Stanford



# Chris Cartwright, MD

Professor of Medicine (Gastroenterology and Hepatology), Emerita

Medicine - Med/Gastroenterology and Hepatology

NIH Biosketch available Online

### CONTACT INFORMATION


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## Bio

### BIO

Dr Cartwright is a Professor of Medicine and Gastroenterology with tenure at Stanford University. She trained at the University of California San Diego and the Salk Institute for Biological Studies before joining the Stanford Faculty in 1989. Her research in cancer biology focuses on understanding how normal intestinal cells regulate their growth and how loss of that regulation results in malignant transformation. She is an author on numerous scientific publications. Her research has been supported by grants from the National Institutes of Health (for 30 years), the American Cancer Society, the Broad Medical Research Foundation and the Crohn's and Colitis Foundation of America. She has served on NIH and American Cancer Society Study Sections and on the Editorial Board of the Gastrointestinal and Liver Physiology section of the American Journal of Physiology. In 1995 she was inducted into the American Society for Clinical Investigation. In 2008 she received an Outstanding Woman in Science Award from the American Gastroenterological Association (AGA) for her contributions to GI research. She has been an invited speaker, organizer and chairperson for numerous national AGA symposia on the molecular biology of gastrointestinal cancers.

Dr Cartwright's clinical interests focus on caring for those with inflammatory bowel diseases. She has cared for nearly 5,000 IBD patients over the past 3 decades. She served as Director of the Program for Inflammatory Bowel Diseases at Stanford University (1989-2007). She also served on the Editorial Board of the Inflammatory Bowel Diseases Journal and on the National Scientific Advisory Committee (Clinical Affairs/Professional Education) of the Crohn's and Colitis Foundation of America. In 2000 she received the Premier Physician Award from the Crohn's & Colitis Foundation of America Greater Bay Area Chapter. She has been an invited speaker, organizer and chairperson for numerous IBD symposia in northern California. In 2020 she was nominated for the Master Clinician Award in the Department of Medicine, and in 2021 she was nominated for the Physician of the Year Award, Stanford University School of Medicine.

### ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Medicine - Med/Gastroenterology and Hepatology
- Member, Stanford Cancer Institute

### ADMINISTRATIVE APPOINTMENTS

- Director, Program for Inflammatory Bowel Diseases, Stanford University School of Medicine, (1989-2007)

### HONORS AND AWARDS

- Elected Member, American Society for Clinical Investigation (1995 - present)
- Outstanding AGA Woman in Science Award, American Gastroenterological Association (2008)
- Premier Physician Award, Crohn's & Colitis Foundation of America - Greater Bay Area Chapter (2000)
- Honoree, Inflammatory Bowel Diseases Symposium, Stanford University School of Medicine (2015)
- Health Care Honorary Award: Patient Satisfaction Scores > 90th %ile of physicians ranked nationally, Stanford University School of Medicine (2017 - present)
- Nominee, Master Clinician Award, Department of Medicine, Stanford University School of Medicine (2020)
- Nominee, Physician of the Year Award, Stanford University School of Medicine (2021)

### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Tumor Biochemistry/Endocrinology Study Section, American Cancer Society (1995 - 1999)
- Member (Ad Hoc), General Medicine A-2 Study Section, National Institutes of Health (1998 - 1998)
- Member, Gastrointestinal Cell / Molecular Biology Study Section, National Institutes of Health (2007 - 2009)
- Editorial Board, American Journal of Physiology: Gastrointestinal and Liver Physiology (1997 - 2000)
- Editorial Board, Inflammatory Bowel Diseases Journal (1994 - 2006)
- Member, National Scientific Advisory Committee, Clinical Affairs/Professional Education, Crohn's and Colitis Foundation of America (1994 - 1997)
- Co-Director, Medical Advisory Committee, Crohn's & Colitis Foundation of America, Greater Bay Area Chapter (1991 - 1997)
- Member, Board of Trustees / Executive Committee, Crohn's & Colitis Foundation of America, Greater Bay Area Chapter (1991 - 1999)
- Medical Advisory Board, Crohn's & Colitis Foundation of America, Greater Bay Area Chapter (1999 - 2001)

### PROFESSIONAL EDUCATION

- BS, Stanford University , Biology (1973)
- MD, University of Utah , Medicine (1978)
- Research Associate, The Salk Institute , Cancer Biology (1989)

