University of California, San Francisco **Updated: 2/4/2015**

CURRICULUM VITAE

Name: **Frank McCormick, PhD, FRS, DSc (Hon)**

Position: David A. Wood Distinguished Professor of Tumor Biology and Cancer Research

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EDUCATION:

1968-72	University of Birmingham, England, UK	B.Sc.	Biochemistry
1972-75	University of Cambridge, England, UK	Ph.D.	Biochemistry

PRINCIPAL POSITIONS HELD:

1975-1978	State University of New York at Stony Brook	Fellow	Prof. Seymour S. Cohen
1978-1981	Imperial Cancer Research Fund, London	Fellow	Dr. Alan Smith
1981-1990	Cetus Corporation		Director of Molecular Biology
1990-1991	Cetus Corporation		Vice President, Research
1991-1992	Chiron Corporation		Vice President, Research
1992-1996	Onyx Pharmaceuticals		Founder, Chief Scientific Officer
1997-2014	University of California, San Francisco Helen Diller Family Comprehensive Cancer Center and Cancer Research Institute		Director
1997-2014	University of California, San Francisco, School of Medicine		Associate Dean
1997-2013	University of California, San Francisco, Department of Microbiology and Immunology		Professor
2013-present	University of California, San Francisco, Department of Microbiology and Immunology		Professor-Emeritus
2013-present	University of California, San Francisco, Helen Diller Family Comprehensive Cancer Center and Cancer Research Institute		Professor-Emeritus
2013-present	Leidos/Frederick National Laboratory for Cancer Research National Ras Program		Co-leader

HONORS AND AWARDS:

1996	Fellow of the Royal Society
2002	Bristol Myers Squibb Unrestricted Cancer Research Grant
2002	AACR – G.H.A. Clowes Memorial Award
2002	Novartis Drew Award in Biomedical Research
2003	University of Chicago, Cancer Research Center, Shubitz Award
2004	Nomination, Alfred P. Sloan, Jr. Prize, General Motors Cancer Research Foundation
2005	Institute of Medicine
2008	Salute to Excellence Award, American Liver Foundation
2008	Honorary Degree, Doctor of Science, University of Birmingham, England, UK
2010	ASCO Science of Oncology Award
2013	AACR Fellow of the AACR Academy
2014	National Academy of Sciences
2015	Memorial Sloan Kettering, Stock Award

KEYWORDS/AREAS OF INTEREST:

Cancer, virology, Ras, p53, oncogenes, tumor suppressors, neurofibromatosis, protein kinases

PROFESSIONAL ACTIVITIES:

PROFESSIONAL ORGANIZATIONS

Memberships

1997-present	American Association for Cancer Research
1997-present	American Society for Microbiology
1998-present	American Association for the Advancement of Science
1998-present	American Society of Gene Therapy
2005-present	Institute of Medicine
2008-2014	American Society of Clinical Oncology
2015 – present	National Academy of Sciences

Service to Professional Organizations

1997-2003	ONYX Pharmaceuticals	Scientific Advisory Board
1998-1999	NCI Developmental Therapeutics Program	Scientific Advisory Board
1998-2003	NCI Board of Scientific Counselors	Advisory Committee
1998-2001	ICONIX Pharmaceuticals	Scientific Advisory Board
1998-2004	The Jackson Laboratory Bar Harbor, Maine	Scientific Advisory Board
1998-2007	Friedrich Miescher-Institut	External Advisory Board
2000-present	Van Andel Institute	Scientific Advisory Board
2001-2002	Sagres	Scientific Advisory Board
2001-present	University of Wisconsin Comprehensive Cancer Center	External Advisory Board
2002-2005	American Association for Cancer Research	Board of Directors
2002-2006	Alberta Cancer Board	Advisory Committee on Research
2002-2007	Alliance for Cancer Gene Therapy	Scientific Advisory Council
2003-2006	Association of American Cancer Institutes	Board of Directors
2003-2010	Memorial Sloan-Kettering Cancer Center	Board of Scientific Consultants
2003-2014	Exelixis, Inc	Board of Directors
2003-present	NCI Initiative for Chemical Genetics	External Review Committee
2003-2008	Nexgenix Pharmaceuticals, LLC	Scientific Advisory Board
2004-2009	Emory Winship Cancer Institute	External Advisory Board
2004-present	Canary Foundation	Scientific Advisory Board
2005-2007	Friends of Cancer Research	Scientific Advisory Board
2005-2007	UT Southwestern Medical Center, Harold C. Simmons	External Advisory Board

