

## Curriculum Vitae – Edwin Choy

### Education:

1993	BS	Molecular Biophysics and Biochemistry	Yale University
2000	MD, PhD	Medicine and Cell Biology (Thesis Advisor: Mark Philips MD, Professor of Medicine)	New York University School of Medicine

### Postdoctoral Training:

2000-2001	Intern	Internal Medicine	Massachusetts General Hospital
2001-2003	Resident	Internal Medicine	Massachusetts General Hospital
2003-2005	Fellow	Hematology Oncology	Dana Farber Cancer Institute / Massachusetts General Hospital /Brigham and Women's Hospital
2004-2007	Postdoc	Program in Medical Genetics (PI: David Altshuler MD PhD, Professor of Medicine)	Broad Institute of Harvard and Massachusetts Institute of Technology

### Faculty Academic Appointments:

2005-2011	Instructor	Medicine	Harvard Medical School
2011-2019	Assistant Professor	Medicine	Harvard Medical School
2019	Associate Professor	Medicine	Harvard Medical School

### Appointments at Hospitals/Affiliated Institutions:

2005-present	Assistant in Medicine	Department of Medicine, Division of Hematology Oncology	Massachusetts General Hospital, Boston, MA
2005 – 2007	Consulting Oncologist	Department of Medicine	Youville Hospital, Cambridge, MA

### Other Professional Positions:

2007-2012	Associate Faculty	MGH Center for Human Genetic Research (CHGR)	
2009-present	Consultant	Best Doctors, Inc.	1 hour a month

2009-present	Consultant	Partners Online Specialty Consultations Guidepoint	1 hour a month
2010-2012	Consultant	Global	
2010,2012, 2015	Scientific Advisory Board Meeting	Amgen	
2011	Consultant	Biomed Valleys	
2011	Scientific Advisory Board Meeting	Sanofi Aventis	
2013-present	Scientific Advisory Board Meeting	American Angiosarcoma Society	1x a year
2013	Consultant	Pfizer	
2014	Scientific Advisory Board Meeting	Bayer	
2014	Medical Advisory Board	NPS Pharmaceuticals	
2014-present	Tumor Board, Member Expert Panel	BOTSOGO (Botswana Oncology Global Outreach	3x a year
2015, 2016	Expert Oncology Panel	EMD Serono	
2016, 2017	Scientific Advisory Board Meeting	Daiichi Sanyo, Inc.	
2016	External Safety Board	Shire	
2016-present	Consultant	MGPO Grand Rounds, Remote Second Opinion	1 hour a month
2016-2018	Halaven Steering Committee	Esai Inc.	1x a year
2017	Scientific Advisory Board Meeting	ImmunoDesign	

### Major Administrative Leadership Positions:

#### Local

2007-present	Director of Sarcoma Clinical Research	Massachusetts General Hospital, Division of Hematology Oncology
2011 – present	Clinical Director of Sarcoma Oncology	Massachusetts General Hospital, Division of Hematology Oncology

#### National

2011- 2018	Clinical Trial Leader for SARC's SPORE Project #1	NIH
2011 – 2018	Core Committee Member for SARC's NIH-SPORE group	NIH
2012 – present	Medical Co-Chair for RTOG-COG Clinical Trial ARST 1321	Radiation Therapy Oncology Group
2015-present	Chair of the Data Safety and Monitoring Board for Clinical Trial NCT02282917, An Exploratory Evaluation of AR-42 Histone	NIH

2015-present	Deacetylase Inhibitor in the Treatment of Vestibular Schwannoma and Meningioma Chair of the Data Safety and Monitoring Board for Clinical Trial NCT02307916, An Open-label, Dose Response Study to Evaluate the Safety and Optimal Biologic Dose of FGF-1 in Subjects With Chronic Non-Healing Tympanic Membrane Perforations (TMPs)	NIH
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## Committee Service:

### Local

2003, 2011	Internship Selection Committee	MGH, Department of Medicine
2008 - 2013	Scientific Research Committee	Dana Farber / Harvard Cancer Center
2012	Internship Application Interview Committee	MGH, Department of Medicine
2012 - 2015	MGPO Managed Care and Contracting Committee	Massachusetts General Physicians Organization
2013	Partners Center for Drug Policy, Contributor	Partners Healthcare
4/2013 – 2015	MGH Cancer Center Patient Experience Committee	MGH Cancer Center
7/2013 – 2015	MGH Cancer Center Subcommittee on Patient Education	MGH Cancer Center
2013-2017	Selection Committee Member for “The One Hundred”	MGH Cancer Center
2014-present	Hematology Oncology Fellowship Selections Committee	Dana Farber / MGH Fellowship Program in Hematology Oncology
2014, 2015	EPIC Redesign Committee for Sarcoma	Partners eCare
2016 – 2020	Committee on Substance Use Disorders	MGH Cancer Center
2016	Oncology Pharmacy Budget Committee	MGH Cancer Center
2021	Anti-Racism Task Force – Review of Medical School Admissions	Harvard Medical School

### National

2010-present	Member, Clinical Trials Group	NRG – National Surgical Adjuvant Breast and Bowel Project, The Radiation Therapy Oncology Group and the Gynecologic Oncology Group
2012, 2014, 2015	Member of the Review Board for the – Clinical Scholars and Young Investigators Award	Alliance for Clinical Trials in Oncology Foundation

2014, 2015	Member of the RO1 review board	FDA-Office of Orphan Products Development (OOPD)
2016-present	Guidelines reviewer for Partners in Health	Partners in Health
2018-present	Panel member for NCCN Soft Tissue Sarcoma Guidelines	National Comprehensive Care Network
2018-2020	SARC Committee on Clinical Trials	Sarcoma and Research in Collaboration (SARC)
2021	National Search Committee for Editor in Chief Position	Cancer

### **Professional Societies:**

2003-present	American Society of Clinical Oncology	
	2003-2005	Associate Member
	2005-present	Member
2007-present	Connective Tissue Oncology Society	
2007-present	Sarcoma Alliance in Research and Collaboration	
2009-2015	Radiation Therapy Oncology Group	
2015-present	NRG (National Surgical Adjuvant Breast and Bowel Project (NSABP), the Radiation Therapy Oncology Group (RTOG), and the Gynecologic Oncology Group (GOG))	
2010-present	Children's Oncology Group	

### **Grant Review Activities:**

2009 – 2015	Grants Committee, Grants Reviewer	Liddy Shriver Sarcoma Initiative
2012	Grants Committee, Grants Reviewer	Institut National du Cancer – INCa Grants reviewer
2013	Grants Committee, Grants Reviewer	Reliable Cancer Therapies, SUI
2014, 2015	RO1 Reviewer	Food and Drug Administration
2016, 2017, 2018, 2019	Institutional Review Grants, Grants Reviewer	American Cancer Society

### **Editorial Activities:**

#### **Ad hoc Reviewer**

*Pharmacogenetics and Genomics*  
*Expert Review of Anticancer Therapy*  
*Cancer*  
*Electronic Sarcoma Update Newsletter*  
*The Oncologist*  
*BMC Cancer*  
*Neurosurgery*  
*F1000*  
*Pharmacogenomics*  
*Cancers*  
*Future Oncology*  
*Medical Oncology*  
*Clinical Advances in Hematology & Oncology*  
*Journal of Surgical Oncology*  
*Journal of Health & Medical Informatics*  
*PLoS ONE*  
*Expert Opinion on Therapeutic Targets*  
*Expert Review of Anticancer Therapy*  
*Current Cancer Drug Targets*  
*Expert Review of Clinical Pharmacology*  
*Sarcoma*  
*Molecular Cancer Therapeutics*  
*Annals of Oncology*  
*Expert Review of Proteomics*  
*Cancer Gene Therapy*  
*Cancer Research*  
*Annals of Cancer Research*  
*Sarcoma Research International*  
*Neuro-Oncology*  
*Cancer Biology & Research*  
*Critical Review in Oncology/Hematology*  
*Case Report in Oncological Medicine*  
*Journal of Cancer Biology & Research*  
*Clinical Investigation*  
*Expert Review of Proteomics*  
*Rare Cancer and Therapy (RATH)*  
*Medical Epigenetics*  
*Austin Journal of Sarcoma*  
*Oncotarget*  
*Advance in Therapy*  
*Therapeutics and Clinical Risk Management*  
*Molecular Cancer Therapeutics*  
*Oncogenesis*  
*Clinical Cancer Research*  
*JCO Precision Oncology*

