

CURRICULUM VITAE

John Paul Fruehauf, M.D., Ph.D.

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Education and Training

1973–1977 **University of California, Santa Barbara**
B.A.: Cellular and Organismal Biology
B.A.: Psychology

1978–1985 **Rush University** M.D., Ph.D.: Pharmacology

1985–1987 **University of California, Irvine**
Internal Medicine Residency

1987–1992 **National Cancer Institute**, Bethesda, MD
Clinical Oncology Program Medical Staff Fellow
Research Officers Group, Commissioned Corps, PHS
Biotechnology Fellow

Professional Positions

1993–2000 Assistant Clinical Professor, U.C. Irvine
2003–2013 Associate Professor of Clinical Medicine,
Biological Chemistry, Pharmaceutical Sciences
and Biomedical Engineering

July 2014-present Professor of Clinical Medicine,
Biological Chemistry, Pharmaceutical Sciences
and Biomedical Engineering

2004-present Director, Clinical Pharmacology and Developmental Therapeutics
Chao Family Comprehensive Cancer Research Center
University of California, Irvine

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Work Experience

Oncotech, Inc.

1992-1998	Vice President and Medical Director
1998-2002	Senior Vice President and Medical Director
2002-2004	Chief Scientific Officer

Licensure

	Year
California CA G58826	1986
Maryland D006157	1987

Certifications

American Board of Internal Medicine, Medical Oncology #124351, Recertified 2011

Memberships and Societies

American Association for Cancer Research	1988–Present
American Society of Clinical Oncology	1996–Present
SWOG, Melanoma Committee	1998–Present

Awards and Honors

Consumers Research Council of America Award for Top Oncologist	2007
OCMA Physician of Excellence	2010, 2014, 2016
U.S. News Top Doctor	2011
Teacher of the Year UCI Oncology Fellows	2011

Research Experience

1993-present UC Irvine

My group has focused on mechanisms of drug action and resistance with the goal of developing predictive tests that improve therapeutic outcomes for cancer patients. Active areas in my laboratory at UC Irvine include the role of glutathione and redox mechanisms in drug resistance, development of vascular endothelial cell models to predict response to antiangiogenesis agents, and the examination of differential gene expression that can distinguish between drug resistant and drug sensitive tumors. More recently we have focused on translating our bench work to the bedside through the development of clinical trials that include correlative laboratory studies.

Discovery of agents that inhibit formation of tumor blood vessels continues to be an active area of therapeutic development. Insights into the immunomodulatory activity of antiangiogenesis agents has led to their effective combination with check point inhibitors (UCI 16-63). However, resistance to antiangiogenesis agents as a deterrent to the success of this approach has been overlooked. In order to define the role of angiogenesis in tumor progression, and to develop models that might predict treatment response, my group developed an angiogenesis index based on mutant p53, the angiogenesis suppressor thrombospondin-1 (TSP1), and intratumor

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microvessel counts (US Patent # 5,840,507). We applied this marker set to ovarian cancer patients receiving bevacizumab on a GOG clinical trial, finding that TSP1 expression was significantly associated with durability of response to Avastin (Gynecol Oncol 119:484-90, 2010).

Our group has also explored the relationship between tumor class, drug response and differential gene and protein expression (Clinical Cancer Res 5 (Suppl), #476, 1999). One significant deficiency in current molecular approaches to cancer genomics is specimen purity. The complex mixture of cells within a tumor makes it difficult to delineate which mRNA species are cancer cell specific. We therefore developed flow-cytometry methods to selectively separate malignant cells and tumor derived vascular endothelial cells (VEC) from their stromal background tissue. Transcript levels were determined for the purified cancer cell and VEC cell populations using Affymetrix U133 A and B gene arrays containing 30,000 distinct genes and EST's. Differential gene expression patterns that classify endothelial cells into drug resistance categories have been identified (Proc Am Assoc Cancer Res 43: #4502, 2002; Breast Cancer Res and Treat 76: #562, 2002; Proc Am Assoc Cancer Res 2003, #3998 (Minisymposium Podium Presentation).

