

Fourth International Chordoma Research Workshop

March 21 and 22, 2013

PARTICIPANT PROFILES

David A. Alcorta, PhD

Duke University
E31019 DVAMC
508 Fulton St.
Durham, NC 27705

Primary Specialty: Molecular Biology

Bio: I am a scientist that uses cell and molecular approaches to understanding mechanisms of cancer.

Projects: I work with Dr. Kelley's laboratory at Duke University/VA Medical Center. We are exploring the cellular and phenotypic changes that cause the formation of a chordoma.



Michelle Alonso-Basanta, MD, PhD

Radiation Oncologist
University of Pennsylvania
3400 Civic Center Blvd
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Misha Angrist, PhD

Assistant Professor
Institute for Genome Sciences and Policy
Duke University
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Durham, NC 27707



Igor Barani, MD

Assistant Professor of Radiation Oncology
UCSF
505 Parnassus Ave Rm L08
San Francisco, CA 94143-0226

Primary Specialty: Radiation Oncology

Bio: Dr. Igor Barani is an Assistant Professor in Radiation Oncology at the University of California, San Francisco (UCSF). He specializes in stereotactic radiosurgery and its various applications as well as re-treatments of brain and spine tumors.



Garni Barkhoudarian, MD

Saint John's Brain Tumor Center
2200 Santa Monica Blvd
Santa Monica, CA 90404-2302

Primary Specialty: Skull Base Surgery

Bio: Dr. Garni Barkhoudarian is a practicing clinician and researcher at the Brain Tumor Center at the John Wayne Cancer Institute. He completed his residency at the UCLA Medical Center and completed a fellowship in Pituitary Surgery and Neuroendoscopy at the Brigham and Women's Hospital. His clinical and research focus includes transsphenoidal operations and skull-base surgery.



Yair Benita, PhD

40 Clark Rd
Brookline, MA 02445-6030

Primary Specialty: Computational Biology

Bio: I am a computational biologist working in the oncology space. I develop computational tools that use high-throughput data (Next generation sequencing, gene expression profiling, knockdown screens and over-expression screens) to build molecular models of cancer biology. My work enables cancer target discovery, drug mechanism of action and biomarker identification for patient stratification.

Projects: I am interested in identifying the underlying mechanism of chordoma biology and identify potential drugs to be tested.

Chetan Bettgowda, MD, PhD

Johns Hopkins University
Assistant Professor of Neurosurgery and Oncology
600 N Wolfe St
Baltimore, MD 21287-0005

Primary Specialty: Brain and Pituitary Tumors

Bio: I am interested in understanding the genetic basis of chordomas, as well as developing novel therapeutic lines of investigation.

Mark H. Bilsky, MD

Neurosurgeon
Memorial Sloan-Kettering Cancer Center
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Primary Specialty: Spine and Brain Tumors

Árpád Bozsódi, MD, PhD

Buda Specialty Hospital Health Center
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Hungary



Justin Cates, MD, PhD

Associate Professor
Vanderbilt University Medical Center
Department of Pathology, C-3322 MCN
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Primary Specialty: Pathology



Bruce Chabner, MD

Director of Clinical Research, Cancer Center
Massachusetts General Hospital
10 Grove St
Boston, MA 02114-3411

Primary Specialty: Medical Oncology

E. Antonio Chiocca, MD, PhD

Chairman of Neurosurgery
Brigham and Women's Hospital
75 Francis St
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Boston, MA 02115-6110

Bio: Dr. Chiocca is a neurosurgeon-scientist who has had continuous NIH peer reviewed funding for over 15 years. His research program has focused on the biology of malignant gliomas, one of the deadliest cancers in humans, and exploring the use of biological agents as novel glioma therapeutics. He has authored or co-authored over 200 peer-reviewed publications and has been a member and/or officer of multiple national medical societies and is a current member of the NIH Recombinant DNA Advisory Council and of the National Advisory Council of the National Institutes of Neurological Disorders and Stroke. He was Chairman of the Department of Neurological Surgery at the Ohio State University Wexner Medical Center from 2004-2012. He is currently Chair and Neurosurgeon-In-Chief in the Department of Neurosurgery at the Brigham and Women's Hospital and Professor of Medicine at Harvard Medical School.

Edwin Choy, MD, PhD

Director of Sarcoma Research
Massachusetts General Hospital
55 Fruit St
Boston, MA 2 02114-2621

Primary Specialty: Hematology/Oncology



Thomas Delaney, MD

Medical Director, Burr Proton Therapy Center
Massachusetts General Hospital
Dept. of Radiation Oncology
F.H. Burr Proton Therapy Ctr. 30
Boston, MA 02114



Primary Specialty: Radiation Oncology

Bio: Dr. DeLaney is a graduate of Harvard College and Harvard Medical School. Following an internship in General Surgery at Yale-New Haven Hospital, he trained in Radiation Oncology at the Massachusetts General Hospital. He then spent 6 years as a Senior Investigator at the National Cancer Institute in Bethesda MD. Since 1992, he has been on the staff of the Massachusetts General Hospital and on the faculty of Harvard Medical School. Currently, he is the Medical Director of the Francis H. Burr Proton Therapy Center at Massachusetts General Hospital, Co-Director of the Center for Sarcoma and Connective Tissue Oncology at Massachusetts General Hospital, and Professor of Radiation Oncology, Harvard Medical School. He has served as an Executive Board Member of the Connective Tissue Oncology Society, is a member of the National Comprehensive Cancer Network Soft Tissue Sarcoma Guidelines Panel, and serves as a member of the Scientific Advisory Board of the Chordoma Foundation. He is active in the Radiation Therapy Oncology Group Sarcoma Working Group. Dr. DeLaney has made contributions to the treatment of soft tissue and bone sarcomas and is actively involved in clinical research in this area as well as the use of charged particle (proton) radiation therapy. His bibliography lists 73 original reports as well as 89 reviews, book chapters, editorials, and clinical guidelines. He, along with Hanne Kooy, Ph.D. edited the book, Proton and Charged Particle Radiotherapy(Lippincott Williams and Wilkins, Philadelphia, 2007). He is on the editorial boards of Annals of Surgical Oncology, Journal of Surgical Oncology, Journal of Clinical Oncology, and UpToDate in Oncology.

Interests: Actively involved in the treatment of spine chordomas with combinations of surgery and high dose photon/proton radiation, or with high dose photon/proton radiation in selected patients with unresected chordomas.

Projects: We are developing pencil beam scanned intensity modulated proton therapy for patients with spine chordomas. We are investigating hypoxia in patients with chordomas using F-18 misonidazole PET CT scans.