	Comprehensive Cancer Center	
2005-2008	American Association for Cancer Research	Finance Committee
2005-present	Columbia University, New York, Herbert Irving Comprehensive Cancer Center	Chair, Scientific Advisory Board
2005-present	Aglaia Biomedical Ventures B.V.	Scientific Advisory Board
2006-2007	Burnham Institute for Medical Research	Scientific Advisory Board
2006-2012	Fluidigm Corporation	Scientific Advisory Board
2006-2007	KineMatik Limited	Scientific Advisory Board
2006-2008	MannKind Corporation	Scientific Advisory Board
2006-present	Melanoma Therapeutics Foundation	Board and Scientific Advisory Board
2007-2008	BiPar Sciences	Scientific Advisory Board
2007-present	Daiichi-Sankyo, Ltd.	Scientific Advisory Board
2008-present	TriAct Therapeutics, Inc	Scientific Advisory Board
2008-present	ORCA Therapeutics, Inc	Board of Directors
2008-present	Dana-Farber/Harvard Cancer Center	External Advisory Board
2008-2010	Arresto Biosciences	Board of Directors
2008-2013	Life Sciences Institute	Scientific Advisory Board
2009-present	Van Andel Institute	Faculty Committee Review
2009-present	Dicerna	Scientific Advisory Board
2009-present	Jennerex Biotherapeutics, Inc.	Scientific Advisory Board
2010-present	Aduro BioTech	Board of Directors and Scientific Advisory Board
2010-2012	Duke University	Scientific Advisory Board
2010-present	Portola Pharmaceuticals	Translational Advisory Board
2011-2012	American Association for Cancer Research (AACR)	President-Elect
2011-present	Pancreatic Cancer Action Network	Scientific Advisory Board
2011-present	Stanford Molecular Imaging Scholars (SMIS) Postdoctoral Training Program	External Advisory Board
2012-2013	American Association for Cancer Research (AACR)	President
2012-2013	AACR-MICR Minority-Serving Institution Faculty-Cancer Center Collaboratives	Mentor
2012-2013	USC Norris Comprehensive Cancer Center	External Advisory Board
2012-2015	NewtCo	Scientific Advisory Board
2012-2013	Didimi, Inc.	Scientific Advisory Board
2013-present	University of California, San Francisco Discovery Fellows Program	Faculty Advisory Board

RESEARCH AWARDS AND GRANTS:

CURRENT

1U01 CA168370 (McCormick, McManus, Weissman, MPI) 5/1/12-4/30/17
NIH/NCI $274,954 direct/yr 01
Bay Area Cancer Target Discovery and Development Network
As important as the cancer genome sequencing initiatives are, the identification and cataloguing of large numbers of variations is only the first step in efforts to provide a scientific foundation for therapeutic breakthroughs. To achieve this broader goal, we must now understand how these variations alone and critically in combination contribute to the malignant properties of human tumors. This program aims to fill this void.
Role: Multi-PI

(no grant #) (McCormick) 3/22/2013 – 3/21/2015
Daiichi-Sankyo Pharmaceuticals Contract $190,780 direct/yr 01
Preclinical Evaluation of signaling pathways involved in cancer malignancy
The major goals of this project are to determine how EMT affects MAPK and P13K pathways downstream of oncogenic Ras and to identify genes required for survival in epithelial and mesenchymal cells.
Role: PI

PAST

2P30 CA082103-14 (McCormick) 9/19/2012 -5/31/2017
NIH/NCI $4,602,452 Total direct/yrs 1-5
Cancer Center Support Grant
The Cancer Center Support Grant provides support for administration and infrastructure for the UCSF Helen Diller Family Comprehensive Cancer Center.
Role: PI (Grant assigned to Director of UCSF HDFCCC)

U54CA143836 (Liphardt) 9/29/09-7/31/14
UC Berkeley $84,638 direct/yr 1-3
Fundamental Mechanobiology of Tumor Progression
The major goals of this project are to evaluate potential therapeutic applications of the projects and addressing questions that of highest clinical impact
Role: Co-Investigator