### COMMUNITY AND INTERNATIONAL WORK

- Education on Inflammatory Bowel Diseases, San Francisco Bay Area
- Inflammatory Bowel Diseases

## Research & Scholarship

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research in my laboratory focuses on molecular mechanisms of intestinal cell growth control. A primary focus is on function and regulation of the Src family of tyrosine kinases in normal cells, and their deregulation in cancer cells. Molecular, cellular and physiologic approaches are used to explore basic questions about growth regulation. Areas of active investigation include studies of Src function in cell cycle progression, proliferation, differentiation, adhesion, survival and malignant transformation; discovery of endogenous inhibitors of Src kinases; analysis of inhibitor function in cell growth control and apoptosis; and exploration of new drug therapy for colon cancer. Our recent discovery of a Src inhibitor, RACK1, which works both to inhibit growth (by suppressing Src activity at G1 and mitotic checkpoints) and to induce death of colon cells, could be exploited for development of new and more powerful and selective strategies for treatment of human colon cancer.

# Teaching

## GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (PhD Program)
- Gastroenterology & Hepatology (Fellowship Program)

# Publications

## PUBLICATIONS

- **Rack1 maintains intestinal homeostasis by protecting the integrity of the epithelial barrier** *AMERICAN JOURNAL OF PHYSIOLOGY-GASTROINTESTINAL AND LIVER PHYSIOLOGY*
  Cheng, Z., Cartwright, C. A.
  2018; 314 (2): G263–G274
- **Rack1 function in intestinal epithelia: regulating crypt cell proliferation and regeneration and promoting differentiation and apoptosis** *AMERICAN JOURNAL OF PHYSIOLOGY-GASTROINTESTINAL AND LIVER PHYSIOLOGY*
  Cheng, Z., Pai, R. K., Cartwright, C. A.
  2018; 314 (1): G1–G13
- **Pulmonary Crohn's Disease** *DIGESTIVE DISEASES AND SCIENCES*
  Regalia, K., Shelton, A., Berry, G., Triadafilopoulos, G., Cartwright, C. A.
  2017; 62 (1): 64-67
- **Intestinal Enteroendocrine Lineage Cells Possess Homeostatic and Injury-Inducible Stem Cell Activity** *Cell Stem Cell*
  Yan, K., Gevaert, O., Zheng, G., Anchang, B., Probert, C., et al
  2017; 21 (1): 78 - 90.e6
- **Rack1 promotes epithelial cell-cell adhesion by regulating E-cadherin endocytosis** *ONCOGENE*
  Swaminathan, G., Cartwright, C. A.
  2012; 31 (3): 376-389
- **Relapse of Intestinal and Hepatic Amebiasis After Treatment** *DIGESTIVE DISEASES AND SCIENCES*
  Hwang, E. W., Cheung, L., Mojtahed, A., Cartwright, C. A.
  2011; 56 (3): 677-680
- **Characterization of In Vivo Keratin 19 Phosphorylation on Tyrosine-391** *PLOS ONE*
  Zhou, Q., Snider, N. T., Liao, J., Li, D. H., Hong, A., Ku, N., Cartwright, C. A., Omary, M. B.
  2010; 5 (10)
- **Distal Extrahepatic Cholangiocarcinoma Presenting as Cholangitis** *DIGESTIVE DISEASES AND SCIENCES*
  Lee, M., Banerjee, S., Posner, M. C., Cartwright, C. A.
  2010; 55 (7): 1852-1855
- **A novel pro-apoptotic function of RACK1: suppression of Src activity in the intrinsic and Akt pathways** *ONCOGENE*
  Mamidipudi, V., Cartwright, C. A.
  2009; 28 (50): 4421-4433
- **Crohn's Colitis Complicated by Cytomegalovirus Infection** *DIGESTIVE DISEASES AND SCIENCES*
  Levesque, B. G., Pai, R., Cartwright, C. A.
  2009; 54 (9): 1864-1867
- **RACK1 inhibits colonic cell growth by regulating Src activity at cell cycle checkpoints** *ONCOGENE*
  Mamidipudi, V., Dhillon, N. K., Parman, T., Miller, L. D., Lee, K. C., Cartwright, C. A.
  2007; 26 (20): 2914-2924
- **Peptide modulators of Src activity in G(1) regulate entry into S phase and proliferation of NIH 3T3 cells** *BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS*
  Mamidipudi, V., Miller, L. D., Mochly-Rosen, D., Cartwright, C. A.