Resources Available: Principal investigator of a multi-institutional (Mass. General Hospital and M.D. Anderson Cancer Center), NCI-funded program project grant (2008-2013) that includes a clinical project using pencil-beam scanned, intensity modulated proton radiation.

Anna Di Gregorio, PhD

Associate Professor of Cell and Developmental Biology
Weill Cornell Medical College
1300 York Ave # 60
New York, NY 10065-4805



Bio: Dr. Di Gregorio obtained her undergraduate degree summa cum laude in Biological Sciences from the University "Federico II" in Napoli (Naples), Italy, in 1990, and her Ph.D. in Molecular and Cellular Biology and Pathology from the same university, jointly with the Stazione Zoologica "Anton Dohrn", Napoli, in 1995. Her experimental work is predominantly focused on marine invertebrates, first the Mediterranean sea urchin *Paracentrotus lividus* and later the ascidian *Ciona intestinalis* (sea squirt). From September 1996 until the end of 2002 she was a post-doctoral fellow in Dr. Mike Levine's lab at the University of California at Berkeley, where she expanded her work on *Ciona* through the characterization of cis-regulatory modules, DNA sequences that contain the information necessary for the correct spatial and temporal expression of genes. Research in the Di Gregorio lab, which was established at the beginning of 2003, focuses on elucidating cis-regulatory mechanisms controlling gene expression during development and evolution of the chordate body plan. The main focus of the lab's research are the evolutionary origins and development of the notochord. The notochord is an axial structure that 'precedes' the backbone, during evolution and during prenatal development. The gene *Brachyury* encodes an evolutionarily conserved transcription factor expressed in the notochord. *Brachyury* functions as a crucial activator of gene expression in notochord formation during the embryogenesis of organisms as different as sea squirts and human embryos. In humans *Brachyury* is up-regulated in notochord-derived tumors called chordomas.

Interests: My work focuses on understanding how the transcription factor *Brachyury* controls gene expression in notochord cells. These cells are the ones that can give rise to chordomas and *Brachyury* has been recently implicated in chordoma etiology.

Roberto Diaz, MD

Neurosurgeon, PhD Candidate
University of Toronto
101 College St
Toronto, ON M5G 1L7
Canada

Bio: Dr. Diaz grew up in Toronto, Canada and completed his undergraduate studies in Human Biology at the University of Toronto. After graduating from the M.D. program at the University of Toronto he started Neurosurgery residency at the University of Calgary in Alberta, Canada. He is currently a PhD candidate in Department of Laboratory Medicine & Pathobiology at the University of Toronto and a 5th year Neurosurgery Resident. His research interests include cancer genetics, cell-cycle regulation, small-molecule and nanoparticle therapeutics.

Projects: DNA copy number aberrations that occur in skull base chordomas. The finding of chromosome 3 aneuploidy in our study and others lead us to explore the possible role of FHIT a tumor suppressor on chromosome 3 in chordoma pathogenesis. We found FHIT protein expression is lost in 98% of sacral and 67% of skull base chordomas. FHIT is a putative tumor suppressor and loss of FHIT may be responsible for the chemo and radioresistance shown by chordoma.

Zhenfeng Duan, MD, PhD

Director of Sarcoma Research
Massachusetts General Hospital
70 Blossom St
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Al Ferreira, RN

Nurse Corodinator
The Harris Center for Chordoma Care at MGH
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Boston, MA 02114
Primary Specialty: Orthopeadic Oncology Nursing

Adrienne Flanagan, MD, FRCPath, PhD

Professor of Pathology
University College London Cancer Institute
Royal National Orthopaedic Hospital
72 Huntley Street
London, England WC1E 6BT
United Kingdom

Primary Specialty: Pathologist

Bio: I am a pathologist specializing in bone and soft tissue tumours.

A few years ago with my team I identified that brachyury was highly sensitive and specific for the diagnosis of chordoma. Since then we have identified that chordomas (brachyury and CK19+ tumours) also occur in soft tissue and in skeletal extra-axial sites.

Projects: We are: 1. studying what effect brachyury mediates on mesenchymal stem cells 2. studying how to maintain chordoma cell lines and 3. attempting to identify if there are biomarkers for clinical progression.



Andreas Fritz, PhD

Associate Professor
Emory University
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Bio: Education: 1983 Diploma in Biology II, University of Basel, Switzerland
1988 D. phil. in Biology, University of Basel, Switzerland
Employment: 1988-91 Postdoctoral Fellow with Dr. E. Hafen, Institute of Zoology, University of Zurich; 1991-97 Postdoctoral Fellow with Dr. M. Westerfield, Institute of Neuroscience, University of Oregon; 1998-2004 Assistant Professor, Department of Biology, Emory University; 2004- Associate Professor, Department of Biology, Emory University; 2004-2008 Director of Graduate Studies, Program in Genetics & Molecular Biology; 2008-2011 Director, Graduate Program in Genetics & Molecular Biology



Gary Gallia, MD, PhD

Director, Neurosurgery Skull Base Surgery Center
Johns Hopkins University
600 N Wolfe St
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Primary Specialty: Brain and Skull Base Surgery

Bio: Dr. Gallia is an Assistant Professor of Neurosurgery, Otolaryngology - Head and Neck Surgery, and Oncology and also the Director of the Skull Base Center at Johns Hopkins. Dr. Gallia's specialty is endoscopic endonasal surgical approaches to skull base pathologies with a focus on neurosurgical oncology. He utilizes the latest techniques in preoperative imaging, computer guided surgical navigation, intraoperative monitoring and minimally invasive and neuroendoscopic approaches in the management of patients with benign and malignant brain tumors, metastatic tumors to the brain, skull base neoplasms and pituitary tumors.

Dr. Gallia's primary research interests are in the development of novel therapeutics against malignant brain and skull base tumors, outcomes following endonasal endoscopic skull base surgery and development of next generation intraoperative endoscopic platforms.

Dr. Gallia graduated summa cum laude from the Gibbons Scholar MD/PhD program at Jefferson Medical College and Thomas Jefferson University. He completed his general surgery internship at Johns Hopkins Hospital where he was awarded surgical intern of the year. He then completed his neurological surgery residency and a postdoctoral fellowship in neuro-oncology at Johns Hopkins Hospital. Following residency, he completed a minimally invasive and endoscopic neurosurgery fellowship with Dr. Charles Teo at the Prince of Wales Private Hospital and Sydney Children's Hospital in Sydney, Australia.

