tamanoi, F. and Mitsuzawa, H. (1995) Use of yeast for the identification of farnesyltransferase inhibitors and for generation of mutant farnesyltransferases. (1995) *Methods in Enzymology* **255**, 82-91.

61. Poullet, P. and Tamanoi, F. (1995) Use of the yeast two-hybrid system to evaluate Ras interactions with neurofibromin-GAP. *Methods in Enzymology* **255**, 488-497.

62. Baba, H., Fuss, B., Urano, J., Poullet, P., Watson, J.B., Tamanoi, F. and Macklin, W.B. (1995) GapIII, a new brain-enriched member of the GTPase-activating protein family. *J. Neurosci. Res.* **41**, 846-858.

63. Gelb, M.H., Tamanoi, F., Yokoyama, K., Ghomashchi, F., Esson, K. and Gould, M.N. (1995) The inhibition of protein prenyltransferases by oxygenated metabolites of limonene and perillyl alcohol. *Cancer Letters* **91**, 169-175.

64. Dorin, D., Cohen, L., DelVillar, K., Poullet, P., Mohr, R., Whiteway, M., Witte, O. and Tamanoi, F. (1995) Kir, a novel ras-family G-protein induces pseudohyphal growth in

Saccharomyces cerevisiae. *Oncogene* **11**, 2267-2271.

65. Morcos, P., Thapar, N., Tusneem, N., Stacey, D. and Tamanoi, F. (1996) Identification of neurofibromin mutants that exhibit allele specificity or increased Ras affinity resulting in suppression of activated *ras* alleles. *Mol. Cell. Biol.* **16**, 2496-2503.

66. Del Villar, K., Dorin, D., Sattler, I., Urano, J., Poullet, P., Robinson, N., Mitsuzawa, H. and Tamanoi, F. (1996) C-terminal motifs found in Ras-superfamily G-proteins: CAAX and C-seven motifs. *Biochem Soc. Trans.* **24**, 709-713.

67. Sattler, I. and Tamanoi, F. (1996) Prenylation of Ras and inhibitors of prenyltransferases. In *Regulation of the RAS signalling network* (ed. H. Maruta) Molecular Biology Intelligence Unit Series, R.G. Landes, Austin, TX. pp 95-137.

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