2007; 352 (2): 423-430

- **Human colon cancer cells lack mutations in RACK1, a suppressor of oncogenic Src tyrosine kinases** *71st Annual Scientific Meeting of the American-College-of-Gasroenterology*
  Levesque, B. G., Lee, K. C., Cartwright, C. A.
  NATURE PUBLISHING GROUP.2006: S198–S198
- **RACK1 regulates G(1)/S progression by suppressing Src kinase activity** *MOLECULAR AND CELLULAR BIOLOGY*
  Mamidipudi, V., Zhang, J., Lee, K. C., Cartwright, C. A.
  2004; 24 (15): 6788-6798
- **RACK1 regulates Src-mediated Sam68 and p190RhoGAP signaling** *ONCOGENE*
  Miller, L. D., Lee, K. C., Mochly-Rosen, D., Cartwright, C. A.
  2004; 23 (33): 5682-5686
- **RACK1 inhibits the serum- and anchorage-independent growth of v-Src transformed cells** *FEBS LETTERS*
  Mamidipudi, V., Chang, B. Y., Harte, R. A., Lee, K. C., Cartwright, C. A.
  2004; 567 (2-3): 321-326
- **Cytomegalovirus infection in steroid-refractory ulcerative colitis - A case-control study** *AMERICAN JOURNAL OF SURGICAL PATHOLOGY*
  Kambham, N., Vij, R., Cartwright, C. A., Longacre, T.
  2004; 28 (3): 365-373
- **Detection of protein kinase-binding partners by the yeast two-hybrid analysis.** *Methods in molecular biology (Clifton, N.J.)*
  Chang, B. Y., Cartwright, C. A.
  2003; 233: 327-343
- **RACK1: a novel substrate for the Src protein-tyrosine kinase** *ONCOGENE*
  Chang, B. Y., Harte, R. A., Cartwright, C. A.
  2002; 21 (50): 7619-7629
- **The interaction of Src and RACK1 is enhanced by activation of protein kinase C and tyrosine phosphorylation of RACK1** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Chang, B. Y., Chiang, M. L., Cartwright, C. A.
  2001; 276 (23): 20346-20356
- **The Shp-2 tyrosine phosphatase activates the Src tyrosine kinase by a non-enzymatic mechanism** *ONCOGENE*
  Walter, A. O., Peng, Z. Y., Cartwright, C. A.
  1999; 18 (11): 1911-1920
- **RACK1, a receptor for activated C kinase and a homolog of the beta subunit of G proteins, inhibits activity of Src tyrosine kinases and growth of NIH 3T3 cells** *MOLECULAR AND CELLULAR BIOLOGY*
  Chang, B. Y., Conroy, K. B., Machleder, E. M., Cartwright, C. A.
  1998; 18 (6): 3245-3256
- **Intestinal cell growth control: Role of src tyrosine kinases** *GASTROENTEROLOGY*
  Cartwright, C.
  1998; 114 (6): 1335-1338
- **Src activation in malignant and premalignant epithelia of Barrett's esophagus** *GASTROENTEROLOGY*
  KUMBLE, S., Omary, M. B., Cartwright, C. A., Triadafilopoulos, G.
  1997; 112 (2): 348-356
- **REGULATION OF THE SRC TYROSINE KINASE AND SYP TYROSINE PHOSPHATASE BY THEIR CELLULAR-ASSOCIATION** *ONCOGENE*
  Peng, Z. Y., Cartwright, C. A.
  1995; 11 (10): 1955-1962
- **SRC ACTIVITY INCREASES AND YES ACTIVITY DECREASES DURING MITOSIS OF HUMAN COLON-CARCINOMA CELLS** *MOLECULAR AND CELLULAR BIOLOGY*
  Park, J., Cartwright, C. A.
  1995; 15 (5): 2374-2382

- **ELEVATED C-YES TYROSINE KINASE-ACTIVITY IN PREMALIGNANT LESIONS OF THE COLON** *GASTROENTEROLOGY*
  PENA, S. V., Melhem, M. F., Meisler, A. I., Cartwright, C. A.
  1995; 108 (1): 117-124

- **ELEVATED C-SRC TYROSINE KINASE-ACTIVITY IN PREMALIGNANT EPITHELIA OF ULCERATIVE-COLITIS** *JOURNAL OF CLINICAL INVESTIGATION*
  Cartwright, C. A., COAD, C. A., Egbert, B. M.
  1994; 93 (2): 509-515