Paul Gardner, MD

Asst. Professor, Co-Director Skull Base Surgery
University of Pittsburgh Medical Center
Department of Neurosurgery
200 Lothrop St.
Pittsburgh, PA 15213-2536



Primary Specialty: Skull Base Surgery

Lukas Tsepo Goerttler

University of Ulm
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Germany

Bio: I am a medical student from Germany and I am writing my thesis on the topic of chordomas.

Sukru Gulluoglu

Yeditepe University PhD Student
Bengi Sok. Derya Apt. No:12 Erenkoy
Kayisdagi, Istanbul 34854
Turkey



Brian Harfe, PhD

Associate Professor
University of Florida
Genetics Inst.
1376 Mowry Road
PO Box 103610
Gainesville, FL 32610-0001

Primary Specialty: Developmental Biology

Bio: Dr. Harfe obtained a BS (honours) degree from the University of Glasgow in Glasgow, Scotland and a Ph.D. investigating muscle development in the nematode *C. elegans* in the laboratory of Dr. Andrew Fire (2006 Nobel Prize winner for his discovery of RNAi) at Johns Hopkins University. After obtaining his Ph.D. he moved to Emory University and began a postdoctoral position in the laboratory of Dr. Sue Jinks-Robertson working on DNA damage pathways in yeast. In 2000, he moved to Boston where he began a second postdoctoral position in the laboratory of Dr. Cliff Tabin at Harvard Medical School working on the molecular pathways responsible for limb formation using the mouse and chick model systems. In 2003, he became an Assistant Professor in the Molecular Genetics and Microbiology Department at the University of Florida (UF) College of Medicine in Gainesville, Florida. Currently, he is an Associate Professor (tenured) in the UF College of Medicine, Director of the Program in Developmental Genetics and a Provost Fellow. Current projects in the Harfe laboratory include investigating limb and intervertebral disc development using the mouse, chick and *C. elegans* model systems.



David Harmon, MD

Medical Oncologist
Massachusetts General Hospital
23 Myrtle St
Belmont, MA 02478-3004

Primary Specialty: Chordoma and Sarcoma

Bio: Clinician involved in taking care of patients with chordomas and sarcomas at MGH. Contributor to clinical trials.

Christopher Heery, M.D.

Staff Clinician
National Cancer Institute
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Primary Specialty: Tumor Immunology and Biology

Bio: Medical oncologist specializing in cancer immunotherapy. Involved in the development of the first vaccine targeting Brachyury in cancer patients.

Katheryn Hess

Massachusetts General Hospital Spine Center
Clinical Research Coordinator
55 Fruit St
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Bradford Hirsch, MD

Assistant Professor of Medicine
Duke University
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Primary Specialty: Medical Oncology

Bio: Dr. Hirsch is a practicing medical oncologist at the Duke University School of Medicine and Director of Clinical Informatics and Learning Laboratories in the Center for Learning Health Care at the Duke Clinical Research Institute. His research focuses on addressing evidence gaps within clinical research in oncology and the development of novel informatics and mobile health solutions. He is an expert in both health services and comparative effectiveness research.

Jeff Hodge

Vice President of Clinical Strategy
and Delivery in Oncology
Quintiles
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Bio: In his 18 years of drug development experience in oncology, Jeff has led more than 10 early development assets from candidate selection (pre-IND) to proof of concept (Phase II) in the Early Development Unit for Cancer Research at GlaxoSmithKline and Quintiles. Jeff has lead programs that target VEGF, MEK, KSP, CENPE, Aurora Kinase, EGFR/HER2, RNA polymerase, endothelin-A receptor (ETAR) antagonist, and a pro-drug of ara-G. Jeff has been responsible for creation of clinical development plans, study protocols, budgets, and timelines. He has participated in country regulatory meetings and assisted development of submission dossiers for 2 NDA approvals and 5 INDs. Jeff led approval of pazopanib (VOTRIENTM) for advanced/metastatic renal cell carcinoma as the Lead Clinical Pharmacologist. Represented GSK

at ODAC for RCC submission. Jeff has authored more than 70 abstracts, presentations, and publications in peer-reviewed journals. In his current role, Jeff is Vice President and Global Head, Clinical Strategy and Delivery in Oncology at Quintiles. Jeff is leading a co-development partnership between Eisai and Quintiles, responsible for the development and management of a broad oncology portfolio.

Francis Hornicek, MD, PhD

Surgeon
Chief, Orthopaedic Oncology Service
Massachusetts General Hospital
55 Fruit St Suite 3700
Boston, MA 02114-2621



Primary Specialty: Bone and soft tissue tumors

Bio: Dr. Francis Hornicek is Chief of the Orthopaedic Oncology Unit at Massachusetts General Hospital and an Associate Professor in the Department of Orthopaedic Surgery at Harvard Medical School. Dr. Hornicek received his M.D. from the University of Pittsburgh School of Medicine and his Ph.D. from Georgetown University School of Medicine. Dr. Hornicek has a long-term interest in clinical care and research.

Wesley Hsu, MD

Neurosurgeon and Assistant Professor
Wake Forest Baptist Medical Center
Medical Center Blvd
Winston-Salem, NC 27157



Primary Specialty: Primary and secondary tumors of the osseous spine and spinal cord

Bio: Dr. Hsu is an Assistant Professor of Neurosurgery and Orthopedic Surgery at Wake Forest Baptist Health.

Dezső Jészenszky, MD

Spine Surgeon
Schulthess Clinic, Spine Center
Lengghalde 2
Zurich 8008
Switzerland

Robin Jones, MD, MRCP

Medical Oncologist
University of Washington Medical Center
825 Eastlake Ave E
G3630
Seattle, WA 98109-4405
Primary Specialty: Adult bone and soft tissue sarcoma

Richard Jove, PhD

Professor, Molecular Medicine
Beckman Research Institute at City of Hope
1500 Duarte Rd
Duarte, CA 91010-3012

Bio: Richard Jove, Ph.D., earned his doctoral degree in molecular biology at Columbia University and pursued postdoctoral training in molecular oncology at Rockefeller University, New York City. In 1988, Dr. Jove was appointed Assistant Professor at the University of Michigan, Ann Arbor, and then promoted to Associate Professor with Tenure. He was subsequently recruited in 1995 to the Moffitt Cancer Center in Tampa FL, where he was Professor and Director of the Molecular Oncology Program and later Associate Director for Basic Research. Since 2005, Dr. Jove served as Deputy Director of the City of Hope NCI Comprehensive Cancer Center and then Director of the Beckman Research Institute at City of Hope in the Los Angeles area. Currently, he is on sabbatical as Emeritus Director and Professor of Molecular Medicine to focus on his own research on tyrosine kinase signaling pathways involved in cancers. Dr. Jove was among the first groups to directly link STAT3 signaling to oncogenesis and to validate it as an important therapeutic target. He has published over 200 research articles and been continuously funded by the NIH for the past 25 years. Dr. Jove's primary research interests are development of molecular targeted therapeutics for cancer.