My current position as Director of Clinical Pharmacology and Developmental Therapeutics in the Chao Family Comprehensive Cancer Center at UC Irvine allows me to take a translational approach to predictive oncology and to apply bioprofiling to patients on clinical trials. The tremendous complexity of aberrant pathways in cancer has been a major deterrent in the development of targeted therapeutics. With the advent of gene arrays and advanced mass spectrometry methods, this complexity may finally be captured. The capability to bioprofile the unique proteogenomic characteristics of an individual patient's tumor is at hand. Co-development of proteogenomic "theragnostic" tests in conjunction with clinical trials of targeted agents are helping to define patient subsets most likely to benefit, while excluding patients with inappropriate biomarker profiles from potentially toxic treatment. The convergence of biotechnology, molecular biology and clinical pharmacology with bioinformatics should enable a rational approach to target cancer related pathways and improve outcomes for patients with cancer.

Research Background

- 1987-1993 National Cancer Institute, NIH, Clin Pharm Branch
Examined the mechanisms of cross resistance between chemotherapy and tumor necrosis factor in breast cancer and prostate cancer cell lines.
- 1978-1985 Rush University, Department of Pharmacology
Determined a novel mechanism of action of BCNU to inhibit DNA synthesis via glutathione depletion in conjunction with inhibition of glutathione recycling. (PhD Thesis)
- 1975-1977 University of California, Santa Barbara, Dpt. Of Chemistry
Worked on the isolation of the red blood cell glucose transporter using 3-deoxy-3-fluoro-glucose.

Active Research Grant and Contract Support

Current Peer Reviewed Awards

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01/31/19–01/31/24 NIH/NCI P30, CA-62203-14
UCI Cancer Center Support Grant. Center Grant to support UCI Cancer Center.
Role: Chair, Data Safety Monitoring Board

Company Sponsored Laboratory Research Awards

1/18-12/14/21 Astellas
Topotecan Reversal of Enzalutamide Resistance in 22Rv1 Cells via Blockade of AR-V7
Nuclear Translocation
Role: PI
\$172,154.00

Recently Completed Peer Reviewed Support

01/01/11–12/31/16 NIH/NCI R21, CA156032-02
Novel biologic markers of treatment resistance in locally advanced cervical carcinoma.
Role: CO-PI
\$150,000 (T)

6/13-5/18 NIH/NCI RO1
PAK Kinases Regulate Melanoma Chemoresistance and Metastasis
Role: Co-I (PI Anand Ganesan)
\$1,210,649 (T)

6/13-5/18 NIH/NCI RO1
PAK Kinases Regulate Melanoma Chemoresistance and Metastasis
Role: Co-I (PI Anand Ganesan)
\$1,210,649 (T)

Current Clinical Trials Funding

Industry Sponsored Trial/ UCI-18-64 : RPL-001-16 An Open-Label, Multicenter, Phase 1/2 Study of RP1 as a Single Agent and in Combination with PD1 Blockade in Patients with Solid Tumors.
PI 7/15/21-

Industry Sponsored Trial/ UCI-20-57: A Phase 3, Randomized, Open-label Study to Compare Adjuvant Immunotherapy of Bempegaldesleukin Combined with Nivolumab Versus Nivolumab After Complete Resection of Melanoma in Patients at High Risk for Recurrence (PIVOT-12).
PI \$593,944 (T) 11/01/2020 - 10/31/2023

Industry Sponsored Trial/ UCI-19-140: A Randomized Phase II, Open-label, Active-controlled, Multicenter Study Investigating the Efficacy and Safety of UV1 Vaccination in Combination with Nivolumab and Ipilimumab as First-line Treatment of Patients with Unresectable or Metastatic Melanoma (UV1-202).
PI \$338,316 (T) 09/01/2020 - 08/31/2023

Industry Sponsored Trial/ UCI-20-116: A RANDOMIZED, CONTROLLED, OPEN-LABEL, PHASE 2 STUDY OF CEMIPIMAB AS A SINGLE AGENT AND IN COMBINATION WITH RP1 IN PATIENTS WITH ADVANCED CUTANEOUS SQUAMOUS CELL CARCINOMA.
PI \$493,338 (T) 11/01/2020 - 10/31/2023

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Industry Sponsored Trial/ UCI-19-15 A Phase 2, Open-Label, Randomized, Multicenter Trial of Encorafenib + Binimetinib Evaluating a Standard-dose and a High-dose Regimen in Patients With BRAFV600-Mutant Melanoma Brain Metastasis
PI \$299,658 (T) 11/5/19-10/21/22