- **C-YES TYROSINE KINASE-ACTIVITY IN HUMAN COLON-CARCINOMA** *ONCOGENE*
  Park, J. S., Meisler, A. I., Cartwright, C. A.
  1993; 8 (10): 2627-2635

- **INTESTINAL CRYPT CELLS CONTAIN HIGHER LEVELS OF CYTOSKELETAL-ASSOCIATED PP60C-SRC PROTEIN TYROSINE KINASE-ACTIVITY THAN DO DIFFERENTIATED ENTEROCYTES** *ONCOGENE*
  Cartwright, C. A., MAMAJIWALLA, S., SKOLNICK, S. A., Eckhart, W., Burgess, D. R.
  1993; 8 (4): 1033-1039

- **GENE STRUCTURE AND EXPRESSION IN COLORECTAL-CANCER** *UNDERLYING MOLECULAR, CELLULAR, AND IMMUNOLOGICAL FACTORS IN CANCER AND AGING*
  Pipas, J. M., POGUEGEILE, K., Finley, G. G., Cartwright, C. A., MEIESLER, A. I.
  1993; 330: 67-75

- **THE HEPATITIS-B VIRUS-ENCODED TRANSCRIPTIONAL TRANSACTIVATOR HBX APPEARS TO BE A NOVEL PROTEIN SERINE THREONINE KINASE** *CELL*
  Wu, J. Y., Zhou, Z. Y., Judd, A., Cartwright, C. A., Robinson, W. S.
  1990; 63 (4): 687-695

- **A DNA REPLICATION-POSITIVE MUTANT OF SIMIAN VIRUS-40 THAT IS DEFECTIVE FOR TRANSFORMATION AND THE PRODUCTION OF INFECTIOUS VIRIONS** *JOURNAL OF VIROLOGY*
  Peden, K. W., Spence, S. L., Tack, L. C., Cartwright, C. A., Srinivasan, A., Pipas, J. M.
  1990; 64 (6): 2912-2921

- **ACTIVATION OF THE PP60C-SRC PROTEIN-KINASE IS AN EARLY EVENT IN COLONIC CARCINOGENESIS** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Cartwright, C. A., Meisler, A. I., Eckhart, W.
  1990; 87 (2): 558-562

- **EARLY ACTIVATION OF ENDOGENOUS PP60SRC KINASE-ACTIVITY DURING NEURONAL DIFFERENTIATION OF CULTURED HUMAN NEUROBLASTOMA-CELLS** *MOLECULAR AND CELLULAR BIOLOGY*
  Bjelfman, C., MEYERSON, G., Cartwright, C. A., Mellstrom, K., Hammerling, U., Pahlman, S.
  1990; 10 (1): 361-370

- **PROPERTIES OF A SIMIAN-VIRUS 40 MUTANT-T ANTIGEN SUBSTITUTED IN THE HYDROPHOBIC REGION - DEFECTIVE ATPASE AND OLIGOMERIZATION ACTIVITIES AND ALTERED PHOSPHORYLATION ACCOMPANY AN INABILITY TO COMPLEX WITH CELLULAR P53** *JOURNAL OF VIROLOGY*
  Tack, L. C., Cartwright, C. A., Wright, J. H., Eckhart, W., Peden, K. W., Srinivasan, A., Pipas, J. M.
  1989; 63 (8): 3362-3367

- **PP60C-SRC ACTIVATION IN HUMAN-COLON CARCINOMA** *JOURNAL OF CLINICAL INVESTIGATION*
  Cartwright, C. A., Kamps, M. P., Meisler, A. I., Pipas, J. M., Eckhart, W.
  1989; 83 (6): 2025-2033

- **PP60C-SRC EXPRESSION IN THE DEVELOPING RAT-BRAIN** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Cartwright, C. A., Simantov, R., Cowan, W. M., Hunter, T., Eckhart, W.
  1988; 85 (10): 3348-3352

- **ALTERATIONS IN PP60C-SRC ACCOMPANY DIFFERENTIATION OF NEURONS FROM RAT EMBRYO STRIATUM** *MOLECULAR AND CELLULAR BIOLOGY*
  Cartwright, C. A., Simantov, R., Kaplan, P. L., Hunter, T., Eckhart, W.