(no grant #)(McCormick) 7/1/2010 - 6/30/2012
American Assn for Cancer Research $90,000 direct/yr 1-2
Specific K-Ras Inhibitors for treating pancreatic cancer
The major goal is to inhibit KRAS function by preventing modifications to the protein that are essential for its biological activity. Such compunds could lead to new drugs for treating pancreas cancer and other disease driven my mutant KRAS.
Role: PI

(no grant #)(McCormick) 4/1/2011 - 3/31/2013
Lustgarten Foundation (PI) $173,267 direct/yr 1-2
Developing Targeted Nanoparticles to Interfere with
K-ras Expression Using siRNA
The major goal of this project is to develop and utilize human antibody-targeted nanoparticles to deliver small interfering RNAs to pancreatic tumor cells to inhibit K-ras function.

American Assn for Cancer Research (PI) 7/1/2010-6/30/2012
Specific K-Ras Inhibitors for treating pancreatic cancer $180,000 direct/yr 1-2
The major goals of this project are to propose a new effort to target the C-terminus of K-Ras 4B, the major form of K-Ras expressed in pancreatic cancer cells, by identifying small molecules that bind to this region and covalently modify cysteine-186 to prevent lipid modification and block K-Ras 4B function in cancer cells.

P30 CA82103 McCormick (PI) 09/25/2007-05/31/2012
NIH/NCI $3,624,403 direct/yr 1
Cancer Center Support Grant $19,550,266 Total direct/yrs 1-5
The Cancer Center Support Grant provides support for administration and infrastructure for the UCSF Comprehensive Cancer Center. Dr. Frank McCormick is the Director of the Cancer Center.

BIO07-10642-IND (PI) 2/1/2008 - 1/31/2011

Halozyme Therapeutics, Inc. $97,220 direct/yr 1
Self-Amplifying Plasmids That Kill Cancer Cells $194,307 Total direct/yrs 1-2
The major goal of this project is to study a combination of tumor selective amplification and gene expression to facilitate efficient and specific killing of tumor cells.

P50 CA 112970 (Korn) (Co-Investigator) 1/1/2005 – 12/31/2010
NIH/NCI $268,853 direct/yr 1
UC/Lawrence Berkeley Lab Subcontract $1,461,856Total direct/yrs 1-5
The major goal of this program is to develop and experimentally validate a computational model of Raf-MEK-ERK signaling in breast cancer that will predict individual responses to therapeutic agents that inhibit Raf-MEK-ERK signaling.

BIO07-10642-UC (PI) 2/1/2008 - 1/31/2010
UC Discovery-Biotechnology $118,633 direct/yr 1
Self-Amplifying Plasmids That Kill Cancer Cells $243,576 Total direct/yrs 1-2
The major goal of this project is to study a combination of tumor selective amplification and gene expression to facilitate efficient and specific killing of tumor cells.

P50 CA58207 Gray (Co-Investigator) 08/1/2002 - 11/30/2007
NIH/NCI $694,138 direct/yr 8
Bay Area Breast Cancer Translational Research Program $8,000,050 Total direct/yrs 8-13
Project 2
Therapeutic Implications of Amplification of Receptor Tyrosine Kinase (RTK) Signaling Pathway Genes
In this program, we will attempt to understand the molecular basis of the variable response amongst breast cancer cells to targeted therapeutics, such as Herceptin and EGF-receptor inhibitors.

P30 CA82103 (PI) 08/05/1999 – 08/31/2007
NIH/NCI $852,117direct/yr 1
Cancer Center Support Grant $29,343,177 direct/yrs 1-8
The Cancer Center Support Grant provides support for administration and infrastructure for the UCSF Comprehensive Cancer Center. Dr. Frank McCormick is the Director of the Cancer Center.

Onyx Corp. (PI) 01/28/2003 – 01/27/2007
Replicating Viruses for Treating Cancer $349,999.56 direct/yr 1
$1,082,698.01Total Total direct/yrs 1-3
The research project shall consist of experiments aimed at identifying/construction novel replicating viruses and methods/compositions of using the same for treating cancer.

Daiichi Pharmaceuticals (PI) 07/01/2001 - 06/30/2004
Survival Pathways in Cancer Cells $1,048,385 direct/yr 1
$3,089,786 Total direct/yrs 1-3
This program seeks to identify new targets for therapeutic intervention, based on signal transduction pathways that promote cancer cell survival. In collaboration with Daiichi, we will screen for drugs that block these pathways selectively.