Industry Sponsored Trial/ UCI-17-73: A Sequential 2-arm, Open-label Phase 1 Study to Evaluate the Effects of Encorafenib in Combination with Binimetinib on the Pharmacokinetics of Losartan, Midazolam, Caffeine, Omeprazole, and Dextromethorphan Administered in a Cocktail Approach and on the Pharmacokinetics of Rosuvastatin in Patients with BRAF V600-mutant Unresectable or Metastatic Melanoma or Other Advanced Solid Tumors.
PI \$171,895.00 (T) 1/24/18 – 10/21/22

Industry Sponsored Trial/ UCI-16-102: A PHASE III, OPEN-LABEL, MULTICENTER, TWO-ARM, RANDOMIZED STUDY TO INVESTIGATE THE EFFICACY AND SAFETY OF COBIMETINIB PLUS ATEZOLIZUMAB VERSUS PEMBROLIZUMAB IN PATIENTS WITH PREVIOUSLY UNTREATED ADVANCED BRAFV600 WILD-TYPE MELANOMA
PI \$378,399.00 (T). 11/15/17 - 11/14/20

Industry Sponsored Trial/ UCI 17-09: A randomized, double-blind, placebo-controlled, phase III study comparing the combination of PDR001, dabrafenib and trametinib versus placebo, dabrafenib and trametinib in previously untreated patients with unresectable or metastatic BRAF V600 mutant melanoma
PI \$507,335.00 (T). 08/01/17 - 07/31/20

Industry Sponsored Trial / UCI-16-92: A Phase III, Double-Blinded, Randomized, Placebo-Controlled Study of Atezolizumab Plus Cobimetinib and Vemurafenib versus Placebo plus Cobimetinib and Vemurafenib in Previously Untreated BRAFV600 Mutation-Positive Patients with Unresectable Locally Advanced or Metastatic Melanoma
PI \$689,151.00 (T). 2/15/17 - 5/30/22

Industry Sponsored Trial / UCI 16-63
Phase III Randomized, Open-label Study to Evaluate Efficacy and Safety of Pembrolizumab (MK-3475) in Combination with Axitinib versus Sunitinib Monotherapy as a First-line Treatment for Locally Advanced or Metastatic Renal Cell Carcinoma (mRCC) (KEYNOTE-426)
PI \$292,747.00 (T). 1/17/17- 07/5/20

Industry Sponsored Trial / UCI 15-12
A Phase III, Open-Label, Randomized Study of MPDL3280A (Anti-PD-L1 Antibody) in Combination with Bevacizumab versus Sunitinib in Patients with Untreated Advanced Renal Cell Carcinoma
PI \$5,268,204 (T). 09/24/15 - 09/23/20

Industry Sponsored Trial / UCI 14-82: PHASE III, RANDOMIZED, DOUBLE-BLIND, MULTICENTER TRIAL OF AUTOLOGOUS DENDRITIC CELLS LOADED WITH IRRADIATED AUTOLOGOUS TUMOR CELLS IN GM-CSF (DC-TC) VS. AUTOLOGOUS PERIPHERAL BLOOD MONONUCLEAR CELLS IN GM-CSF (MC) FOR THE TREATMENT OF PATIENTS WITH METASTATIC MELANOMA
PI \$216,091.00 (T). 06/25/15 - 06/24/20

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Industry Sponsored Trial / UCI 13-36: A Phase III randomized, 3-arm, open label, multicenter study of LGX818 plus MEK162 and LGX818 monotherapy compared with vemurafenib in patients with unresectable or metastatic BRAF V600 mutant melanoma
PI \$225,878.00 (T). 6/24/13 - 3/1/20

UCI 14-48: A Phase 2, Multicenter, Randomized, Open-label Trial Assessing the Efficacy and Safety of Talimogene Laherparepvec Neoadjuvant Treatment Plus Surgery versus Surgery Alone for Resectable, Stage IIIB to IVM1a Melanoma
PI: \$133,069.00 (T). 08/21/15 - 08/20/20

Investigator Initiated Research Contracts

HDII Clinical Trial UCI 09-53 Novartis
A Phase II, Single-Arm Study of Pazopanib and Paclitaxel as First-Line Treatment for Subjects
with Unresectable Stage III and Stage IV Melanoma.
PI \$560,730.00 (T) 6/24/10-12/31/20