## Other Editorial Roles

2010-present	Associate Faculty Member	F1000
2012	Guest Editor for the Special Issue in Soft Tissue and Bone Sarcoma	Cancers
2014	Guest Editor for “Osteosarcoma: Symptoms, Diagnosis, and Treatment Options”	NOVA
2014-present	Editorial Board Member	The Oncologist
2014-present	Editorial Board Member	Sarcoma Research – International
2015 – present	Editorial Board Member	International Archives of Translational Medicine (IATM).
2015-present	External Expert Reviewer	Indian Pediatric Oncology Group (IPOG)
2015 – present	Editorial Board Member	Peertechz Journal of Orthopedics and Rheumatology
2015 – present	Editorial Board Member	Annals of Cancer Research
2015 – present	Editorial Board Member	International Journal of Hematology and Therapy
2016 – present	Editorial Board Member	Annals of Hematology and Oncology
2016 – present	Editorial Board Member	Clinics in Oncology for their journals in Sarcoma and Paediatric Cancers
2016 – present	Editorial Board Member	International Journal of Cancer Research and Therapy
2016-present	Editorial Board Member	Journal of Surgical Oncology and Clinical Practice
2016-present	Editorial Board Member	Scientific Pages of Orthopedics and Rheumatism
2017 – present	Expedited Review Board	Journal of Clinical Oncology
2017 – present	Chief Editor on Bone and Soft Tissue Cancers	Medscape

## Honors and Prizes:

2009	Partners in Excellence Award	Massachusetts General Hospital and Partners Healthcare	Clinical Excellence
2009, 2010	The One Hundred Honoree	Massachusetts General Hospital Cancer Center	For significant contributions to advancing the fight against cancer

2012	Chawla-Rosenfeld Symposium Honoree		
2013	MGPO nominee for the “2013 Brian McGovern Award for Clinical Excellence”	Massachusetts General Physicians Organization Physician Recognition Dinner	Clinical Excellence

## **Report of Funded and Unfunded Projects**

### **Funding Information:**

#### **Past**

1997-2000	Compartment Specific Signaling of Ras NIH/5R01GM055279-11 Graduate Student PI: Mark Philips The major goal was to study the molecular cell biology pathways in cancer. This grant funded my graduate school work in identifying that Ras proteins transit through the endoplasmic reticulum.		
2004-2007	Genetic Analysis of In Vitro Drug Response NIH/NCI 5T32CA71345-08 Investigator PI: Bruce Chabner The major goal was to identify molecular genetic markers associated with drug response. This grant funded my postdoctoral work with David Altshuler in studying chemotherapy genetics in HapMap cell lines.		
2005-2007	Genotype-Phenotype Correlations in HapMap Cell Lines Broad Institute: SPARC Award Investigator The major goal was to characterize the genome of cancer cell lines and explore functional consequences. This grant provided funds for reagents and technicians to perform this project		
2007-2009	07-025, Phase II Trial of Perifosine for Chemo-Insensitive Sarcomas Keryx Site-PI \$82,455 Direct Costs This clinical trial studied the efficacy of perifosine in patients with chemoresistant sarcomas. I served as the MGH site investigator for this multiinstitutional industry sponsored study.		
2007-2008	07-124, Phase II study of Apomab for Chondrosarcoma and Synovial Sarcoma. Genentech Site-PI \$193,357 Direct Costs This clinical trial studied the safety and efficacy of apomab in treating patients with metastatic chondrosarcoma and synovial sarcoma. I served as the MGH site investigator for this multiinstitutional industry sponsored study		
2007-2009	07-251, A Pivotal Trial to Determine the Efficacy and Safety of AP23573 when Administered as Maintenance Therapy to Patients with Metastatic Soft-Tissue or Bone Sarcomas Merck / Ariad		

Site-PI \$191,406 Direct Costs  
This randomized phase III clinical trial sought to compare maintenance AP23573 to placebo in patients with sarcoma responding to chemotherapy. I served as the MGH site PI for this industry sponsored multiinstitutional study.

2007-2011 Sarcoma Alliance for Research and Collaboration  
07-168, Phase II Trial of Dasatinib in Advanced Sarcoma  
PI \$66,000 Direct Costs  
This was a SARC-sponsored study of dasatinib in patients with a variety of sarcoma subtypes. I was the PI at the Dana Farber Harvard Cancer Center overseeing this research at DFCI and MGH

2008-2011 07-329, Phase II Study of ARQ 197 in Patients with Microphthalmia Transcription Factor Associated Tumors.  
Arqule  
Site-PI \$201,960 Direct Costs  
This clinical trial studied the safety and efficacy of ARQ197 in patients with sarcomas harboring MITF pathway abnormalities. I enrolled patients with clear cell sarcoma and alveolar sarcoma as the MGH site PI for this industry funded investigator initiated study.

2008-2011 07-309, Phase Ib/2 Study of AMG655 in combination with doxorubicin for the first-line treatment of locally advanced or metastatic soft tissue sarcoma  
Amgen  
Site-PI \$276,220 Direct Costs  
This early phase clinical trial sought to understand the role of AMG655 when given with doxorubicin in patients with advanced sarcomas. I served as the MGH site investigator for this industry sponsored study

2008-2011 07-314, Phase II Study of XL820 in Subjects with Advanced Gastrointestinal Stromal Tumors.  
Exelixis  
Site-PI \$181,990 Direct Costs  
This clinical trial sought to identify the safety and efficacy profile of XL820 in patients with imatinib resistant gastrointestinal stromal tumors. I served as the MGH site investigator for this industry funded clinical trial.

2008-2011 08-048, Phase II Study of AMG479 in Relapsed or Refractory Ewing's Family Tumors and Desmoplastic Small Round Cell Sarcoma.  
Amgen  
Site-PI \$27,453 Direct Costs  
This clinical trial sought to identify the safety and efficacy profile of AMG479 in patients with Ewing sarcoma and desmoplastic small round cell sarcomas that have progressed on at least one prior line of chemotherapy. I served as the MGH site investigator for this industry funded clinical trial.

2008-2011 08-178, Phase III, randomized, double blind, placebo-controlled, multi-center study evaluating the efficacy and safety of IPI-504 in patients with metastatic and/or unresectable GI stromal tumors following failure of at least imatinib and sunitinib.  
Astra-Zeneca  
Site-PI \$3,330 Direct Costs  
This randomized phase III clinical trial sought to identify the superiority to placebo of IPI-504 in patients with imatinib and sunitinib resistant gastrointestinal stromal tumors. I served as the MGH site investigator for this industry sponsored clinical trial.

2009-2011 07-351, Phase II of R1507, an IGF1R-1 Ab, for Recurrent/Refractory Sarcomas



- Roche / SARC  
Site-PI \$142,282 Direct Costs  
This was a SARC-sponsored study of an IGFR-1 inhibitor in patients with Ewing sarcoma. I was the MGH site PI overseeing this research at MGH.
- 2009-2011 KL2 Medical Research Investigator Training (MeRIT) Grant  
Harvard Catalyst  
PI \$383,843 Direct Costs  
This early career support grant supported my transition into a junior faculty member in the oncology division. I used these funds for salary support and materials to study the role of HDAC inhibition in patients with advanced sarcomas.
- 2008-2012 08-300, A Randomized, Multicenter, Phase III Trial of Trabectedin (Yondelis) versus Doxorubicin-based Chemotherapy as First-Line Therapy in Patients with Translocation-Related Sarcomas (TRS)  
Johnson and Johnson  
Site-PI \$12,101 Direct Costs  
This was a SARC-sponsored study of dasatinib in patients with a variety of sarcoma subtypes. I was the PI at the Dana Farber Harvard Cancer Center overseeing this research at DFCI and MGH.
- 2009-2014 09-101 A Phase 1/2, Multicenter, Dose-Escalation Study to Determine the Safety, Efficacy and Pharmacokinetics of TH-302 in Combination with Doxorubicin in Patients with Advanced Soft Tissue Sarcoma  
Threshold Pharmaceuticals  
Site-PI \$26,271 Direct Costs  
This industry sponsored clinical trial studied the safety and efficacy of TH302 in patients with advanced sarcoma. This study provided preliminary data for the pivotal phase III registration study that followed. I served as the MGH site investigator for this multiinstitutional clinical trial.
- 2009-2015 09-352, A Phase I/II Study of PCI-24781 with Doxorubicin for Patients with Advanced Sarcoma  
Pharmacyclics  
PI \$246,294 Direct Costs  
This early phase clinical trial studied the safety, efficacy, and pharmacodynamics of the HDAC inhibitor PCI24781 in patients with metastatic sarcoma. I was the overall study PI for this study conducted at DFCI and MGH.
- 2010-2012 Identification of a microRNA signature in multidrug resistant sarcoma patients  
InterRNA Technologies  
Co-investigator PI: Zhenfeng Duan  
We used expression profiling of microRNAs to determine an expression pattern that identifies chemoresistance in sarcoma. I was involved in designing experiments that measured microRNA expression levels in these sarcoma samples.
- 2010-2015 Combinatorial-designed nano-platforms to overcome tumor drug resistance.  
NIH/NCI 1UO1CA151452  
Sub-contractor PI: Amiji Mansoor, Zhenfeng Duan  
This was a multi-site grant that funded laboratory work that studied a novel drug delivery platform. We used this grant to package chemotherapy into dextran-based nanoparticles to treat chemoresistant sarcoma cell lines.
- 2011-2013 Evaluation of the miRNA-1 as potential therapeutic target for treatment in chordoma  
Chordoma Foundation