Biostar02-10242 (PI) 01/28/2003-01/27/2006
UC Discovery Grant $349,999.56 direct/yr 1
Replicating Viruses for Treating Cancer $1,082,698.01Total direct/yrs 1-3
The goal of this project is to use molecular analysis of cancer cells infected with ONYX-015 to devise and test new strategies for improving efficacy of this promising new anti-cancer agent.

DAMD17-03-1-0170 (PI) 05/01/2003-05/31/2006
DOD Idea Award $148,152 direct/yr 1

Identification of Functions of Neurofibromin Distinct from RasGAP Domain $442,793Total direct/yrs 1-3
The goals of this project are to establish a system for blocking signals detected by neurofibromin and Ira proteins using yeast as a model organism; and to identify the nature of the signals using genetic, biochemical and genomic approaches.

Biostar02-10331 Gray (Co-Investigator) 08/19/2003-08/18/2006
UC Discovery Grant $100,000 direct/yr 1
Validating Breast Cancer Therapeutic Targets $300,000 Total direct/yrs 1-3
The overall goal of this project is to identify and validate new therapeutic targets in breast cancer and to identify candidate therapeutic agents against these targets.

Pilot Studies Award (PI) 10/01/2003-09/30/2004
National Neurofibromatosis Foundation $25,000 direct/yr 1
A Screen for IRA/Neurofibromin Functions Distinct from the GAP Domain $25,000 Total direct/yr 1
Major goals: Saccharomyces cerevisiae has two neurofibromin homologs, Ira1 and Ira2, whose functions can be complemented by the human protein, and whose homology with neurofibromin extends across most of the protein, including sequences flanking the GAP domain. We propose to study the functions of these flanking sequences using the power of yeast genetics and expression arrays.

PEER REVIEWED PUBLICATIONS:

1. **McCormick, F.,** and Newton, A. A. 1975. Polyamine metabolism in cells infected with herpes simplex virus. *J Gen Virol* 27:25-33.
2. **McCormick, F.,** 1977. Polyamine metabolism in enucleated mouse L-cells. *J Cell Physiol* 93:285-92.
3. **McCormick, F.,** 1978. Kinetics of polyamine synthesis and turnover in mouse fibroblasts. *Biochem J* 174:427-34.
4. **McCormick, F.,** 1978. Polyamine turnover and leakage during infection of HeLa and L-cells with herpes simplex virus type 1. *Virology* 91:496-503.
5. Cohen, S. S., **McCormick, F.,** 1979. Polyamines and virus multiplication. *Adv Virus Res* **24:**331-87.
6. **McCormick, F.,** Chaudry, F., Harvey, R., Smith, R., Rigby, P. W., Paucha, E., and Smith, A. E. 1980. T antigens of SV40-transformed cells. *Cold Spring Harb Symp Quant Biol* 44:171-8.
7. **McCormick, F.,** and Harlow, E. 1980. Association of a murine 53,000-dalton phosphoprotein with simian virus 40 large-T antigen in transformed cells. *J Virol* 34:213-24.
8. Milner, J., and **McCormick, F.,** 1980. Lymphocyte stimulation: concanavalin A induces the expression of a 53K protein. *Cell Biol Int Rep* 4:663-7.
9. **McCormick, F.,** Clark, R., Harlow, E., and Tjian, R. 1981. SV40 T antigen binds specifically to a cellular 53 K protein in vitro. *Nature* 292:63-5.
10. **McCormick, F.,** Lane, D. P., and Dilworth, S. M. 1982. Immunological cross-reaction between large T-antigens of SV40 and polyoma virus. *Virology* 116:382-7.
11. **McCormick, F.,** Trahey, M., Innis, M., Dieckmann, B., and Ringold, G. 1984. Inducible expression of amplified human beta interferon genes in CHO cells. *Mol Cell Biol* 4:166-72.
12. Ringold, G. M., Dieckmann, B., Vannice, J. L., Trahey, M., and **McCormick, F.,** 1984. Inhibition of protein synthesis stimulates the transcription of human beta-interferon genes in Chinese hamster ovary cells. *Proc Natl Acad Sci U S A* 81:3964-8.