HDII Clinical Trial UCI 10-55 Pfizer
Ph 2 Study of Anti-Angiogenesis Agent AG-013736 in Patients with Stage III Malignant Melanoma
PI \$469.970 12/15/11-5/11/20

Prior Completed Research Grant Support

1976	National Science Foundation Summer Research Award UCSB, Department of Chemistry
1980, 1981, 1982	March of Dimes Summer Research Fellowship Award Rush University Department of Pharmacology
1980	National Institutes of Health, COSTEP Program Laboratory of Immunodiagnosis, NCI, Dr. Ronald Herberman,
1981–1982	Pharmaceutical Manufacturers Association Foundation Medical Student Research Fellowship: Pharmacology-Clinical Pharmacology, Rush University
1994	NCI, NIH SBIR Grant, R43 CA60219-01, Development of a Therapeutic TNF-Degradation Product (\$75,000) PI
1994	NCI, NIH SBIR Grant, R43 CA61372-01, Development of an MDR-1 Resistance Reversal Assay (\$75,000) PI
2000	California Cancer Research Program, CRC Cycle-II Angiogenesis as predictor of metastatic risk (\$50,000) PI

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2001-2002	NCI, NIH R43 CA83551 A New High Throughput Assay for Human MDR1 Substrates (\$75,000) PI
2000–2001	NCI, NIH R21 Investigation of Angiogenic Function by MRI. Co-Investigator
2000-2003	NCI, NIH P20 CA-86182 Pre-Center Dvpmnt Grant, In Vivo Cellular and Molecular Imaging Centers Co-investigator
2001-2003	CA Breast Cancer Research Program 6JB-0029 Selective Thrombosis of Vessels for Anti-Angiogenic Therapy of Breast Cancer Co-Investigator
2002–2003	NCI, NIH R43 HL70490-01 Genomics Screening for Antiangiogenesis Drugs (\$75,000) PI
2001-2003	DOD DAMD 17-01-0178 Breast Cancer Research Program Anti-angiogenic Therapeutic Indicators in Breast Cancer Co-Investigator
2001–2007	NCI, NIH RO1 Prediction of Metastatic Disease in Early Breast Cancer PI, Sub-Contract
2008–2010	NCI, NIH R21 Lycopene & Docetaxel in Prostate Cancer: An IGF-I Receptor Targeting Approach Co-Investigator

Completed Clinical Translational Research Activities

2010–2013	Clinical Trial UCI 09-34 (GSK) A Double-Blind Randomized Placebo-Controlled Ph III Study to Assess Efficacy of recMAGE-A3+AS15 ASCI as Adjuvant Therapy in Patients with MAGE-A3 Positive Resected Stage III Melanoma PI
2009–2013	Clinical Trial UC 09-28 (GSK) Open, Single-Arm Study to Assess the Clinical Activity of recMAGE-A3 + AS15 in Patients With Unresectable, MAGE-A3 Positive Metastatic Cutaneous Melanoma PI
2008-2011	Translational Study (GSK) Oral Topotecan, Utilization of a Metronomic Dosing Schedule to Treat Recurrent Ovarian Cancer

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(\$24,000) PI

2008–2012 Clinical Trial UCI 07-55 (Wyeth)
Randomized Trial of Temsirolimus and Sorafenib as Second-Line Therapy in Advanced Renal Cell Carcinoma Who Have Failed First-Line Sunitinib Therapy.
(\$169,460) PI

2007-2009 Clinical Trial UCI 07-11 (Genentech)
Ph II Bevacizumab with Carboplatin & Paclitaxel in Metastatic Melanoma
(\$414,655) PI

2006-2008 Preclinical correlates ATN39758 and ATN224 (Attenuon)
Redox related antimelanoma activity of ATN224
(\$22,875) PI

2006-2009 Clinical Trial UCI 06-39 (Attenuon)
UCI 06-39: A randomized phase II trial of ATN-224 in combination with temozolomide or temozolomide followed by ATN-224 in systemic-treatment naive patients with advanced melanoma.
(\$107,467) PI

2006-2007 Clinical Trial UCI 04-48 (Cell Genesys)
A Phase III Randomized, Open-Label Study of CG1940 and CG8711 Versus Docetaxel and Prednisone in Patients with Metastatic Hormone-Refractory prostate Cancer who are Chemotherapy-Naive
(\$145,850) PI