- Co-investigator PI: Zhenfeng Duan  
The major goal was to investigate miRNA-1 and its role in chordoma proliferation. I worked with Dr. Duan in designing experiments identifying miRNA-1 as a possible treatment target.
- 2012-2015 Clinical Research Scholar  
MGH Cancer Center  
PI: \$25,000
- 2012-2018 Specialized Programs of Research Excellence (SPORE)  
NIH/NCI 1P50CA142507-01A1  
Co-investigator PI – Raphael Pollock  
The major goal is to advance clinical research and correlative scientific studies in sarcoma therapies. I used this funding to study HDAC inhibition in patients with chemo resistant leiomyosarcoma.  
The major goal was to study the role of CDK11 in osteosarcoma proliferation. I worked with Dr. Duan in designing experiments that showed blocking CDK11 can be antiproliferative in osteosarcoma cell lines.  
miR-15b (miRNA-15b) delivery to reverse multidrug resistance in human osteosarcoma
- 2013-2014 Sarcoma Foundation of America  
Co-investigator PI: Zhenfeng Duan  
We established chemoresistant cell lines in osteosarcoma and tested novel ways to deliver miRNA-15b to osteosarcoma cells. I was involved in designing experiments that showed miRNA-15b can block osteosarcoma cell proliferation.
- 2009-2018 09-103, An Open-label, Multi-center, Phase 2 Study of Denosumab in Subjects with Giant Cell Tumor of Bone.  
Amgen  
PI \$28,001 Direct Costs  
The major goal is to investigate the role of denosumab in patients with advanced giant cell tumor of bone. This study led to FDA approval for using denosumab in this disease and we continue to study long term effects and safety profiles for this drug.
- 2011-2018 11-136: A randomized trial of eribulin vs. dacarbazine in patients with liposarcoma or leiomyosarcoma.  
Esai  
PI \$21,899 Direct Costs  
This industry sponsored multiinstitutional trial compared eribulin with dacarbazine in patients with advanced sarcomas. This study led to FDA approval of eribulin in treating patients with metastatic liposarcoma.  
The major goal is to advance clinical research in osteosarcoma and cancer therapies. We used this funding to support a variety of osteosarcoma research projects, including clinical trials support, tumor DNA sequencing, and study osteosarcoma cell lines.
- 2014–2019 14-127, A randomized phase III study of aldoxorubicin in patients with metastatic sarcoma.  
CytRx  
DFHCC Study PI \$20,096 Direct Costs  
This clinical trial seeks to establish a role for using aldoxorubicin with chemotherapy in patients with metastatic soft tissue sarcoma. I am the DFHCC PI of this study.
- 2012-2018 11-470, A Phase II Study of Olaparib in Patients with Recurrent/Refractory Ewing's Sarcoma  
Amgen

	<p>PI Study drug supply</p> <p>The major goal is to advance clinical research in refractory Ewing's sarcoma and cancer therapies by understanding the role of PARP inhibition. I am the overall study PI and sponsor for this study that is being conducted at St. Jude's Hospital, Boston Children's Hospital, DFCI, and MGH.</p> <p>This fund was used to pay for clinical trial costs that exceeded sponsor support and other laboratory and clinic based research activities.</p>
2015–2020	<p>15-204: A randomized study of doxorubicin with olaratumab in patients with advanced soft tissue sarcomas.</p> <p>Eli Lilly</p> <p>MGH site PI \$35,688 Direct Costs</p> <p>This is a national multi-institutional phase III randomized study to follow-up on the FDA approved olaratumab in its role when given with doxorubicin in patients with newly metastatic sarcoma. I am the site PI at MGH overseeing patient enrollment and conduct of the study at MGH.</p> <p>The major goal is to investigate the role of nilotinib in patients with chordoma. I was the overall study PI for this investigator-initiated clinical trial.</p>
2016–2021	<p>16-171: A phase 2-3 multicenter study of selinexor in dedifferentiated liposarcoma</p> <p>Karyopharm</p> <p>MGH site PI \$31,560 Direct Costs</p> <p>This is a national multi-institutional study trying to determine the safety and efficacy of selinexor in patients with dedifferentiated liposarcoma. I am the site PI at MGH overseeing patient enrollment and conduct of the study at MGH.</p>
2015-2018	<p>15-273: This is an investigator initiated, SARC sponsored clinical trial testing mocetinostat with gemcitabine in patients with chemo resistant leiomyosarcoma</p> <p>Astra Zeneca</p> <p>Overall Study PI \$10,763 Direct costs</p> <p>I am the overall study PI for this nationally run multiinstitutional clinical trial.</p>
2016–2021	<p>15-580: A randomized study of Atezolizumab with or without CMB305 in sarcomas expressing NY-ESO-1.</p> <p>ImmunoDesign</p> <p>DFHCC PI \$25,697 Direct Costs</p> <p>This is a national multiinstitutional industry sponsored study looking at immunotherapy for patients with synovial sarcoma or myxoid liposarcoma. I am the DFHCC PI for this study.</p>
2017–2021	<p>17-233: A study of Ribociclib and Everolimus in patients with liposarcoma or leiomyosarcoma.</p> <p>Fox Chase Cancer Center</p> <p>MGH site PI \$16,921 Direct Costs</p> <p>I am the site PI at MGH overseeing patient enrollment and conduct of the study at MGH.</p>
2017–2022	<p>17-365: A study of pembrolizumab with XRT in patients with soft tissue sarcoma.</p> <p>SARC</p> <p>MGH site PI \$9,000 Direct Costs</p> <p>This national multi-institutional study seeks to find a role for pembrolizumab therapy in patients being treated with radiation for sarcoma. I am the site PI at MGH overseeing patient enrollment and conduct of the study at MGH.</p>

**Current**

2007-2024	<p>Molecular Characterization of Sarcomas  Jennifer Hunter Yates Foundation  PI \$56,000 Direct Costs  The major goal is to characterize molecular signatures in sarcoma and cancer therapies. We used this funding to sequence tumor DNA in tumor samples collected for cohorts of patients with osteosarcomas and chordomas.</p>
2009-2024	<p>Kenneth Stanton Foundation  Osteosarcoma Research at MGH  Co-PI \$75,000 Direct Costs  The major goal is to advance clinical research in osteosarcoma and cancer therapies. We used this funding to support a variety of osteosarcoma research projects, including clinical trials support, tumor DNA sequencing, and study osteosarcoma cell lines.</p>
2010-2024	<p>Cassandra Moseley Berry Sarcoma Fund  Cassandra Moseley Berry Sarcoma Fund  PI \$100,000 Direct Costs  This is a patient supported research fund to support osteosarcoma research at MGH. This fund was used to pay for clinical trial costs that exceeded sponsor support and other laboratory and clinic based research activities.</p>
2011-2024	<p>2011A053538 This is a patient supported research fund to support liposarcoma research at MGH.  Jeffrey Allen Guyer Fund  PI \$95,000 Direct Costs  This fund was used to pay for clinical trial costs that exceeded sponsor support and other laboratory and clinic based research activities.</p>
2011-2023	<p>11-072: A Phase I Study of Nilotinib with XRT in Patients with High Risk Chordoma  Novartis  PI \$86,000 Direct Costs  The major goal is to investigate the role of nilotinib in patients with chordoma. I was the overall study PI for this investigator-initiated clinical trial.</p>
2014-2025	<p>13-115, A phase II clinical trial of Olaparib with irinotecan and/or temozolomide in patients with Ewing sarcoma.  Astra Zeneca  Overall Study PI \$5,158 Direct Costs  This clinical trial seeks to establish a role for using olaparib with chemotherapy in patients with Ewing sarcoma. I am the overall study PI and sponsor of this study.</p>
2016–2025	<p>This is a patient supported research fund to support osteosarcoma research at MGH  Amy Chase McMahon Sarcoma Fund  PI \$20,000 Direct Costs  This fund was used to pay for clinical trial costs that exceeded sponsor support and other laboratory and clinic based research activities.</p>

## **Report of Local Teaching and Training**

### **Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs):**

2007-present	Teaching Discussions of Sarcoma Oncology Curriculum	12 hours a year
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2007-present	MGH Oncology Fellows Invited sarcoma expert for a teaching session for fellows in oncology, MGH Medical Oncology Fellows	MGH One hour seminar every 6 months
2007-present	Invited sarcoma expert for a teaching session for orthopedic fellows	MGH
2009-2011	MGH Orthopedic Oncology Fellows Invited expert for a teaching session for senior residents in medicine	One hour seminar every 4 months MGH
	MGH Residents	One hour seminar per year