1987; 7 (5): 1830-1840

- **CDNA CLONING WITH A RETROVIRUS EXPRESSION VECTOR - GENERATION OF A PP60C-SRC CDNA CLONE** *JOURNAL OF VIROLOGY*
  Kaplan, P. L., Simon, S., Cartwright, C. A., Eckhart, W.
  1987; 61 (5): 1731-1734
- **CELL-TRANSFORMATION BY PP60C-SRC MUTATED IN THE CARBOXY-TERMINAL REGULATORY DOMAIN** *CELL*
  Cartwright, C. A., Eckhart, W., Simon, S., Kaplan, P. L.
  1987; 49 (1): 83-91
- **INHIBITION OF ATP LEVELS BY QUINIDINE IN A HUMAN COLONIC EPITHELIAL-CELL LINE** *AMERICAN JOURNAL OF PHYSIOLOGY*
  DHARMSATHAPHORN, K., HUOTT, P., Cartwright, C. A., McRoberts, J. A., Mandel, K. G., Beuerlein, G.
  1986; 250 (6): G806-G813
- **ALTERED SITES OF TYROSINE PHOSPHORYLATION IN PP60C-SRC ASSOCIATED WITH POLYOMAVIRUS MIDDLE TUMOR-ANTIGEN** *MOLECULAR AND CELLULAR BIOLOGY*
  Cartwright, C. A., Kaplan, P. L., Cooper, J. A., Hunter, T., Eckhart, W.
  1986; 6 (5): 1562-1570
- **TYR527 IS PHOSPHORYLATED IN PP60C-SRC - IMPLICATIONS FOR REGULATION** *SCIENCE*
  Cooper, J. A., Gould, K. L., Cartwright, C. A., Hunter, T.
  1986; 231 (4744): 1431-1434
- **STRUCTURAL AND FUNCTIONAL MODIFICATION OF PP60C-SRC ASSOCIATED WITH POLYOMA MIDDLE TUMOR-ANTIGEN FROM INFECTED OR TRANSFORMED-CELLS** *MOLECULAR AND CELLULAR BIOLOGY*
  Cartwright, C. A., HUTCHINSON, M. A., Eckhart, W.
  1985; 5 (10): 2647-2652
- **SYNERGISTIC ACTION OF CYCLIC ADENOSINE MONOPHOSPHATE-MEDIATED AND CALCIUM-MEDIATED CHLORIDE SECRETION IN A COLONIC EPITHELIAL-CELL LINE** *JOURNAL OF CLINICAL INVESTIGATION*
  Cartwright, C. A., McRoberts, J. A., Mandel, K. G., DHARMSATHAPHORN, K.
  1985; 76 (5): 1837-1842
- **Electrolyte transport in a human colonic cell line: regulation by cAMP and calcium.** *Kroc Foundation series*
  Cartwright, C. A., McRoberts, J. A., Mandel, K. G., Masui, H., DHARMSATHAPHORN, K.
  1984; 17: 65-75
- **PELIOSIS HEPATIS - DIAGNOSIS BY MAGNIFICATION WEDGED HEPATIC VENOGRAPHY** *RADIOLOGY*
  Lyon, J., Bookstein, J. J., Cartwright, C. A., Romano, A., HEENEY, D. J.
  1984; 150 (3): 647-649
- **MANAGEMENT OF ACUTE DIARRHEA** *JOURNAL OF CLINICAL GASTROENTEROLOGY*
  Gertler, S., Pressman, J., Cartwright, C., DHARMSATHAPHORN, K.
  1983; 5 (6): 523-534
- **INNOMINATE VEIN OBSTRUCTION CAUSED BY INTRA-THORACIC GOITER** *WESTERN JOURNAL OF MEDICINE*
  Tolle, S. W., Cartwright, C. A., Parthemore, J. G.
  1981; 135 (3): 235-238
- **EFFECT OF MORPHINE ON SEROTONIN RELEASE FROM MYENTERIC PLEXUS OF GUINEA-PIG** *JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS*
  Schulz, R., Cartwright, C.
  1974; 190 (3): 420-430
- **REVERSIBILITY OF MORPHINE-TOLERANCE AND DEPENDENCE IN GUINEA-PIG BRAIN AND MYENTERIC PLEXUS** *NATURE*
  Schulz, R., CARTWRIG, C., GOLDSTEI, A.
  1974; 251 (5473): 329-331