2006-2008 Clinical Trial UCI 05-47 (GSK)
UCI 05-47 A Phase II Study of GW786034 Using a Randomized Discontinuation Design in Subjects with Locally Recurrent or Metastatic Clear-Cell Renal Cell Carcinoma
(\$69,335) PI

2006-2009 HDII Clinical Trial UCI 04-35 (Sanofi-Aventis)
Phase II Oxaliplatin with Gemcitabine for Stage IV Bladder Cancer
(\$227,925) PI

2006-2008 Preclinical Study OX-06-005 (Sanofi)
OX-06-005: “Defects in DNA adduct repair predict bladder cancer response to oxaliplatin”
(\$86,330) PI

2005–2010 HDII Clinical Trial UCI 02-23 (Berlex/Bayer)
Docetaxel plus Vinorelbine with Sargramostim for Stage IV Melanoma
(\$209,258) PI

2005-2007 Clinical Trial UCI 05-19 (Attenuon)
A Dose Ranging Phase II Open Label Study of ATN161 in Advanced Renal Cell Cancer
(\$246,491) PI

2004-2007 Clinical Trial UCI 04-34 (Pfizer)
Phase II Antiangiogenesis Study of AG 013736 for Stage IV Melanoma
(\$136,209) PI

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1999–2007 HDII Clinical Trial, UCI 99-25R (GSK)
Topotecan plus cisplatin followed by paclitaxel consolidation for the treatment of stage III and IV epithelial ovarian cancer and primary peritoneal cancer with in vitro correlates of response (\$72,813) PI

Editorial Activities

World Journal of Clinical Oncology Editorial Board Member

Ad Hoc Reviewer

Gynecologic Oncology
Breast Cancer Research and Treatment
Clinical Cancer Research
Anti-Cancer Drugs
The Cancer Journal
European Journal of Cancer
Pharmacological Research
Cancer

Study Sections

6/94 NCI, NIH: Ad Hoc Contracts Technical Review Group for Phase I Studies
3/03 NCI, NIH: ZES RAM-C-C3, Special Emphasis Panel for the Review of Development Of Microarray Profiles for Microbial Toxicity
4/03 NCI, NIH: ZRG SSS-1 12B, Diagnosis and Treatment of Cancer
6/07 NCI, NIH Cancer Center Renewal Site Visit Team, NYU
6/99 HHS Medicare Negotiated Rulemaking Taskforce: Author of Medicare Tumor Marker Coverage Policy for CA125

University Service

1996–2010 Member, UC Irvine Translational Seed Grants Committee
1999–2002 UC Irvine Institutional Biosafety Committee
1999–2004 Chair, Clinical Trials Protocol Review and Monitoring Committee
2003 Chair, Search Committee, UCI Department of Radiology
2005–2008 Member, UC Irvine Allied Health Committee
2006–2007 UC Wide Scientific Advisory Committee for Pharmacology
2008–2022 Vice Chair, UC Irvine Institutional Review Board B
2020 -Present Chair, UC Irvine Institutional Review Board WB
2010–Present Chair, Cancer Center Data Safety and Monitoring Board
2017-Present Chair, UC Irvine Institutional Review Board WB

Supervision of Graduate Students

Co-Chair, PhD Defense Committee: John Sinek, Biomedical Engineering 2005
Co-Chair, PhD Committee: Hermann Frieboes, Biomedical Engineering 2005

Primary PhD Advisor:

2004-2009 Valerie Trapp, PhD awarded Biomedical Engineering,
2007-2012 Basmina Parmakhtiar, PhD awarded Biological Chemistry
2010-2012 Maliheh Movassat, Biological Chemistry

Post Doctoral Trainees/Fellows Mentoring

2005-2007 Ernest Han, Fellow Gyn/Onc

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2007-2008 Leslie Randall-Whitis, Fellow Gyn/Onc
2008-2009 Dana Chase, Fellow Gyn/Onc
2012-2013 Shlomid Ein-Gal, Fellow, Heme/Onc
2013-2014 GK Ford, Fellow, Gyn/Onc
2014-2016 Teresa Longoria, Fellow Gyn/Onc
2015-2016 Sarmen Sarkissian, Fellow Heme/Onc
2016-2017 Monica El-Masry, Fellow Heme/Onc

Masters Students Mentoring:

2005–2006: Miranda King, Biotechnology
2006–2007: Peter Foss, Biotechnology

Undergraduate Research Supervision

Bio 199 Instructor: 4-5 students per quarter 2004–Present

Teaching Experience

2007 to Present: Pharmaceutical Sciences M172 Course Director, Fall Quarter

Patents (Citations)

Treatment of Tumor Cells with TNF Degradation Products.
US Patent No 5,543,139, Aug 6, 1996
Methods for Cancer Prognosis and Diagnosis: Angiogenesis Index.
US Patent No 5,840,507. April 11, 1997
Radiation Resistance Assays for Predicting Treatment Response and Clinical Outcome.
US Patent No 6,008,007. Dec 28, 1999 (44)
(Co-Inventor: Dr. R. Parker)
Methods for Cancer Prognosis and Diagnosis
US Patent No 6,303,324. Nov 24, 1998 (19)
Radiation Resistance Assays for Predicting Treatment Response and Clinical Outcome.
US Patent No 6,261,795. July 17, 2001 (20)
(Co-Inventor: Dr. R. Parker)
Methods and Reagents for Preparing and Using Immunological Agents Specific for
P-glycoprotein.
US Patent No 6,365,357. April 2, 2002
(Co-inventor: Dr. E. Mechetner)
Methods for In Vitro Genotyping of Drug-Sensitive and Drug-Resistant Subsets of Primary
Tumors.
US Patent No 6,511,806. January 28, 2003 (19)
Methods for cancer prognosis and diagnosis relating to tumor vascular endothelial cells.
US patent No 6,998,234. February 14, 2006 (7)

Google Scholar: Citations 6325: h-Index 43

Peer Reviewed Publications (# Citations)

1. **Fruehauf JP**, Bonnard GD, Herberman RB. The effect of lentinan on production of interleukin-1 by human monocytes. Immunopharmacology 5:65-74, 1982. (118)
2. **Fruehauf JP**, Myers CE, Sinha BK. Synergistic activity of suramin with tumor necrosis factor and doxorubicin on prostate cancer cell lines. J Natl Cancer Inst 82:1206-1209, 1990. (70)

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3. **Fruehauf JP**, Mimnaugh E, Sinha BK. Doxorubicin-induced cross-resistance to tumor necrosis factor (TNF) related to differential TNF processing. *J Immunotherapy* 10:165-173, 1991. (15)
4. Mimnaugh EG, Fairchild CR, **Fruehauf JP**, Sinha BK. Biochemical and pharmacological characterization of MCF-7 drug-sensitive and AdrR multidrug-resistant human breast tumor xenografts in athymic nude mice. *Biochemical Pharm* 42:391-402, 1991. (48)
5. **Fruehauf JP**, Sinha BKS. Selective formation of tumor necrosis factor alpha (TNF) degradation products contributes to TNF mediated cytotoxicity. *Oncology Res* 4:91-101, 1992. (11)
6. Santin AD, Hiserodt JC, **Fruehauf J**, DiSaia PJ, Pecorelli S, Granger G. Effects of irradiation on the expression of surface antigens in human ovarian cancer. *Gynecol Oncol* 60:468-474, 1996. (37)
7. Santin AD, Rose GS, Hiserodt JC, **Fruehauf J**, Eck LM, Garcia RI, Schranz V, DiSaia PJ, Pecorelli S, Granger GA. Effects of tumor necrosis factor-alfa plus interferon-gamma combined with high dose gamma irradiation on the expression of major histocompatibility complex molecules and intercellular adhesion molecule-1 in human ovarian cancers. *Intl J Cancer* 65:688-694, 1996. (4)
8. Santin AD, Hermonat PL, Hiserodt JC, Fruehauf J, *et al.* Differential Transforming Growth Factor- β secretion in adenocarcinoma and squamous cell carcinoma of the uterine cervix. *Gyn Onc* 64:476-480, 1997. (29)
9. **Fruehauf JP**, Zonis S, Al-Bassam M, Kyshtoobayeva A, Dasgupta C, Milovanovic T, Parker RJ, Buzaid AC. Selective and synergistic activity of L-S,R-buthionine sulfoximine on malignant melanoma is accompanied by decreased expression of glutathione-S-transferase. *Pigment Cell Res* 10:236-249, 1997. (21)
10. Mechetner E, Kyshtoobayeva A, Zonis S, Kim H, Stroup R, Garcia R, Parker RJ, **Fruehauf JP**. Levels of multidrug resistance (MDR1) P-glycoprotein expression by human breast cancer correlates with in vitro resistance to taxol and doxorubicin. *Clinical Cancer Res* 4:389-398, 1998. (340)
11. Grant SW, Kyshtoobayeva AS, Jakowatz J, **Fruehauf JP**. Mutant p53 correlates with reduced expression of thrombospondin-1, increased angiogenesis, and metastatic progression in melanoma. *Cancer Det Prev* 22(3): 185-195, 1998. (96)
12. Coppola D, Lu L, **Fruehauf JP**, Kyshtoobayeva A, Karl RC, Nicosia SV, Yeatman TJ. Analysis of p53, p21 WAF1, and TGF-beta 1 in human ductal adenocarcinoma of the pancreas: TGF-beta1 protein expression predicts longer survival. *Am J Clin Pathol* 110:16-23, 1998. (73)
13. **Fruehauf JP**, Zonis, S., Al-Bassam, M., Kyshtoobayeva, A., Dasgupta, G., Milovanovic, T., Parker, R., Buzaid, A.C. Melanin content and down regulation of glutathione-S-transferase contribute to the action of L-buthionine-S-sulfoximine on human melanoma. *Chemico-Biological Interactions*. 111-112: 277-305, 1998. (31)
14. Haber M, Bordow SB, Gilbert J, Madafiglio J, Kavallaris M, , Marshall GM, Mechetner EB, **Fruehauf JP**, Tee L, Cohn SL, Salwen H, Schmidt ML, Norris MD. Altered expression of the MYCN oncogene modulates MRP gene expression and response to cytotoxic drugs in neuroblastoma cells. *Oncogene*, 18:2777-2782, 1999. (83)