### **Clinical Supervisory and Training Responsibilities:**

2007-present	Supervise oncology fellows in a multidisciplinary clinic for sarcoma and connective tissue oncology	2 hours a week
11/2007 – 6/2011	Attending Physician for house staff in oncology rotation MGH	160 hours a year
2009	Clinical Supervisor, Shadowing of Visiting Oncologist from Melbourne Australia	3 hours a week
2010 –present	Direct sarcoma medical oncology clinic MGH	16 hours a week
12/1/2008-present	Consult attending on teaching consult service for oncology fellows MGH	20 hours a year
2009-present	Supervise and teach medical residents as they rotate on outpatient oncology elective MGH	3 hours a week
2012-2014	Inpatient Attending Physician for house staff “Blue Team” in oncology rotation MGH	160 hours a year
2016-present	Inpatient Attending Physician for house staff rotating on Sarcoma In-Patient Service	20 hours a year

### **Laboratory and Other Research Supervisory and Training Responsibilities**

2012-2015	Supervising Lab Technician	2 hours a week
2013-present	Research co-mentor for clinician investigator in sarcoma oncology	4 hours a week
2017-2018	Research mentoring DOM Resident	2 hours a month

### **Other Mentored Trainees and Faculty:**

2013-present	Gregory Cote, MD, PhD/Assistant Professor, MGH.
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Mentoring Role: Served as primary clinical mentor and research co-mentor  
 Accomplishments: Dr. Cote was recently promoted to Assistant Professor and won a K-award to support early career development. 4 hours a month.

2017-2018 Arielle Medford, MD / Medical Resident, MGH  
 Mentoring Role: Served as research mentor  
 Accomplishments: First Author publication

### **Local Invited Presentations:**

2007 Advances in Sarcoma Oncology / Cancer Center Grand Rounds  
 MGH

2008, 2009 Introduction to Sarcoma Research  
 MGH Protocols Office

2009 A 23 year old man with cough, hoarseness, and fever / Presentation and case discussion  
 MGH Cancer Center

2009 Treating an incarcerated patient / MGH Schwartz Rounds  
 MGH

2010 Update in GIST and Sarcomas / DOM Grand Rounds  
 MGH

2012 Management of Gastrointestinal Stromal Tumors  
 MGH Pediatric Tumor Board

2015 A 28 Year Old Woman with Back Pain and a Lesion in the Lumbar Spine  
 MGH Cancer Center

2017 Olaratumab as sarcoma therapy / Case presentation  
 Partners Formulary Review Committee, MGH Cancer Center

### **Report of Regional, National and International Invited Teaching and Presentations**

#### **Regional**

2008 Visiting Oncologist / Tumor Boards Discussant  
 Emerson Hospital, Emerson MA

2010 Visiting Expert Symposium / Invited oral presentation  
 University of Connecticut Cancer Center, Storrs, CT

2014 Update on GIST and Sarcoma Oncology / Invited oral presentation  
 American Society for Clinical Oncology, 2014 Best of ASCO Boston Meeting, Boston, MA.

#### **National**

2008 SUCCEED Consultant's Workshop / Presentation of Cases  
 Dava Oncology, Los Angeles, CA

2009 SUCCEED Consultant's Workshop / Workshop Speaker  
 Ariad Pharmaceuticals, Chicago, IL

2017 Managing Metastatic Sarcoma in the Age of Immunologic and Targeted Therapies  
 Cancer Center Grant Rounds, Moffitt Cancer Center, Tampa, FL.

2017 HDAC Inhibition to Advance Treatments for Sarcomas  
Center for Therapy Evaluations Program – Education Session, National Cancer Institute  
Washington DC

## **International**

2009 “Genotyping osteosarcomas”  
International meeting of the Connective Tissue Oncology Society Miami, FL

2010 “Genotyping chordomas”  
International meeting of the Connective Tissue Oncology Society Paris, France

2012 “Timing of surgery around adjuvant treatments”  
Third Sacral Tumor Meeting Rochester, MN

2012 Case Presentation and Discussion of Leiomyosarcoma / Botswana Multidisciplinary  
Tumor Board  
Teleconference between Boston, USA and Gaborone, BY, Botswana-Harvard AIDS  
Institute

2012 Case Presentation and Discussion of GIST / Botswana Multidisciplinary Tumor Board  
Teleconference at Boston, USA, Prague, CZ, and Gaborone, BY, Botswana-Harvard  
AIDS Institute

2012 “Phase I and II studies combining an HDAC inhibitor with Adriamycin for subjects with  
metastatic sarcoma”  
2012 Chawla Rosenfeld international meeting, Sarcoma in Research and Collaboration  
(SARC) Chicago, IL

2013 Using Prosense to Image Residual Tumor Intraoperatively  
Fourth Annual Sacral Tumor Study Group Conference Boston, MA

2013 New Therapeutic Targets for Ewing’s Sarcoma / Session chair: Current Concepts in  
Organ Site Research  
American Association of Cancer Research (AACR) Washington DC

2013 Prioritization of clinical trials / Discussion chair  
Fourth International Chordoma Research Workshop Boston, MA

2014 Pelvic Mucopithelial Carcinoma / Case Presentation  
Teleconference at Boston, USA and Gaborone, BY, Botswana-Harvard AIDS Institute

2014 “Phase 2 Study of Olaparib and Temozolomide in Ewing Sarcoma”  
Connective Tissue Oncology Society, Berlin, Germany

2015 SNU Sarcoma Symposium Update on Sarcoma Research and Clinical Practice / Invited  
Speaker  
Seoul National University Hospital (SNUH) Seoul, South Korea

2018 New Developments in systemic therapy for retroperitoneal sarcomas  
American College of Surgeons Clinical Congress, Boston, MA

## **Report of Clinical Activities and Innovations**

### **Current Licensure and Certification:**

2002 Drug Enforcement Agency  
2002 Controlled Substance Practitioner, MA Division of Food and Drugs  
2003 Massachusetts Board of Registration in Medicine  
2003-2013 Diplomate, American Board of Internal Medicine

2005, renewed Diplomate, Medical Oncology, ABIM  
in 2015

2000-2009 ACLS Certification

2021 Medical License, Rhode Island

2021 Medical License, New Hampshire

2021 Medical License, Maine

### Practice Activities:

2005 - 2011	Infusion Unit	MGH Infusion Unit	Seven sessions per year
2007- present	Outpatient Clinic Sarcoma Clinic	MGH Cancer Center	Two days per week
2007 – 2011	Consult Service	MGH	2-4 weeks per year
2012 – present	Inpatient Oncology Service	MGH	4-5 weeks per year
2016 – present	Inpatient Sarcoma Oncology Consultation Service	MGH	6 months per year
2016 – present	Outpatient Sarcoma Oncology Clinic	Mass General West, Waltham	2 sessions per month

### Clinical Innovations:

Director of Sarcoma Program, MGH	The sarcoma research group has improved clinical care for patients with sarcoma by laboratory, translational, and clinical research that led to new cancer drugs for sarcoma being introduced into standard practice. I led MGH participation in clinical trials that led to FDA approval of several drugs that impact patients with sarcoma or connective tissue tumors, including regorafenib, denosumab, pazopanib, trabectedin, olaratumab, and eribulin. FDA approval of these agents has national and international influence on how sarcoma is managed today.
Sarcoma Multidisciplinary Clinic, MGH	Patients with sarcoma often need up-front multidisciplinary care as the combination of surgery, radiation, and chemotherapy may be needed to cure sarcoma. I led the medical oncology arm in this multidisciplinary clinic, where 2-3 days per week, we see patients as a multidisciplinary group and review cases weekly at a tumor board dedicated to reviewing complicated sarcoma cases. Many of these cases are of patients living outside the regional New England area and sometimes outside the United States. Via this group, we have increased usage of cryoablation, intrahepatic chemoembolization, and radiofrequency ablation as therapeutic techniques in patients with sarcoma.
Cancer Center Committee on Reducing Inpatient	This committee was set up to explore how inpatient care of cancer patients can become more efficient and avoid prolonged hospital stays and unnecessary delays in hospital discharge. Although the intent of this group is to



Admission Days; MGH	operationally improve practice management institutionally, our practice improvements are often copied and practiced at other institutions nationally.
Pilot Program on Providing Patient Housing for multi- day chemotherapy, MGH	In order to avoid unnecessary inpatient hospitalizations for patients who require multi-day chemotherapy administration but might be otherwise hospitalized for logistical reasons, I was the lead MD of a pilot program to provide local housing for these patients so they can receive chemotherapy as an outpatient that is typically given in the inpatient setting. By avoiding unnecessary hospitalizations for these 4-8 patients per month, we have made substantial cost savings for the hospital as well as health benefits for the patients who were not exposed to inpatient health risks.
Cancer Center Committee on Patient Education, MGH	We identified that improving patient education was an important area of need to improve overall patient satisfaction at MGH. I was the lead MD in this multidisciplinary group that performed a variety of focus group meetings to identify critical areas to improve education as part of the overall patient experience at the MGH Cancer Center.
Cancer Center Committee on Substance Use Disorders, MGH	We identified substance use disorders among cancer patients as a significant challenge in optimizing care for a substantial minority of our patients. This committee created a tumor board, where I am the medical oncologist for, where challenging cases are reviewed on a monthly basis to offer management recommendations for clinicians who have a patient exhibiting risk factors for substance abuse.