Michael Kelley, MD

Associate Professor of Medicine
Duke University
508 Fulton St Hematology/Oncology 111G
Durham, NC 27705-3875

Primary Specialty: Medical Oncology



Matthew Klusas

Director of Corporate Development
ATCC
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Karin Laky, MD

Erlengasse 7
Voitsberg, 8570
Austria

Primary Specialty: Surgery

Bio: I have been working in hospital since 1992 and began surgery in 1995. My work is general surgery with specification in varicosis and abdominal surgery. Our hospital is a department of the clinic in Graz. We work also in exchange with the clinic, where we also have contact to patients with tumors.

David Langenau, PhD

Principal Investigator, Langenau Lab
Massachusetts General Hospital
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Bio I have extensive expertise in zebrafish models of cancer, having developed the first zebrafish transgenic model of cancer in 2003 with Dr. A Thomas Look at Dana Farber Cancer institute (Langenau et al, Science 2003). I have also worked with Dr. Leonard Zon at Children's Hospital Boston to establish cell transplantation approaches to assess tumor-initiating potential in zebrafish cancer and developed a novel model of embryonal rhabdomyosarcoma in 2007 (Langenau et al., Genes & Development 2007). This latter work was the first description of using zebrafish to identify a cancer-initiating cell in this devastating pediatric malignancy. Since starting my own laboratory in 2008, we have continued to use the zebrafish as a model of cancer and have focused on 1) developing high-throughput cell transplantation approaches to uncover relapse mechanisms that drive tumor-initiation in leukemia and rhabdomyosarcoma (Langenau et al., Oncogene 2008; Smith et al., Blood 2010; Blackburn et al., Nature Protocols 2011; Journal of Visual Experimentation, in press) and 2) imaging self-renewal mechanisms directly within living zebrafish affected with cancer, muscle injury, and muscle disorders (Ignatius et al., Cancer Cell 2012).

Ilya Laufer, MD

Neurosurgeon
MSKCC - Department of Neurosurgery
1275 York Ave
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Primary Specialty: Spinal disorders

Heather Lee, PhD

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Yang Lee, PhD

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Andreas Leithner, MD

Medical University of Graz
Auenbruggerplatz 5
Graz 8036
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Primary Specialty: Orthopedic Surgery

Bio: Head of Department of Orthopaedic Surgery in Graz, Austria. Secretary of the European Musculo-Skeletal Oncology Society (EMSOS). Committed to chordoma research since 2010.

Edward Les, MD, DVM

23 Discovery Ridge Mount SW
Calgary. AB T3H 5G3
Canada



Primary Specialty: Pediatrics

Bio: Pediatric emergency physician in Calgary, Alberta. Clival chordoma survivor, diagnosed 2007. Past board member, Chordoma Foundation.

Norbert Liebsch, MD, PhD

Massachusetts General Hospital
Francis H. Burr Proton Therapy Center
30 Fruit Street Room 138
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Primary Specialty: Radiation Oncology

Bernadette Liegl-Atzwanger, MD

Medical University of Graz
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Dr. Cheng Long

Peking University Third Hospital
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China



Robert Malyapa, MD, PhD

Lead Physician, Proton Treatment
University of Florida Proton Therapy Institute
2015 Jefferson St
Jacksonville, FL 32206-3531

Primary Specialty: Radiation Oncology

Bio: Dr. Malyapa has extensive clinical experience with proton therapy patients. He is the lead physician for the proton treatment of adult patients with cancers of the head and neck, skull base, spine, central nervous system and eye tumors. A radiation oncologist trained at Mallinckrodt Institute of Radiology at Washington University Medical Center in St. Louis, Missouri, Dr. Malyapa is involved in education of proton therapy for head and neck cancers for the particle therapy oncology group. He is an invited speaker and panelist for proton therapy for head and neck tumors at various national and international meetings. In addition to his clinical expertise, he has research experience and training in radiation biology from Hiroshima University in Japan, where he received his Ph.D. His work has appeared in numerous publications, including International Journal of Radiation Oncology Biology Physics, Radiation Research and more.

Peter Loupos, PhD

Senior Director, Partners in Patient Health
Sanofi-Aventis
55 Corporate Dr
Bridgewater, NJ 08807-1265

Bio: I work in an organization within Sanofi called Partners in Patient Health. Our mission is to partner with patients and patient groups to advance science and innovation to find and develop new treatments and cures in areas of unmet needs.

Matthew McCann

Ph.D Candidate, University of Western Ontario
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Canada



Projects: My proposed studies will use a novel mouse model to elucidate specific cellular markers of notochord cells and determine the genetic profile of these notochord cells in both notochord elongation and in their proper development to form the nucleus pulposus. These studies have implications into studying chordoma as these notochord cells become trapped in the vertebral bones, where the reactivation of their developmental genetic programming, most notably the transcription factor brachyury, has been implicated in causing chordoma. Isolating and profiling notochordal cells will aid us in directly differentiating this rare population into chordomas in vitro, which can give greater insights into the disease progression, provided early markers diagnosis, and become a population of cells that can be used for drug screen. To date, my studies have capitalized on a novel notochord-specific Cre knock-in mouse, targeted to the Noto gene which is expressed exclusively in the node and developing notochord from embryonic day (E) 7.5-12.5. Upon mating the Noto-Cre mouse with a ROSA26 conditional reporter mice; all cells of notochord origin can be identified and isolated. This unique genetic model enabled us to perform lineage tracing experiments and track cells of the notochord throughout IVD development, and lineage tracing experiments were carried out to trace cells from the onset of notochord elongation, through distinct stages of nucleus pulposus formation and in skeletally mature mice (2 months old). While these studies provided insights into the formation of the nucleus pulposus, surprisingly they also demonstrated their ability to mark notochord cells in the vertebrae of mature mice and thus become a good model for chordoma. My current studies will use this established Noto-Cre mice to isolate notochord cells at crucial stages of IVD development. By crossing the Noto-Cre mice with conditional ROSA26 fluorescent reporter mice, we will isolate notochord cells directly from the mouse embryo by fluorescence-activated cell sorting (FACS) for phenotypic characterization through microarray analysis and real-time PCR. This profile will provide an insight into the genetic profile of the notochord cells during development, which until now has not been possible using genetic tools. This will allow us to use this genetic profile as baseline to determine how chordoma's actually model development, including brachyury expression but more importantly, discover new genes that can be implicated in chordoma progression. Once a cell population of notochord cells has been isolated, we can further cause these cells to over express key transcription factors in culture and see how they model chordoma progression. Both of these approaches will provide a stable population that can be used to screen for potential drugs targets, which will ultimate aid in chordoma treatment.