15. Moore MM, Tewari KT, Rose S, **Fruehauf JP**, DiSaia PJ. Long-term consequences following conservative management of epithelial ovarian cancer in an infertile patient. *Gynecol Oncol* 73: 452-454, 1999. (19)
16. Tewari K, Kyshtoobayeva AS, Mehta RS, Yu I-R, Burger RA, DiSaia PJ, **Fruehauf JP**. Biomarker conservation in primary and metastatic epithelial ovarian carcinoma. *Gynecol. Oncol.* 78:130-136, 2000. (56)
17. Mehta R, Kyshtoobayeva A, Kurosaki T, Small EJ, Kim H, Stroup R, McClaren C, Li K-T, **Fruehauf JP**. Independent association of angiogenesis index with outcome in prostate cancer. *Clinical Cancer Res* 7:81-88, 2001. (121)
18. Mehta RS, Bornstein R, Yu IR, Parker RJ, McLaren CE, Nguyen KP, Li K-T, **Fruehauf JP**. Breast cancer survival and *in vitro* tumor response in the Extreme Drug Resistance Assay. *Breast Cancer Research and Treatment* 66:225-237, 2001. (65)
19. Reavy-Cantwell JF, Haroun RI, Zahurak M, Clatterbuck RE, Parker RJ, Mehta R, **Fruehauf JP**, Brem H. The prognostic value of tumor markers in patients with glioblastomas multiforme: analysis of 32 patients and review of the literature. *J Neuro-Onc* 55:195-204, 2001. (101)
20. Ellis RJ, Fabian CJ, Kimler BF, Tawfik O, Mayo MS, Decelis CR, Jewell WR, Connor C, Modrell C, Praeger M, McGinness M, Mehta R, **Fruehauf JP**. Factors associated with success of the extreme drug resistance assay in primary breast cancer specimens. *Breast Cancer Res Treat* 71:95-102, 2002. (11)
21. Haroun RI, Clatterbuck RE, Gibbons MC, Burger PC, Parker R, **Fruehauf JP**, Brem H. Extreme drug resistance in primary brain tumors: in vitro analysis of 64 resection specimens. *J Neuro-Onc* 58:115-123, 2002. (23)
22. Holloway RW, Mehta RS, Finkler NJ, Li K-T, McLaren CE, Parker RJ, **Fruehauf JP**. Association between in vitro platinum resistance in the EDR assay and clinical outcomes for ovarian cancer patients. *Gynecol Oncol* 87:8-16, 2002. (107)
23. Monk BJ, Burger RA, Parker R, Radney EH, Redpath L, **Fruehauf JP**. Development of an *in vitro* chemo-radiation response assay for cervical carcinoma. *Gynecol Oncol* 87:193-199, 2002. (13)
24. Su M-Y, Yu H, Chiou J-Y, Wang J, **Fruehauf JP**, Nalcioglu O, Mehta RS, Baick CH. Measurement of volumetric and vascular changes with dynamic contrast enhanced MRI for cancer therapy monitoring. *Technology in Cancer Research and Treatment*, 1(6): 479-488, 2002. (15)
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Selected Invited Lectures (1999-2016)