### **Report of Technological and Other Scientific Innovations**

2015	Publication of Duan et al. "NSC23925, Identification in a High-Throughput Cell-Based Screen, Reverses Multidrug Resistance" (2009) PLOS ONE, has led to application of U.S. patent application Ser. No. 61/205,251, filed Jan. 15, 2009 by Dr. Duan and Dr. Hornicek. See <a href="http://patents.justia.com/patent/20120035126">http://patents.justia.com/patent/20120035126</a>
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### **Report of Education of Patients and Service to the Community**

#### **Activities**

2007- present	Invited Oral Presentation sponsored by the Jennifer Hunter Yates Foundation  "Meet the Experts" annual symposium for sarcoma patients in New England and their families
2008- present	Jennifer Hunter Yates Sarcoma Foundation Annual Walk / Sarcoma Expert  Fundraising effort that annually raises over \$100,000 per year for sarcoma research at MGH.
2008-2010	Community Mentor, Mission Hill Elementary School, Boston, MA Review 6 <sup>th</sup> grade portfolio and oral presentation of end of school projects, one student per year.
2008-2011	MGH Cancer Center/MIT Colleges Against Cancer Shadowing Program

	Mentor of college students exploring a career in medicine, two students per year for one day each.
2008, 2009	Invited expert for a teaching session for MGH infusion nursing staff Topics in Sarcoma Oncology
2009	NECN Broadcast featuring a story about one of my patients and my views on sarcoma treatment. “Student, swimmer wins biggest battle yet.” <a href="http://www.necn.com/Boston/Health/2009/02/12/Student-swimmer-wins-biggest/1234475642.html">http://www.necn.com/Boston/Health/2009/02/12/Student-swimmer-wins-biggest/1234475642.html</a>
2010	Elsevier Global Medical News article including my views on erythropoietin use in oncology. “Groups Update Guidelines on ESAs in Cancer Patients” <a href="http://egmn.idsk.com/stories_us/5_ds_13725772.jsp">http://egmn.idsk.com/stories_us/5_ds_13725772.jsp</a>
2011	Invited expert for a teaching session for MGH nursing oncology course, MGH Nurses Oncology Course Introduction to Sarcoma Oncology
2011	ASCO Post article including my views on strategies used in sarcoma research. “Expert Point of View: Researchers Find Remarkable Heterogeneity in Sarcomas” by Alice Goodman, ASCO Post, Volume 2, Issue 18. <a href="http://www.ascopost.com/issues/december-15-2011/expert-point-of-view-researchers-find-remarkable-heterogeneity-in-sarcomas.aspx">http://www.ascopost.com/issues/december-15-2011/expert-point-of-view-researchers-find-remarkable-heterogeneity-in-sarcomas.aspx</a>
2011	A one hour seminar “Introduction to Sarcoma Oncology” MGH Oncology Nursing Students
2011-2017	Medical Advisory Board, Liddy Shriver Sarcoma Initiative
2012	WGBH interview with Jordan Weinstein of NPR’s Morning Edition about the importance of philanthropy in sarcoma research. “Leading the Fight Against Childhood Cancer” <a href="http://www.wgbh.org/articles/Leading-the-Fight-Against-Childhood-Cancer-6147">http://www.wgbh.org/articles/Leading-the-Fight-Against-Childhood-Cancer-6147</a>
2015-present	Member of the Medical Advisory Board for the National Leiomyosarcoma Foundation
2015-present	Member of the Medical Advisory Board for the Alan B. Slifka Foundation
2015, 2016	Boston Trinity Academy Community participant in the Annual Conference on Diversity
2016	Presented best player of the year awards to Patrice Bergeron, Milan Lucic, and Tuukka Rask on behalf of the MGH Cancer Center “START AWARD” to the Boston Bruins <a href="https://www.nhl.com/video/bruins-season-awards/t-277350912/c-43367403">https://www.nhl.com/video/bruins-season-awards/t-277350912/c-43367403</a>
2017	Public Service Announcement (PSA) highlighting sarcoma care and research at Massachusetts General Hospital WEEI Boston Radio Station 93.7FM Sports Hub

#### Recognition:

2012-2021	“Top Doctors” / Recognition annually by US News and World Report public survey for clinical excellence	Castle Connolly Medical Ltd.
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## **Report of Scholarship**

### **Peer-Reviewed Scholarship in print or other media:**

### **Research Investigations**

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58. Jean-Yves Blay; Sant Chawla; Leanne Seeger; Robert Henshaw; Edwin **Choy**; Robert Grimer; Stefano Ferrari; Peter Reichardt; Piotr Rutkowski; Scott Schuetze; David Thomas; Antonio Lopez Pousa; Yi Qian; Ira Jacobs (2012) “Evaluating Denosumab Treatment for Giant Cell Tumor of Bone With an Independent Imaging Assessment.” Presented at the 12<sup>th</sup> International Conference on Cancer-Induced Bone Disease, Lyon, France.
  59. J. Martin Broto, J. Y. Blay, S. P. Chawla, E. **Choy**, M. Dominkus, J. Engellau, R. Grimer, R. M. Henshaw, Y. Qian, I. A. Jacobs. (2012) “Seguridad y eficacia de denosumab en el tumor de células gigantes de hueso (TCG): análisis interino de un ensayo de fase 2” To be presented at the 2<sup>o</sup> Simposio Nacional de la SEOM, Madrid, Spain.
  60. Jean-Yves Blay; Sant Chawla; Leanne Seeger; Robert Henshaw; Edwin **Choy**; Robert Grimer; Stefano Ferrari; Peter Reichardt; Piotr Rutkowski; Scott Schuetze; David Thomas; Antonio Lopez Pousa; Yi Qian; Ira Jacobs (2012) “Safety and Efficacy of Denosumab Treatment for Giant Cell Tumor of Bone.” Oral presentation at the 12<sup>th</sup> International Conference on Cancer-Induced Bone Disease, Lyon, France.
  61. **Choy**, E., Balasubramanian, S., Butrynski, J., Harmon, D., Morgan, J., George, S., Wagner, A., Rubinstein, Y., Sirisawad, M., Mani, C., Duan, Z., Hornicek, F., and Demetri, G. “Phase I Trial of Abexinostat (PCI-24781) and Doxorubicin in Patients with Metastatic Sarcomas” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.
  62. Antonio Lopez Pousa; **Choy**, Edwin, M.D.; David Thomas; Grimer Robert; Jacobs, Ira; Jean Yves Blay; Leanne Seeger; Martin Blackstein; Peter Reichardt; Piotr Rutkowski; Qian, Yi; Robert Henshaw; Sant Chawla; Scott Schuetze; Stefano Ferrari (2012) “Reporting safety, efficacy, and radiology data from Interim Analysis 3 of the Giant Cell Tumor of Bone 20062004 study.” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.
  63. Jean-Yves Blay; Sant Chawla; Leanne Seeger; Robert Henshaw; Edwin **Choy**; Robert Grimer; Stefano Ferrari; Peter Reichardt; Piotr Rutkowski; Scott Schuetze; David Thomas; Antonio Lopez Pousa; Yi Qian; Ira Jacobs (2012) “Independent Imaging Assessment of Denosumab Treatment for Giant Cell Tumor of Bone.” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.
  64. Mullen, J., Hornicek, F., Deshpande, V., Szymonifka, J., Yeap, B., **Choy**, E., Harmon, D., Yoon, S., Raskin, K., Chen, Y., DeLaney, T., and Nielsen, G. (2012) “Prognostic Value of Treatment-Induced Pathologic Necrosis in High-Grade Extremity and Truncal Soft Tissue Sarcoma Treated with Neoadjuvant Chemoradiotherapy.” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.
  65. Duan, Z., **Choy**, E., Harmon, D., Kobayashi, E., Mankin, H., and Hornicek, F. (2012) “Micro-RNA Expression Profiling Identifies MIR-15B as a Regulator of Multidrug Resistance in Human Osteosarcoma Cell Lines.” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.
  66. Duan, Z., Zhang, J., Ye, S., **Choy**, E., Mankin, H., Gray, N., and Hornicek, F. (2012) “Chemoresistance is Reversed in Multidrug Resistant Osteosarcoma Cell Lines by Combining Kinase Inhibitors with Paclitaxel or Doxorubicin.” Presented at the 2012 Meeting of the Connective Tissue Oncology Society, Prague, Czech Republic.