13. Clark, R., Wong, G., Arnheim, N., Nitecki, D., and **McCormick, F.,** 1985. Antibodies specific for amino acid 12 of the ras oncogene product inhibit GTP binding. *Proc Natl Acad Sci U S A* 82:5280-4.

14. Feramisco, J. R., Clark, R., Wong, G., Arnheim, N., Milley, R., and **McCormick, F.,** 1985. Transient reversion of ras oncogene-induced cell transformation by antibodies specific for amino acid 12 of ras protein. *Nature* 314:639-42.

15. **McCormick, F.,** Clark, B. F., la Cour, T. F., Kjeldgaard, M., Norskov-Lauritsen, L., and Nyborg, J. 1985. A model for the tertiary structure of p21, the product of the ras oncogene. *Science* 230:78-82.

16. Innis, M. A., and **McCormick, F.,** 1986. Procedures for expression, modification, and analysis of human fibroblast interferon (IFN-beta) genes in heterologous cells. *Methods Enzymol* 119:397-403.

17. **McCormick, F.,** Levenson, C., Cole, G., Innis, M., and Clark, R. 1986. Genetic and biochemical analysis of ras p21 structure. *Symp Fundam Cancer Res* 39:137-42.

18. Wong, G., Arnheim, N., Clark, R., McCabe, P., Innis, M., Aldwin, L., Nitecki, D., and **McCormick, F.,** 1986. Detection of activated Mr 21,000 protein, the product of ras oncogenes, using antibodies with specificity for amino acid 12. *Cancer Res* 46:6029-33.

19. Bar-Sagi, D., **McCormick, F.,** Milley, R. J., and Feramisco, J. R. 1987. Inhibition of cell surface ruffling and fluid-phase pinocytosis by microinjection of anti-ras antibodies into living cells. *J Cell Physiol Suppl* **Suppl:**69-73.

20. Korn, L. J., Siebel, C. W., **McCormick, F.,** and Roth, R. A. 1987. Ras p21 as a potential mediator of insulin action in Xenopus oocytes. *Science* 236:840-3.

21. Trahey, M., and **McCormick, F.,** 1987. A cytoplasmic protein stimulates normal N-ras p21 GTPase, but does not affect oncogenic mutants. *Science* 238:542-5.

22. Trahey, M., Milley, R. J., Cole, G. E., Innis, M., Paterson, H., Marshall, C. J., Hall, A., and **McCormick, F.,** 1987. Biochemical and biological properties of the human N-ras p21 protein. *Mol Cell Biol* 7:541-4.

23. Adari, H., Lowy, D. R., Willumsen, B. M., Der, C. J., and **McCormick, F.,** 1988. Guanosine triphosphatase activating protein (GAP) interacts with the p21 ras effector binding domain. *Science* 240:518-21.

24. Bar-Sagi, D., Suhan, J. P., **McCormick, F.,** and Feramisco, J. R. 1988. Localization of phospholipase A2 in normal and ras-transformed cells. *J Cell Biol* 106:1649-58.

25. Clark, R., Stampfer, M. R., Milley, R., O'Rourke, E., Walen, K. H., Kriegler, M., Kopplin, J., and **McCormick, F.,** 1988. Transformation of human mammary epithelial cells by oncogenic retroviruses. *Cancer Res* 48:4689-94.

26. Creasey, A. A., Vitt, C. R., Herst, C., O'Rourke, E., Doyle, L., Innis, M. A., McCabe, P. C., **McCormick, F.,** Milley, R., Lin, L. S., and et al. 1988. Functional properties of proteins coded by three human alpha-interferon genes and a pseudogene. *Cancer Res* 48:1763-70.

27. Farr, C. J., Saiki, R. K., Erlich, H. A., **McCormick, F.,** and Marshall, C. J. 1988. Analysis of RAS gene mutations in acute myeloid leukemia by polymerase chain reaction and oligonucleotide probes. *Proc Natl Acad Sci U S A* 85:1629-33.

28. Kawasaki, E. S., Clark, S. S., Coyne, M. Y., Smith, S. D., Champlin, R., Witte, O. N., and **McCormick, F.,** 1988. Diagnosis of chronic myeloid and acute lymphocytic leukemias by detection of leukemia-specific mRNA sequences amplified in vitro. *Proc Natl Acad Sci U S A* 85:5698-702.