Paul Meltzer, MD, PhD

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G. Petur Nielsen, MD

Pathologist
Massachusetts General Hospital
Pathology Associates
55 Fruit street
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Primary Specialty: Anatomic Pathology

Bio: Associate Pathologist, Director of Bone and Soft Tissue Pathology and Electron Microscopy Unit at Massachusetts General Hospital. Associate Professor of Pathology at Harvard Medical School.



Polina Osler

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Mariko Ozu, DVM, MSc

Hiratsuka-Sama, 1-14-2 Kamiosaki
Shinagawa-Ku
Tokyo 1410021
Japan

Bio: 1991 BSc, MSc, Tokyo University of Agriculture and Technology; 1997 DVM, Major Veterinary Physiology; 1997-1998 Univ of Tokyo, Institute of Medical Research, Immunology lab; 1999-2000 Stanford University (Palo Alto CA, US) DVM postdoc; 2000-2001 Ajinomoto Inc. Research Institute; 2001- Various research related office and laboratories on contract; 2010.dec InnoCentive Award (Boston MA, US) for "JC virus animal models" 2011.jun InnoCentive Challenge participant for "Chordoma animal models" 2012.nov Bioinformatics workshop at the Jackson Laboratory (Bar harbor ME, US); 2013- Currently working on a self organized project: "A genome analysis using R statistics".

Projects: I have been developing a series of genome analysis programs using R statistics for distinguishing characteristics and uniqueness of genome sequences of various species. It is just in the midway of developing and I can't say the conclusion yet, but the algorithms we are currently utilizing are useful for cancer genome analysis.



Claudia Palena, PhD

Head, Immunoregulation Group, LTIB
NCI
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Bldg. 10, Room 8B14
Bethesda, MD 20892-0001



Primary Specialty: Tumor immunology

Bio: Dr. Claudia Palena is an Investigator, Head of the Immunoregulation Group in the Laboratory of Tumor Immunology and Biology, National Cancer Institute, NIH, Bethesda. Dr. Palena received her Ph.D. degree in Biochemistry from the National University of Rosario, Rosario, Argentina, in 2000, and subsequently completed a Postdoctoral Fellowship in the Laboratory of Tumor Immunology and Biology, NCI. Dr. Palena has made significant contributions to the field of tumor immunology and cancer immunotherapy, including the identification and characterization of novel tumor-associated antigens, and the use of co-stimulation for optimal activation of human T-cell responses to various tumor antigens. Dr. Palena's current research is focused on the development of novel immunotherapeutic approaches aimed at targeting critical events in tumor progression with the ultimate goal of designing vaccine(s) platform(s) and combinatorial therapies for the prevention and/or treatment of metastases in human cancer.

Deric Park, MD

Assistant Professor
University of Virginia
PO BOX 800212
Charlottesville, VA 22908-0212

Primary Specialty: Neuro-Oncology

Bio: Deric Minwoo Park joined the faculty of the Department of Neurological Surgery at the University of Virginia in April of 2010. He is a board certified neurologist with subspecialty training in clinical neuro-oncology.

Dr. Park received his medical degree from Loma Linda University and completed neurology residency at the University of Chicago, where he was selected by the faculty to serve as Chief Resident. He then trained in clinical neuro-oncology and performed research on paraneoplastic neurologic syndromes at the Memorial Sloan-Kettering Cancer Center with Dr. Jerome B. Posner. This was followed by five years as a Research Fellow at the National Institutes of Health.

Dr. Park provides medical care for patients with brain tumors and is the principal investigator of the Laboratory of Brain Tumor Biology in the Department of Neurological Surgery. He is a member of American Association for Cancer Research, American Society of Clinical Oncology, American Academy of Neurology, International Society for Stem Cell Research, Society for Neuro-Oncology, Society for Neuroscience, and the Scientific Advisory Board of the Chordoma Foundation.



Dilys Parry, PhD

Genetics Consultant
NCI DCEG
6311 Friendship Court
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Primary Specialty: Cancer Genetics

Bio: I have been an investigator in the National Cancer Institute, NIH for more than 30 years. My research focuses on determining the genetic basis and clinical phenotypes of familial cancers. I have been studying chordoma families since 1996. Our research identified T gene duplications as a cause of chordoma in some families. Currently I am Genetics Consultant, Genetic Epidemiology Branch, Division of Cancer Epidemiology and Genetics, NCI.

Shreyas Patel, MD

MD Anderson Center
1400 Holcombe Blvd Unit 450
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Primary Specialty: Cancer Medicine

Bio: Dr. Shreyaskumar Patel is the Medical Director of the Sarcoma Center, a Tenured Professor of Medicine and Deputy Chairman of the Dept. of Sarcoma Medical Oncology at the University of Texas MD Anderson Cancer Center in Houston. He graduated from Baroda Medical College in Baroda, India and did his Medical Oncology training at the Mayo Clinic in Rochester, MN. Dr. Patel has authored or co-authored more than 150 articles in various journals and has been section editor for the Sarcoma Section of Current Oncology Reports since 2000. He has also authored or co-authored 20 book chapters. His clinical research interests include systemic therapy for sarcomas, GISTs and other tumors originating in bone and soft tissues. He is currently President of CTOS, a member the Executive Committee and Chair of the Clinical Research Committee of SARC, and has served as the past Program Chair for CTOS and the Sarcoma Track for ASCO.



Wilco Peul, MD, PhD

Leiden University Medical Center
Department of Neurosurgery
Albinusdreef 2
Leiden 2300 RC
Netherlands

Bio: Chair & professor of neurosurgical department treating patients with chroma of the spine and skull base

Denise Reinke, MS, NP, MBA

President, Sarcoma Alliance for Research through Collaboration
PO Box 406
Ann Arbor, MI 48106-0406

Beate Rinner, PhD

Medical University of Graz
Center for Medical Research
Stiftingtalstraße 24
Graz 8010
Austria



Primary Specialty: Cell Culture

Interests: Our main focus is the culturing and establishment of new chordoma cell lines. Another focus in our research is the culturing and investigation of surrounding fibroblasts.