67. Jean-Yves Blay; Sant Chawla; Edwin **Choy**; Robert Grimer; Stefano Ferrari; Peter Reichardt; Piotr Rutkowski; David Thomas; Yi Qian; and Ira Jacobs. (2012) “Efficacy and Safety of Denosumab in Giant Cell Tumor of Bone: Updated Results from an Interim Analysis of an Ongoing Phase 2 Study” Presented at the 2012 Annual Congress of the European Society for Medical Oncology (ESMO), Vienna, Austria.
68. **Choy**, E., Balasubramanian, S., Butrynski, J., Morgan, J., Sinsawad, M., Mani, C., George, S., Wagner, A., Harmon, D., Rubinstein, Y., Duan, Z., Hornicek, F., and Demetri, G. (2013) “LB-167: Phase I dose escalation study of abexinostat and doxorubicin in patients with metastatic sarcomas.” Presented as a late-breaking poster presentation at the 104<sup>th</sup> Annual meeting of the American Association for Clinical Research (AACR), Washington, D.C. and published in *Cancer Research*: April 15, 2013; Volume 73, Issue 8, Supplement 1.
69. **Choy**, E., Butrynski, J., Harmon, D., Morgan, J., George, S., Wagner, A., D’Adamo, D., Cote, G., Rubinstein, Benes, C., Haber, D., Baselga, J., and Demetri, G. (2013) “LB-174: Translation of preclinical predictive sensitivity of Ewing sarcoma to PARP inhibition: Phase II study of olaparib in adult patients with recurrent/metastatic Ewing sarcoma following failure of prior chemotherapy.” Presented as a late-breaking poster presentation at the 104<sup>th</sup> Annual meeting of the American Association for Clinical Research (AACR), Washington, D.C. and published in *Cancer Research*, April 15, 2013; Volume 73, Issue 8, Supplement 1
70. **Choy**, E., Staddon, A., Alcindor, T., Ferrari, S., Engellau, J., Rutkowski, P., Feng, A., and Jacobs, I. (2013) Denosumab treatment for giant cell tumor metastatic to the lung. Presented at the 2013 International Conference of the American Thoracic Society (ATS), Philadelphia, PA.
71. George, S., Feng, Y., von Mehren, M., **Choy**, E., Corless, C., Hornick, J., Butrynski, J., Wagner, A., Solomon, S., Morgan, J., Heinrich, M., and Demetri, G. (2013) “Prolonged survival and disease control in the academic phase II trial of regorafenib in GIST: Response based on genotype.” Presented at the 48<sup>th</sup> Annual meeting of the American Society for Clinical Oncology (ASCO), Chicago, IL.
72. Thomas, D., Blay, J., Chawla, S., **Choy**, E., Grimer, R., Ferrari, S., Reichardt, P., Rutkowski, P., Qian, Y., and Jacobs, I. “Efficacy and Safety of Denosumab in Giant Cell Tumour of Bone: Updated Results with Independent Radiographic Assessment of Response” Presented at the 2013 Medical Oncology Group of Australia (MOGA) Annual Scientific Meeting, Melbourne, Australia.
73. Grimer, R., Blay, J., Chawla, S., **Choy**, E., Ferrari, S., Reichardt, P., Rutkowski, P., Thomas, D., Qian, Y., and Jacobs, I. “Efficacy and Safety of Denosumab in Giant Cell Tumor of Bone.” Presented to the International Society of Limb Salvage 17<sup>th</sup> General Meeting, Bologna, Italy
74. Ahmad, R., Chen, Y., Hornicek, F., Raskin, K., **Choy**, E., Harmon, D., Cote, G., Nielsen, G., DeLaney, T., and Mullen, J. “Surgical Margin Width and Outcomes in Irradiated Extremity and Truncal Soft Tissue Sarcoma.” Presented at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
75. Cote, G., Shen, J., **Choy**, E., Wagner, A. “Genomic Analysis of over 400 Sarcomas.” Presented as an oral presentation at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
76. Shen, J., Cote, G., **Choy**, E., Yang, P., Harmon, D., Schwab, J., Nielsen, G., Ferrone, S., Wang, X., Wang, Y., Mankin, H., Hornicek, F., and Duan, Z. “PD-L1 Expression in Osteosarcoma.” Presented as a poster at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
77. **Choy**, E., Shen, J., Balasubramanian, S., Butrynski, J., Morgan, J., Sinsawad, M., Mani, C., George, S., Wagner, A., Harmon, D., Rubinstein, Y., Duan, Z., Hornicek, F., and Demetri, G. (2013) “Phase

I dose escalation study of abexinostat and doxorubicin in patients with metastatic sarcomas.”  
Presented at the 2013 Annual MGH Clinical Research Day, Boston, MA.

78. Yang, P., **Choy**, E., Cote, G., Harmon, D., Schwab, J., Nielsen, G., Mankin, H., Hornicek, F., and Duan, Z. “Expression of SOX9 is Crucial in the Growth and Proliferation of Human Chordoma Cells.” Presented as an abstract at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
79. Huang, P., Jacobson, A., Michaelson, J., **Choy**, E., Harmon, D., DeLaney, T., and Chen, Y. “The Role of Radiotherapy in Head and Neck Bone Sarcoma: Analysis Using Population-Based Cancer Registry.” Presented as an abstract at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
80. Huang, P., Jacobson, A., Michaelson, J., **Choy**, E., Harmon, D., DeLaney, T., and Chen, Y. “Prognostic Factors in Head and Neck Soft Tissue Sarcoma: Analysis From Population Based Cancer Registry.” Presented as an abstract at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
81. Duan, Z., Yang, X., **Choy**, E., Cote, G., Harmon, D., Schwab, J., Nielsen, G., Mankin, H., and Hornicek, F. “Exploring the Role of miR-1 (miRNA-1) in Chordoma and its Therapeutic Potentials.” Presented as a poster at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
82. Chen, Y., Calkins, G., Harmon, D., **Choy**, E., Mullen, J., Hornicek, F., Raskin, K., Schwab, J., Nielsen, G., DeLaney, T., and Michaelson, J. “A Binary Biological Model for Predicting Long-term Sarcoma Specific Survival.” Presented as a poster at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
83. Jacobson, A., Huang, P., Michaelson, J., **Choy**, E., Harmon, D., DeLaney, T., and Chen, Y. “Effect of Adjuvant Radiation Therapy on Survival in Head and Neck Osteosarcoma.” Presented as a poster at the 2013 Meeting of the Connective Tissue Oncology Society, New York, NY.
84. Blay, J., Chawla, S., **Choy**, E., Grimer, R., Ferrari, S., Reichardt, P., Rutkowski, P., Thomas, D., Quian, Y., and Jacobs, I. “Efficacy and Safety of Denosumab in Giant Cell Tumor of Bone: Updated Results and Independent Imaging Assessment of Response” Presented to the 2013 Annual Scientific Meeting of the Medical Oncology Group of Australia, Melbourne, Australia.
85. Huang, P., Jacobson, A., Giraud, C., **Choy**, E., Harmon, D., DeLaney, T., and Chen, Y. “Outcomes Of Head And Neck Osteosarcoma: 10-year Experience At A Single Institution.” Presented at the 56<sup>th</sup> Annual Meeting of the American Society for Radiation Oncology (ASTRO), 2014, San Francisco, CA.
86. Pretz, J., Barysaukas, C., Suzanne George<sup>3</sup>; Jason Hornick<sup>5</sup>; Chandrajit Raut, MD<sup>2</sup>; Karen Marcus<sup>1</sup>; Yen-Lin E. Chen, MD<sup>4</sup>; Phillip Devlin<sup>1</sup>; Jeffrey A. Morgan<sup>3</sup>; James Butrynski<sup>3</sup>; Francis J. Hornicek<sup>8</sup>; John Ready<sup>6</sup>; Edwin **Choy**, MD PhD<sup>9</sup>; Thomas F. DeLaney<sup>4</sup>; Elizabeth H. Baldini  
LOCALIZED ADULT EWING SARCOMA (ES): IMPROVED OUTCOMES WITH IFOSFAMIDE AND ETOPOSIDE (IE) ADDED TO CYCLOPHOSPHAMIDE, DOXORUBICIN, AND VINCRISTINE (CAV) CHEMOTHERAPY (CT). Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
87. Jennifer Isler<sup>1</sup>; Edwin **Choy**, MD, PhD<sup>2</sup>; Rashmi Chugh<sup>3</sup>; Lara Davis, MD<sup>4</sup>; Robert G. Maki, MD, PhD<sup>5</sup>; Janice Mehnert<sup>6</sup>; Christian F. Meyer, MD, PhD<sup>7</sup>; Sujana Movva<sup>8</sup>; Vinod Ravi, MD<sup>9</sup>; Kamalesh Sankhala<sup>10</sup>; Arun Singh, MD<sup>11</sup>; Arthur Staddon<sup>12</sup>; Keren Paz<sup>1</sup>; Angela Davies<sup>1</sup>  
A PROSPECTIVE CORRELATIVE TRIAL OF PERSONALIZED PATIENT-DERIVED XENOGRAFT (PDX) MODELING IN PATIENTS WITH METASTATIC OR RECURRENT