29. **McCormick, F.,** Adari, H., Trahey, M., Halenbeck, R., Koths, K., Martin, G. A., Crosier, W. J., Watt, K., Rubinfeld, B., and Wong, G. 1988. Interaction of ras p21 proteins with GTPase activating protein. *Cold Spring Harb Symp Quant Biol* 53:849-54.

30. Neri, A., Knowles, D. M., Greco, A., **McCormick, F.,** and Dalla-Favera, R. 1988. Analysis of RAS oncogene mutations in human lymphoid malignancies. *Proc Natl Acad Sci U S A* 85:9268-72.

31. Padua, R. A., Carter, G., Hughes, D., Gow, J., Farr, C., Oscier, D., **McCormick, F.,** and Jacobs, A. 1988. RAS mutations in myelodysplasia detected by amplification, oligonucleotide hybridization, and transformation. *Leukemia* 2:503-10.

32. Trahey, M., Wong, G., Halenbeck, R., Rubinfeld, B., Martin, G. A., Ladner, M., Long, C. M., Crosier, W. J., Watt, K., Koths, K., and **McCormick, F.,** 1988. Molecular cloning of two types of GAP complementary DNA from human placenta. *Science* 242:1697-700.

33. Ballester, R., Michaeli, T., Ferguson, K., Xu, H. P., **McCormick, F.,** and Wigler, M. 1989. Genetic analysis of mammalian GAP expressed in yeast. *Cell* 59:681-6.

34. Burk, S. C., Papastavros, M. Z., **McCormick, F.,** and Redfield, A. G. 1989. Identification of resonances from an oncogenic activating locus of human N-RAS-encoded p21 protein using isotope-edited NMR. *Proc Natl Acad Sci U S A* 86:817-20.

35. Gumerlock, P. H., Meyers, F. J., Kokoris, S. P., Wong, G., **McCormick, F.,** P., and de Vere White, R. W. 1989. RAS enzyme-linked immunoblot assay discriminates p21 species: a technique to dissect gene family expression. *Anal Biochem* 180:158-68.

36. **McCormick, F.,** 1989. Gasp: not just another oncogene. *Nature* 340:678-9.

37. **McCormick, F.,** 1989. The polymerase chain reaction and cancer diagnosis. *Cancer Cells* 1:56-61.

38. **McCormick, F.,** 1989. ras GTPase activating protein: signal transmitter and signal terminator. *Cell* 56:5-8.

39. Meyers, F. J., Gumerlock, P. H., Kokoris, S. P., deVere White, R. W., and **McCormick, F.,** 1989. Human bladder and colon carcinomas contain activated ras p21. Specific detection of twelfth codon mutants. *Cancer* 63:2177-81.

40. Padua, R. A., Carter, G., Hughes, D., Gow, J., Farr, C., Oscier, D., **McCormick, F.,** and Jacobs, A. 1989. RAS mutations in preleukaemias. *Hamatol Bluttransfus* 32:250-4.

41. Pendergast, A. M., Clark, R., Kawasaki, E. S., **McCormick, F.,** and Witte, O. N. 1989. Baculovirus expression of functional P210 BCR-ABL oncogene product. *Oncogene* 4:759-66.

42. Shukla, V. K., Hughes, D. C., Hughes, L. E., **McCormick, F.,** and Padua, R. A. 1989. ras mutations in human melanotic lesions: K-ras activation is a frequent and early event in melanoma development. *Oncogene Res* 5:121-7.

43. Sommers, C. L., Walker-Jones, D., Heckford, S. E., Worland, P., Valverius, E., Clark, R., **McCormick, F.,** Stampfer, M., Abularach, S., and Gelmann, E. P. 1989. Vimentin rather than keratin expression in some hormone-independent breast cancer cell lines and in oncogene-transformed mammary epithelial cells. *Cancer Res* 49:4258-63.

44. Valverius, E. M., Bates, S. E., Stampfer, M. R., Clark, R., **McCormick, F.,** Salomon, D. S., Lippman, M. E., and Dickson, R. B. 1989. Transforming growth factor alpha production and epidermal growth factor receptor expression in normal and oncogene transformed human mammary epithelial cells. *Mol Endocrinol* 3:203-14.