Projects: We want to establish further chordoma cell lines to test new chemotherapeutic and plant agents. We want to explore the pronounced vacuoles and vesicles in our cell line, through electron microscopy and the isolation of the vesicles.

Resources Available: We are specialist in cell culture and flow cytometry and very interested in any collaboration.

Remco Santegoeds

PhD Student, Maastricht University
Universiteitssingel 50
Maastricht 6229
Netherlands

Slim Sassi, PhD

Research Fellow, Genetics
Harvard Medical School, Mass. General Hospital
185 Cambridge Street
CCIB- CPZN 7-7228
Boston, MA 02114-2790



Bio: I am currently working on a project to decipher complex biological systems. I will attempt to develop an approach to synergize molecular evolution and molecular biology to understand these systems. This approach will involve computational molecular evolutionary methods, high-throughput genetic screening and other classical molecular biology methods.

Susanne Scheipl, MD

Resident at Dept of Orthopaedics and Orthopaedic Surgery
Dept of Orthopaedics and Orthopaedic Surgery, Medical University
of Graz
Autalerstrasse 17a/1
Graz, 8042
Austria



Primary Specialty: Orthopaedics

Projects: I'm participating in an international, interdisciplinary project on chordomas which was initiated in 2007 at the Medical University Graz and is hosted by the Departments of Orthopaedics and the Institute of Pathology. We have been able to cultivate a new well-characterized cell line (Mug_chor1) and have published some work on potential new targets for therapy (IGF-1R, Cox2,...) in Histopathology and Spine 2012. We are particularly interested in the establishment of new model systems (mouse-model, cell lines) and potential targets for therapy (HDACs? - see abstract submitted).

Robert Schoelkopf, PhD

Professor
Yale University
44 Northwood Rd
Madison, CT 06443-1658



Primary Specialty: Physics

Bio: I am a chordoma (thoracic) survivor and a professor of physics at Yale University. I am interested in helping in the research and treatment of chordoma. Given my own history, in which my chordoma was nearly misdiagnosed and mistreated, I am particularly interested in better educating doctors and pathologist to identify this disease better, and in referring patients to the appropriate specialists.

Interests: As a scientist (but not oncologist) and chordoma survivor, I am interested in all aspects of research!

Joseph H. Schwab, MD, MS

Orthopedic Surgeon
Massachusetts General Hospital
55 Fruit St Suite 3800
Boston, MA 02114-2621



Primary Specialty: Orthopedic Surgeon

Bio: Dr. Schwab is a board certified orthopedic surgeon who received his residency training from the Mayo Clinic where he was awarded the P.J. Kelly award for outstanding basic science research. He has sub-specialty fellowship training in spine surgery from The Hospital for Special Surgery and orthopaedic oncology from Memorial Sloan Kettering Cancer Center. Dr. Schwab earned a BA from Miami University in Oxford, Ohio majoring in Religion.

He earned his MD from Chicago Medical School where he was a member of the Alpha Omega Alpha honor society, as well as a Master's degree in Clinical Pathology.

Dr. Schwab recently earned his second Master's degree from Harvard/MIT School of Health sciences and Technology as part of the Clinical Investigator Training Program (CITP). The program is designed to train young investigators in the science of translational research and clinical trials.

Dr. Schwab has an active clinical and research interest in chordomas. As part of the sarcoma service at Massachusetts General Hospital he works closely with his colleagues in orthopedic oncology, medical oncology and radiation oncology in the management of chordomas involving the sacrum and mobile spine. His research has focused on targeting Chondroitin Sulfate Proteoglycan 4 (CSPG4) in chordomas.

Cheryle Seguin, PhD

Assistant Professor
The University of Western Ontario
Dept of Physiology and Pharmacology
London, ON N6A 5C1
Canada



Bio: Dr. Séguin is an Assistant Professor in the Department of Physiology and Pharmacology at The University of Western Ontario and an Associate Scientist with the Lawson Health Research Institute and Children's Health Research Institute. Dr. Séguin obtained her BSc (1999) and MSc (2001) from The University of Western Ontario and her PhD in the area of cell biology and tissue engineering from the University of Toronto (2005). Following this, Dr. Séguin became a postdoctoral fellow with Dr. Janet Rossant at the Hospital for Sick Children in Toronto ON, working in the field of early mammalian development and stem cell biology. In 2009, Dr. Séguin was recruited to The University of Western Ontario where she has established an active research program, centered on understanding stem cell fate and function. Her primary interest is examining cell fate determination within the intervertebral disc and the development of strategies to exploit the role of tissue specific stem cells for spine and skeletal tissue regenerative medicine. Her lab is supported by operating grants from the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, the Canadian Foundation for Innovation, and the Chordoma Foundation. Dr. Séguin is a Canadian Arthritis Network Scholar and member of the Canadian Stem Cell Network.

Sagar Shah

PhD Student
Johns Hopkins University
1550 Orleans St Rm 272
Baltimore, MD 21287-0014

Bio: Sagar R. Shah is a doctoral student in the Department of Biomedical Engineering at Johns Hopkins University School of Medicine. Sagar completed his BS in biological sciences with a minor in mathematical sciences with general and departmental honors in both disciplines at Clemson University in 2006 and was bestowed the university's highest honor, the Norris Medal. Subsequently, Sagar completed his MS in bioengineering at Clemson University in 2007 through a 5-



year BS/MS program. Sagar is a recipient of the National Science Foundation Graduate Research Fellowship. As member of Dr. Alfredo Quinones-Hinojosa's laboratory in the Department of Neurosurgery, Sagar is interested in understanding the systems biology of cancer with an emphasis on understanding developmentally-relevant signaling cascades that are often co-opted by tumors. Sagar is co-mentored by Dr. Andre Levchenko in the Department of Biomedical Engineering.

Projects: Systems Biology of chordoma - particularly focused on the modulation of novel signaling cascades by brachyury. In addition, I am interested in exploring if these mechanisms are used during development and co-opted by other pathological systems.

I-mei Siu, PhD

Instructor
Johns Hopkins University
CRB 2, Room 276
1550 Orleans St.
Baltimore, MD 21231
Primary Specialty: Cancer biology

Josh Sommer

Executive Director
Chordoma Foundation
PO Box 2127
Durham, NC 27701

Primary Specialty: Chordoma

Dempsey Springfield, MD

Department of Orthopaedics
Massachusetts General Hospital
55 Fruit St., Yawkey 3922
Boston, MA 02114-2621

Primary Specialty: Chordoma

Bio: Orthopaedic Oncologic Surgeon involved in the care of patients with Chordoma since 1978.