- SARCOMA: STUDY DESIGN AND RATIONALE. Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
88. Edwin **Choy**, MD, PhD; Gregory M. Cote, MD PhD; David Harmon; Rebecca S. Heist. CLINICAL ACTIVITY OF CABOZANTINIB IN PATIENTS WITH SARCOMA. Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  89. Edwin **Choy**, MD, PhD1; Suzanne George2; Gregory M. Cote, MD, PhD1; Andrew J. Wagner2; David Harmon1; James Butrynski2; Jeffrey A. Morgan2; George D. Demetri2 PHASE I STUDY OF THE PARP INHIBITOR OLAPARIB, GIVEN WITH TEMOZOLOMIDE, IN PATIENTS (PTS) WITH RECURRENT AND/OR METASTATIC EWING SARCOMA (EWS): AN INTERIM UPDATE. Presented as an oral presentation at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  90. Thomas F. DeLaney1; Aashish D. Bhatt, MD2; Alex Jacobson1; Richard Y. Lee3; Christine Giraud1; Joseph H. Schwab1; Francis J. Hornicek1; Petur G. Nielsen1; Edwin **Choy**, MD, PhD1; David Harmon1; Yen-Lin E. Chen, MD. HIGH DOSE PROTON BEAM BOOSTED RADIATION THERAPY IN THE MANAGEMENT OF NON-SKULL BASE CHONDROSARCOMAS. Presented as an oral presentation at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  91. Gregory M. Cote, MD, PhD1; Yen-Lin E. Chen, MD3; Thomas F. DeLaney3; David Harmon1; Norbert Liebsch3; John T. Mullen4; Alex B. Haynes4; Santiago Lozano-Calderon2; Joseph H. Schwab2; Kevin Raskin2; Francis J. Hornicek2; Edwin **Choy**, MD, PhD1 PHASE I STUDY OF NILOTINIB GIVEN WITH RADIATION FOR PATIENTS WITH HIGH-RISK CHORDOMA. Presented as an oral presentation at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  92. Zhenfeng Duan; Yong Feng; Jianming Zhang; Slim Sassi; Edwin **Choy**, MD PhD; Gregory M. Cote, MD PhD; David Harmon; Henry Mankin; Francis J. Hornicek. DISSECTING THE CDK11 (CYCLIN-DEPENDENT KINASE 11) KINASE PATHWAY IN OSTEOSARCOMA. Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  93. Zhenfeng Duan; Xiaoqian Yang; Yan Gao; Jacson Shen; Yong Feng; Edwin **Choy**, MD, PhD; Gregory M. Cote, MD, PhD; David Harmon; Henry Mankin; Francis J. Hornicek. MIR-15B MODULATES MULTIDRUG RESISTANCE IN HUMAN OSTEOSARCOMA CELLS IN VITRO AND IN VIVO. Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  94. Zhenfeng Duan1; Linlin Zhang1; Arun Iyer2; Xiaoqian Yang1; Edwin **Choy**, MD, PhD1; Gregory M. Cote, MD, PhD1; David Harmon1; Henry Mankin1; Francis J. Hornicek1; Mansoor Amiji2 POLYMERIC NANOPARTICLE-BASED DELIVERY OF MIRNA-199A-3P AND LET-7A INHIBIT PROLIFERATION AND GROWTH OF OSTEOSARCOMA CELLS. Presented as a poster at the 2014 Meeting of the Connective Tissue Oncology Society, New York, NY.
  95. Feng, Y., Shen, J., Gao, Y., Cote, G., **Choy**, E., Mankin, H., Hornicek, F., and Duan, Z. “Programmed Cell Death Ligant 1 Expression in Chordoma” Presented as a poster at the ORS (Orthopaedic Research Society) 2015 Annual Meeting, Las Vegas, NV.
  96. Feng, Y., Gao, Y., Shen, J., Cote, G., **Choy**, E., Mankin, H., Hornicek, F., and Duan, Z. “Expression of PIM1 Kinase in Osteosarcoma and the Clinical Significance” Presented as a poster at the ORS (Orthopaedic Research Society) 2015 Annual Meeting, Las Vegas, NV.
  97. Jung, J., Dickson, M., Schwartz, G., Le Cesne, A., Varga, A., Bahleda, R., Wagner, A., **Choy**, E., de Jonge, M., Light, M., Lee, JS, Mace, S., and Watters, J. “TP53 Mutations Emerge in Circulating



Cell-free DNA Obtained from Patients Undergoing Treatment with the HDM2 Antagonist SAR405838” Presented as a poster at the 2015 Meeting of the American Society of Clinical Oncology, Chicago, IL.

98. Schoffski, P., Maki, RG, Italiano, A., Gelderblom, H., **Choy, E.**, Grignani, G., Camargo, V., Bauer, S., Rha, SY, Chawla, S., Blay, JY, Hohenberger, P., D’Adamo, DR, Chen, R., Chmielowski, B., Le Cesne, A., Demetri, GD., and Patel, S. “Randomized, open-label, multicenter, phase 3 study of eribulin versus dacarbazine in patients (pts) with leiomyosarcoma (LMS) and adipocytic sarcoma (ADI)” Presented as a late breaker oral presentation at the 2015 Meeting of the American Society of Clinical Oncology, Chicago, IL.
99. Molina, G., Hull, M., Chen, Y., DeLaney, TF, Bernstein, K., **Choy, E.**, Cote, G., Harmon, DC, Mullen, JT, and Haynes, AB. “Preoperative radiation therapy combined with radical surgical resection is associated with a lower rate of locoregional recurrence when treating primary retroperitoneal liposarcoma.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
100. Schoffski, P., Maki, RG, Italiano, A., Gelderblom, H., **Choy, E.**, Grignani, G., Camargo, V., Bauer, S., Rha, SY, Chawla, S., Blay, JY, Hohenberger, P., D’Adamo, DR, Chen, R., Chmielowski, B., Le Cesne, A., Demetri, GD., and Patel, S. (2015) “Randomized, open-label, multicenter, phase 3 study of eribulin versus dacarbazine in patients (pts) with leiomyosarcoma (LMS) and adipocytic sarcoma (ADI)” Presented at the 23<sup>rd</sup> Asia Pacific Cancer Conference, Bali, Indonesia.
101. Kabolizadeh, P., Chen, Y., Liebsch, N., Hornicek, F., Schwab, J., **Choy, E.**, Rosenthal, D., and DeLaney, T. “Updated outcome and analysis of tumor response in mobile spine and sacral chordoma treated with definitive high dose photon/proton radiotherapy.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
102. Yoon, C., Lee, H., Tap, W., Hart, C., **Choy, E.**, Kirsch, D., Simon, M., and Yoon, S. “Combining radiation with agents that target VEGF-A and tumor hypoxia prevents sarcoma growth by disrupting tumor vasculature and the hypoxic tumor response.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
103. Bernstein, K., Goldberg, S., Chen, Y., Liebsch, N., DeLaney, T., Ferreira, A., Schwab, J., Hornicek, F., **Choy, E.**, Cote, G., and Harmon, D. “Recurrent Chordomas: Outcomes after salvage treatment.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
104. Lopez, G., Bid, H., Pollock, R., **Choy, E.**, Patel, S., and Lev, D. “Preclinical study: HDAC inhibition combined with gemcitabine for the treatment of leiomyosarcoma.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
105. Duan, Z., Gao, Y., **Choy, E.**, Cote, G., Harmon, D., Mankin, H., Hornicek, F. “CD44 is a direct target of MIR-199A-3P and contributes to aggressive progression in osteosarcoma.” Presented as a poster at the 2015 Meeting of the Connective Tissue Oncology Society, Salt Lake City, UT.
106. Schöffski, P., **Choy, E.**, Le Cesne, A., Camargo, V., Bauer, S., Rha, S., Blay, J., D’Adamo, D., Guo, M., and Maki, R. “Phase (ph) 3 study of eribulin (ERI) or dacarbazine (DTIC) in leiomyosarcoma (LMS) and liposarcoma (LPS) patients (pts)” Presented at the 2016 meeting of the Japanese Society of Medical Oncology, Kobe, Japan.
107. Jones, R., Schöffski, P., Maki, R., Italiano, A., Gelderblom, H., Choy, E., Grignani, G., Camargo, V., Bauer, S., Rha, S., Chawla, S., Blay, J., Hohenberger, P., D’Adamo, D., Wang, B., Chmielowski, B., LeCesne, A., Demetri, G., and Patel, S. “Randomized, open-label, multicenter, phase 3 study of eribulin versus dacarbazine in patients (pts) with leiomyosarcoma (LMS) and

adipocytic sarcoma (ADI)” Presented at the 2016 meeting of the British Sarcoma Group, London, UK.