45. Valverius, E. M., Walker-Jones, D., Bates, S. E., Stampfer, M. R., Clark, R., **McCormick, F.,** Dickson, R. B., and Lippman, M. E. 1989. Production of and responsiveness to transforming

growth factor-beta in normal and oncogene-transformed human mammary epithelial cells. *Cancer Res* 49:6269-74.

46. Bourne, H. R., Sanders, D. A., and **McCormick, F.,** 1990. The GTPase superfamily: a conserved switch for diverse cell functions. *Nature* 348:125-32.

47. Carter, G., Hughes, D. C., Clark, R. E., **McCormick, F.,** Jacobs, A., Whittaker, J. A., and Padua, R. A. 1990. RAS mutations in patients following cytotoxic therapy for lymphoma. *Oncogene* 5:411-6.

48. Ellis, C., Moran, M., **McCormick, F.,** and Pawson, T. 1990. Phosphorylation of GAP and GAP-associated proteins by transforming and mitogenic tyrosine kinases. *Nature* 343:377-81.

49. Frech, M., John, J., Pizon, V., Chardin, P., Tavitian, A., Clark, R., **McCormick, F.,** and Wittinghofer, A. 1990. Inhibition of GTPase activating protein stimulation of Ras-p21 GTPase by the Krev-1 gene product. *Science* 249:169-71.

50. Halenbeck, R., Crosier, W. J., Clark, R., **McCormick, F.,** and Koths, K. 1990. Purification, characterization, and western blot analysis of human GTPase-activating protein from native and recombinant sources. *J Biol Chem* 265:21922-8.

51. Kaplan, D. R., Morrison, D. K., Wong, G., **McCormick, F.,** and Williams, L. T. 1990. PDGF beta-receptor stimulates tyrosine phosphorylation of GAP and association of GAP with a signaling complex. *Cell* 61:125-33.

52. Landis, C. A., Harsh, G., Lyons, J., Davis, R. L., **McCormick, F.,** and Bourne, H. R. 1990. Clinical characteristics of acromegalic patients whose pituitary tumors contain mutant Gs protein. *J Clin Endocrinol Metab* 71:1416-20.

53. Lemons, R. S., Espinosa, R. d., Rebentisch, M., **McCormick, F.,** Ladner, M., and Le Beau, M. M. 1990. Chromosomal localization of the gene encoding GTPase-activating protein (RASA) to human chromosome 5, bands q13-q15. *Genomics* 6:383-5.

54. Lubbert, M., Jonas, D., Miller, C. W., Herrmann, F., Mertelsmann, R., **McCormick, F.,** and Koeffler, H. P. 1990. Retrospective analysis of ras gene activation in myeloid leukemic cells. *Oncogene* 5:583-7.

55. Lubbert, M., Mirro, J., Jr., Miller, C. W., Kahan, J., Isaac, G., Kitchingman, G., Mertelsmann, R., Herrmann, F., **McCormick, F.,** and Koeffler, H. P. 1990. N-ras gene point mutations in childhood acute lymphocytic leukemia correlate with a poor prognosis. *Blood* 75:1163-9.

56. Lyons, J., Landis, C. A., Harsh, G., Vallar, L., Grunewald, K., Feichtinger, H., Duh, Q. Y., Clark, O. H., Kawasaki, E., Bourne, H. R., and **McCormick, F.,** 1990. Two G protein oncogenes in human endocrine tumors. *Science* 249:655-9.

57. Martin, G. A., Viskochil, D., Bollag, G., McCabe, P. C., Crosier, W. J., Haubruck, H., Conroy, L., Clark, R., O'Connell, P., Cawthon, R. M., and **McCormick, F.,** 1990. The GAP-related domain of the neurofibromatosis type 1 gene product interacts with ras p21. *Cell* 63:843-9.

58. **McCormick, F.,** 1990. GAP as ras effector or negative regulator? *Mol Carcinog* 3:185-7.

59. **McCormick, F.,** 1990. GTP binding and growth control. *Curr Opin Cell Biol* 2:181-4.

60. **McCormick, F.,** 1990. The world according to GAP. *Oncogene* 5:1281-3.

61. Munemitsu, S., Innis, M. A., Clark, R., **McCormick, F.,** Ullrich, A., and Polakis, P. 1990. Molecular cloning and expression of a G25K cDNA, the human homolog of the yeast cell cycle gene CDC42. *Mol Cell Biol* 10:5977-82.

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