Projects: I have been involved with the local control for axial and sacral chondromas. I am mainly interested in how to make this procedure less morbid.



Silvia Stacchiotti, MD

Istituto Nazionale dei Tumori, Milan
via Venezian 1
Milan 20133
Italy

Primary Specialty: Sarcoma and Rare Tumors

Bio: A medical oncologist, dr. S. Stacchiotti, works in the Adult Sarcoma Medical Treatment Unit, Cancer Medicine Department, Istituto Nazionale Tumori, Milano, Italy, directed by dr. Paolo G. Casali. Her clinical and research activities focus on rare tumors, especially adult sarcomas, including gastrointestinal stromal tumors (GIST), and uncommon histotypes such as chordoma, alveolar soft



part sarcoma, solitary fibrous tumor and PEComa. She is a member of the Italian Sarcoma Group, a national cooperative group for clinical and translational research on soft tissue and bone sarcomas, and is a member of the EORTC Soft Tissue & Bone Sarcoma Group. She collaborates to the Italian Network on Rare Tumors, a collaborative effort among Italian cancer centers, which tries to exploit distant patient sharing in order to improve quality of care and diminish health migration for rare solid cancers. She is a member of ESMO (European Society for Medical Oncology), Connective Tissue Oncology Society (CTOS) and of ASCO (America Society of Medical Oncology). She has authored more than 40 scientific publications on sarcoma. Born in 1968, dr Silvia Stacchiotti received his medical degree in 1993 in Milan, and trained at the Istituto Nazionale Tumori. She is certified in Clinical Oncology.

Zsolt Szövérfi, MD

National Center for Spinal Disorders
Királyhago 1-3
Budapest 1126
Hungary

Primary Specialty: Spinal tumors

Elena Tamborini, PhD

Via Venezian, 1
Milan 20133
Italy

Bio: Bachelor degree in Biological Sciences, PhD in Applied Genetics. Active in the cancer biology field since 1996, with particular interest on sarcomas. Research grant holder and authors in more than 80 publications in peer reviewed journals. Current research areas of interest are gastrointestinal stromal tumors (GIST) and chordomas. At present, responsible for molecular diagnoses at Fondazione IRCCS Istituto Nazionale dei Tumori of Milan.

Jie Tang, MD

Department of Neurosurgery
Beijing Tiantan Hospital
Beijing 100050
China

Primary Specialty: Skull Base Neurosurgery



Patrick Tarpey, PhD

Senior Research Scientist
The Wellcome Trust Sanger Institute
Wellcome Trust Genome Campus
Hinxton CB10 1SA
United Kingdom

Primary Specialty: Cancer Genomics

Bio: We are interested in analysing the genomes of cancers to unravel the somatic variants which may contribute to cancer progression. Following my PhD, I qualified as a Clinical Molecular Geneticist in London and Cambridge prior to moving to the Wellcome Trust Sanger Institute in 2002 to pursue a research project on X-linked mental retardation (XLMR). This project utilized high-throughput capillary sequencing to screen all genes on the X chromosome in a large cohort of males affected with XLMR. This study was the largest investigation conducted on a Mendelian disease, and resulted in the discovery of over 10 new XLMR genes (~10% of all known XLMR genes) in addition to novel genes underlying nystagmus and female-limited epilepsy. I am now a senior research scientist at the Cancer Genome team in the Sanger Institute. We have used SureSelect exome capture and Illumina sequencing on paired tumour and normal samples, to look for the recurrently mutated genes which may represent novel cancer genes. These investigations recently lead to the identification of the *PBRM1* gene in renal cancer.



Matthias Uhl, MD

University of Heidelberg
Römerstrasse 100
Heidelberg 69115
Germany

Bio: 2000-2007: Studied medicine at University of Nürnberg/Erlangen, Germany. 2007- Have worked in the Department of Radiooncology at the University of Heidelberg (Prof. Debus) and have been a Consultant since 2011.

Madhura Vipra, MSc, PhD

Senior Business Analyst
Optta Systems
A-203, Springfields CHS, DP Road
Kothrud
Pune, India 411038
India

Primary Specialty: Cell Biology

Bio: Madhura has a doctorate in cancer cell biology with her work focused on Epithelial Mesenchymal Transition in Uterine Cervical Cancer. She is currently Chief Product Owner for Bio-IT company (catering to BD Biosciences, USA), where she also heads a team of @ 20, a genome R n D division. She has expertise and special interest in data analysis and management and has worked across, Pharmacogenomics, Toxicogenomics, Biomarkers, Epigenetics, Microarray & NGS Data analysis, Pathways, Gene regulation, Microarray data analysis, Mutations, GWAS, Personalized Genomics & Patent Mining. Madhura, has successfully transformed her interests and vast experience of lab research to cross functional areas such as Bio-IT, Bioinformatics, Pharma and Health Informatics and Bio-IPR. The journey had been fascinating allowing her to gather expertise in domain, project management, execution, requirement and gap analysis, and business development. Madhura has strong analytical and problem solving skills and has worked in research, academia, and industry.

Carmen Vleggeert-Lankamp, MD, PhD

Neurosurgeon
Leiden University Medical Centre
P.O. Box 9600, L1-Q
Leiden 2300 RC
Netherlands

Primary Specialty: Neurosurgery

Bio: Carmen Vleggeert-Lankamp is a neurosurgeon from Leiden, the Netherlands. She is specialized in surgery of the spine. She is the head of the spine research department of the neurosurgical department in the Leiden University Hospital. She coordinates the study of chordomas of the spine in the Netherlands in collaboration with pathology, radiology and oncology.