International Gynecologic Cancer Society Meeting, Nervi Cathedral, The Vatican, Rome, Italy, 8/99.

“Association between breast cancer survival and in vitro drug response in the EDR assay.”

University of Wisconsin Comprehensive Cancer Center Grand Rounds, 8/9/99.

“In Vitro drug response assays in drug development and treatment selection.”

Duke University Department of Gynecologic Oncology Tumor Board, 12/6/99.

“Use of prognostic and predictive factors in ovarian cancer management.”

Louisiana State University Dept. of Medicine Grand Rounds, 12/7/99.

“Angiogenesis and in vitro drug response testing as guides in cancer patient management.”

University of North Carolina Dept. of Obstetrics and Gynecology Grand Rounds, 12/8/99.

“In vitro testing in treatment selection for gynecologic cancers.”

**Smi Phrama Conf.: Commercial Issues in Oncology Drug Development
London, England, 9/10/01**

“Molecular correlates of proteogenomics in the identification of new diagnostic and therapeutic targets.”

**1st Symposium of the International Society for Chemosensitivity Testing in Oncology –
ISCO-1, Homburg, Germany, 9/14/01**

“Maximizing chemoresistance testing data for the clinician.”

Cancer Care Ontario Conference, Ontario, Canada, 11/12/01

New Technologies: Applications to Cancer research, Diagnosis and Treatment

“Extreme drug resistance (EDR) assays, DNA microarray analysis and flow cytometric assessment of drug induced apoptotic potential from freshly resected human tumor samples.”

**UT MD Anderson Cancer Center’s 43rd Annual Clinical Conference
Drug Discovery and Clinical Evaluation in the 21st Century. Houston, TX, 1/16/02**

Fruehauf JP

“Clonogenic Assays.”

**Yale University Medical School Department of Pathology
Grand Rounds, New Haven, CT 2/7/02**

“Molecular Determinants of Drug Action and Approaches to Rational Treatment”

Society of Gynecologic Oncology Sunrise Session, Miami, FLA 3/18/02

“Use of In Vitro Drug Response Assays in Clinical Practice”

Baltimore Oncology Club, Baltimore, MD 1/16/03

“Prognostic and Predictive Testing to Guide Therapy of Cancer Patients”

Worldwide Oncoimaging Conference, Athens, 9/4/05

“Advances in imaging from the oncologist’s perspective”

International Immunologic Emerging Therapies Summit, Pheonix AZ, 10/8/05

“Metastatic Melanoma: A Docitaxel Plus Navelbine Combination
with Sargramostim Support”

Korean Society of Gynecological Oncology and Colposcopy, Gyeongju, Korea, 4/21/06

“Utility of In vitro drug response assays”

**University of Utah Cancer Center Grand Rounds, Salt Lake City, Utah
9/12/07**

“Current approach to the treatment of melanoma”

**Northwest Melanoma Symposium: Science to Survivorship,
Fred Hutchinson Cancer Research Center, Seattle, WA
11/ 2/07**

“Advances in the therapy of Melanoma”

Oncology Congress, San Francisco CA, 9/28/08

“Advanced Melanoma Treatment Update”

ASCO Plenary Melanoma Session 6/2/2008

Axitinib (AG-013736) in patients with metastatic melanoma: A phase II study.

Pacific Dermatology Society Annual Meeting. Huntington Beach, CA, 8/23/12

“Updates on Treatment of Advanced Melanoma”

Medical Oncology Association of Orange County, Irvine CA 7/16/15

“Melanoma it the Spotlight on ASCO”

Medical Oncology Association of Orange County, Huntington Beach CA 7/16/16

“Melanoma it the Spotlight on ASCO”

Medical Oncology Association of Orange County, Huntington Beach CA 8/11/18; 8/17/19

“ASCO update on Melanoma”

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