Liang Wang, MD

Attending Neurosurgeon
Beijing Tiantan Hospital
6 Tiantan Xili
Beijing 100050
China

Primary Specialty: Skull Base Tumors

Interests: the development of treatment in chordoma



Markus Warmuth, MD

President and CEO
H3 Biomedicine
300 Technology Sq
Ste 5
Cambridge, MA 02139-3520

Primary Specialty: Embryonic Development

Bio: Dr. Markus Warmuth joined H3 Biomedicine as Chief Scientific Officer in August 2011 and became President and Chief Executive Officer on October 1, 2011. Markus brings significant experience in cancer biology, drug discovery and clinical oncology to H3. During his career as a pharmaceutical industry research executive, he has successfully built and shaped oncology research groups and portfolios. Prior to joining H3, Markus was Head of Oncology Drug Discovery for the Novartis Institute for Biomedical Research (NIBR), Cambridge (U.S.) Site. There, he oversaw a significant part of NIBR's global oncology drug discovery portfolio from target discovery to clinical development. Markus studied and received his doctorate in Medicine from the Ludwig-Maximilians-University of Munich, Germany. He trained in Internal Medicine and Oncology at the University of Munich. From 1998 to 2002, he had an appointment as a principal scientist with the "Clinical Cooperation Group Signaling" at the German National Research Center of Environment and Health (GSF), where he studied the mechanism of action of and resistance to multiple small molecule kinase inhibitors in leukemia and lymphoma. From 2002 to April 2008, Markus worked at the Genomics Institute of the Novartis Research Foundation (GNF), San Diego, where he was Director of Kinase Biology, Head of the Oncology Pharmacology Program and a member of GNF's Research and Drug Discovery Steering Committee.



Menghang Xia, PhD

NIH Chemical Genomics Center
9800 Medical Center Dr
#3005
Rockville, MD 20850-6386



Bio: Dr. Menghang Xia has been a group leader of cellular toxicity and signaling at the NIH Chemical Genomics Center (NCGC, now a part of National Center for Advancing Translational Sciences). Dr. Xia and her research team are currently focused on the target-specific and mechanism-based pharmacological and toxicological studies. Dr. Xia received her Ph.D in pharmacology and toxicology from the State University of New York at Buffalo and did her postdoctoral training at the University of California at San Francisco. Prior to joining NCGC, Dr. Xia identified and validated several targets for drug development as a senior scientist at Merck Research Lab.

Youssef Yakkioui, MD

Maastricht University Medical Center
Burg Lespinassestraat 1 C05
Maastricht 6226 HN
Netherlands

Bio: A Neurological Surgery Resident, PhD student studying chordoma.
Projects: DNA methylation and proteomics in chordoma



Yoshiya Yamada, MD, FRCPC

Associate Attending Radiation Oncologist
Memorial Sloan Kettering Cancer Center
1275 York Ave
New York, NY 10065-6007

Primary Specialty: Radiation Oncology

Bio: Associate Attending Radiation Oncologist, IGRT Fellowship Director, Department of Radiation Oncology, Memorial Sloan Kettering Cancer Center.

Interests: The use of high dose stereotactic radiosurgery for chordomas of the spine.

Projects: Multi center prospective study of preoperative spine radiosurgery

Resources Available: Spine radiosurgery, spine dural brachytherapy, high dose rate spine brachytherapy, image guided radiation

Takehiko Yamaguchi, MD, PhD

Associate Professor
Jichi Medical University
3311-1 Yakushiji
Shimotsuke, Tochigi 329-0498
Japan

Primary Specialty: Pathology

Bio:

2008- Associate Prof., Depart. of Pathology, Jichi Medical University
2005-2008 Associated Prof., Depart. of Surgical Pathology, Sapporo Medical University
2002-2005 Assistant Prof., Depart. of Pathology, Koshigaya Hospital, Dokkyo Medical University

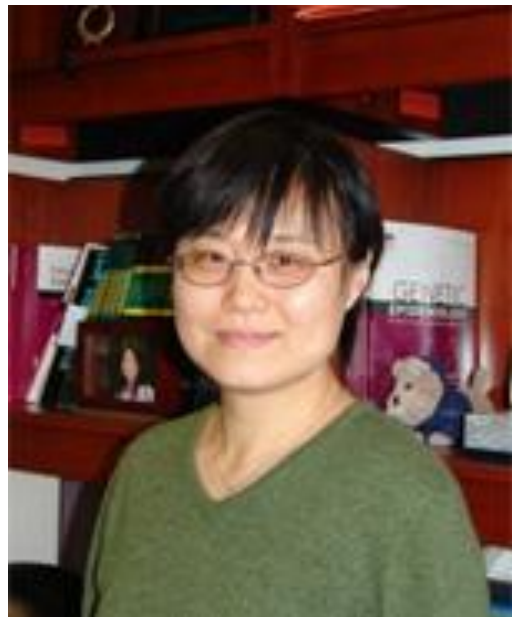
Interests: Surgical pathology of chordoma and benign notochordal cell tumor (BNCT) Radiologic and histologic differential diagnosis between chordoma and BNCT

Rose Yang, PhD, MPH

Investigator
DCEG/NCI
6120 Executive Blvd, Rm 7014
Rockville, MD 20852-4906

Primary Specialty: Genetic Epidemiology

Bio: Dr. Yang received a Ph.D. in physiology from the Lombardi Cancer Center, Georgetown University in 1999 and a M.P.H. in epidemiology from Johns Hopkins University School of Public Health in 2003. She joined the Genetic Epidemiology Branch (GEB) in 2000 as a fellow, and became a tenure track investigator in 2006. Her research interests include the genetics of familial cutaneous malignant melanoma & chordoma and molecular heterogeneity of breast cancer.



Interests: Identifying susceptibility genes for familial cancers including cutaneous malignant melanoma/dysplastic nevi syndrome, chordoma, and nasopharyngeal carcinoma using genetic linkage and association analyses. Assessing etiologic heterogeneity of breast cancer using Tissue Microarray analysis of molecular markers involved in hormone-mediated pathways.

Stephen Yip, MD, PhD

Clinical Assistant Professor/Consultant Pathologist
BC Cancer Agency
855 12th Ave W
Vancouver, BC V5Z 1M9
Canada

Primary Specialty: Neuropathology

Bio: Stephen Yip, M.D., Ph.D. is a board-certified neuropathologist clinically appointed at Vancouver General Hospital and is an assistant professor of medicine at the University of British Columbia. He is also trained in molecular genetics pathology and has an active research interest in brain tumour and sarcoma genomics. He is very interested in the practical adoption of next generation sequencing or NGS technology in clinical pathology and as an accessible investigative tool in research. Dr. Yip completed his combined M.D.-Ph.D. training at the University of British Columbia and completed four years of neurosurgical training at VGH prior to switching to neuropathology. He obtained his FRCPC certification in 2006 and then completed two years of research fellowship with Dr. David Louis at the Massachusetts General Hospital. He then underwent an additional year of molecular genetic pathology training in Boston prior to returning to Vancouver. Initially he performed mainly neuropathological consultations of brain tumour cases at the BC Cancer Agency and has since moved to Vancouver General Hospital to take on full clinical duties in neuropathology. He maintains his research at BCCA and also works closely with Drs David Huntsman and Marco Marra on various next generation sequencing projects.