108. Niu, N., Wang, H., Goldberg, S., Jacobson, A., **Choy, E.**, Cote, G., Harmon, D., Stanton, T., Hornicek, F., DeLaney, T., and Chen, Y. “Secondary leukemia and myelodysplastic syndrome in 375 patients with Ewing sarcoma and osteosarcoma.” To be presented as a poster at the 2016 Meeting of the American Society for Radiation Oncology (ASTRO), Boston, MA.
109. Feng, Y., Liao, Y., Gao, Y., Shen, J., Cote, G., **Choy, E.**, Mankin, H, Hornicek, F., and Duan, Z. “Targeting Cdk11 in Osteosarcoma Cells Using the CRISPR-cas9 System.” Presented at the 2016 Orthopaedic Research Society (ORS), Orlando, FL. Winner of the inaugural Award for Excellence in Basic, Clinical, and Translational Science.
110. Feng, Y., Liao, Y., Gao, Y., Shen, J., Cote, G., **Choy, E.**, Mankin, H, Hornicek, F., and Duan, Z. “Gene Expression Profiling Identifies a Transcriptional Role for CDK11 in the Regulation of CBF $\beta$  Expression in Osteosarcoma” Presented at the 2016 Orthopaedic Research Society (ORS), Orlando, FL.
111. Schöffski, P., Maki, R., Italiano, A., Gelderblom, H., Choy, E., Grignani, G., Camargo, V., Bauer, S., Rha, S., Chawla, S., Blay, J., Hohenberger, P., D’Adamo, D., Wang, B., Chmielowski, B., LeCesne, A., Demetri, G., and Patel, S. “Randomisierte, offene, multizentrische Phase-3-Studie von Eribulin gegenüber Dacarbazin bei Patienten (P) mit Leiomyosarkom (LMS) und adipozytischem Sarkom (ADI).” Presented at the 2016 Annual Meeting of the German Society for Haematology and Medical Oncology (DGHO), Leipzig, Germany.
112. Gentile MS, Jacobson A, Wang H, Goldberg S, **Choy, E.**, Mullen J, Hornicek F, Chen YL and DeLaney TF. “Outcomes in patients with recurrent desmoid tumor managed with surgery alone, combined surgery and radiation therapy or radiation therapy alone.” To be presented as a poster at the 2016 Meeting of the American Society for Radiation Oncology (ASTRO), Boston, MA.
113. Wang, H., Jacobson, A., Goldberg, S., Stanton, T., Harmon, D., Choy, E., Cote, G., Hornicek, F., Raskin, K., Nielson, G., DeLaney, T., and Chen, Y. “Osteosarcoma of the spine and pelvis: 115 patients of a single institution.” To be presented as a poster at the 2016 Meeting of the American Society for Radiation Oncology (ASTRO), Boston, MA.
114. DeLaney, T., Chen, Y., Adams, J., Hickey, S., Wang, D., Baldini, E., Bernstein, K., Yeap, B., Hahn, S., Nielsen, G., **Choy, E.**, Mullen, J., and Yoon, S. “Phase I Trial of Pre-Operative Image-Guided Intensity Modulated Proton Radiation Therapy (IMPT) with Simultaneously Integrated Boost to the High Risk Margin for Retroperitoneal Sarcomas” To be presented in an oral scientific session at the 2016 Meeting of the American Society for Radiation Oncology (ASTRO), Boston, MA.
115. Wang, H., Jacobson, A., Miao, R., Goldberg, S., Harmon, D, **Choy, E.**, Cote, G., Hornicek, F., Raskin, K., Nielsen, G., DeLaney, T., Chen, Y. “Prognostic factors in osteosarcoma: A single institution study.” To be presented at the 2016 Meeting of the American Society for Clinical Oncology (ASCO), Chicago, IL.
116. Farago, A., Heist, R., Azzoli, C., Shaw, A., Yeap, B., and **Choy, E.** “Phase 1/2 study of olaparib and temozolomide in patients with recurrent small cell lung cancer following failure of prior chemotherapy.” To be presented at the 2016 Meeting of the American Society for Clinical Oncology (ASCO), Chicago, IL.
117. H. Wang; R. Miao; A. Jacobson; S. Goldberg; D. Harmon; E. **Choy**; G. Cote; F. Hornicek;

- P. Nielsen; J. Schwab; K. Raskin; T.F. DeLaney; Y.-L. Chen “Extraskkeletal Osteosarcoma: A Retrospective Analysis of 28 Patients Treated at a Single Institution.” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
118. Yunfei Liao; Slim Sassi; Stefan Halvorsen; Yong Feng; Edwin **Choy**; Gregory Cote; Francis Hornicek; Zhenfeng Duan “The Androgen Receptor (AR) is a Potential Novel Prognostic Marker and Oncogenic Target in Osteosarcoma with Dependence on CDK11” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  119. Haotong Wang; Alex Jacobson; Saveli Goldberg; David Harmon; Edwin **Choy**; Gregory M. Cote; Francis Hornicek; Kevin Raskin; Pateur Nielson; Thomas F. DeLaney; Yen-Lin Chen “Osteosarcoma of the Spine and Pelvis: 115 Patients of a Single Institution” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  120. Karen De Amorim Bernstein; Saveli Goldberg; Norbert Liebsch; Joseph Schwab; Francis Hornicek; Gregory M. Cote; Edwin **Choy**; Alex Haynes; John T. Mullen; Yen-Lin Chen; Thomas F. DeLaney “Treatment Outcomes of Patients with Primary Chordomas Treated with Preoperative Radiation (Alone) Followed by Surgery” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  121. Michelle S. Gentile; Alex Jacobson; Haotong Wang; Saveli Goldberg; Edwin **Choy**; John T. Mullen; Kevin Raskin; Nielsen Petur; Francis Hornicek; Thomas F. DeLaney; Yen-Lin Chen “Outcomes in Patients with Recurrent Desmoid Tumor Managed with Surgery Alone, Combined Surgery and Radiation Therapy or Radiation Therapy Alone” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  122. Sherri Z. Millis; Sujana Movva; James Chen; Gregory M. Cote; Edwin **Choy**; Julia Elvin; Alexa Schrock; Jeffrey Ross; Philip Stephens; Vincent Miller; Arun S. Singh; Siraj Ali “Comprehensive Genomic Sequencing of Liposarcoma Patients Identifies a Novel NTRK2 Subgroup.” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  123. Karen De Amorim Bernstein; Saveli Goldberg; Torunn Yock; Yen-Lin Chen; Joseph Schwab; Francis Hornicek; Alex Haynes; John T. Mullen; Gregory M. Cote; Edwin **Choy**; Jennifer Wo; Thomas F. DeLaney “Pregnancy Outcomes After Radiation Therapy” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  124. Gregory M. Cote, MD; Edwin **Choy**; Jeffrey A. Morgan; Priscilla Merriam; Andrew Wagner; Katherine Thornton; GD Demetri; Suzanne George “Phase II Study of PM01183 as a Single Agent or in Combination with Conventional Chemotherapy in Metastatic and/or Unresectable Soft Tissue Sarcomas” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  125. Thomas F. DeLaney; Yen-Lin Chen; Judith Adams; Shea Hickey; Dian Wang; Elizabeth H. Baldini; Karen De Amorim Bernstein; Beow Yeap; Stephen M. Hahn; Petur Nielsen; Edwin **Choy**; John T. Mullen; Sam S. Yoon “Phase I Trial of Pre-Operative Image-Guided Intensity Modulated Proton Radiation Therapy (IMPT) with Simultaneously Integrated Boost to the High Risk Margin for Retroperitoneal Sarcomas” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.
  126. Ann Raldow; Alex Jacobson; Saveli Goldberg; Haotong Wang; Edwin **Choy**; Gregory M. Cote; Francis Hornicek; Thomas F. DeLaney; Yen-Lin Chen “Adult Rhabdomyosarcoma: A Retrospective Analysis of 40 Patients Treated at a Single Institution” Presented at the 2016 Meeting of the Connective Tissue Oncology Society, Lisbon, Portugal.

127. Mirzan, S., Huang, A., Muniappan, A., Keyes, C., **Choy** , E., Uppot, R., and Fintelmann, F. "Thoracic Cryoablation for Palliation of Tumors in Chest Wall and Pleura." Presented at the Society for Interventional Radiology 2017 Scientific Meeting.
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130. Chawla, S., Ganjoo, K., Schuetze, S., Papi, Z., van Tine, B., **Choy** , E., Liebner, D., Agulnik, M., Chawla, S., Wieland, S., Levitt, D. "Phase III study of aldoxorubicin vs investigators' choice as treatment for relapsed/refractory soft tissue sarcomas." Presented at the 2017 Meeting of the American Society for Clinical Oncology. Chicago, IL.
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137. Chen, Y., Miao, R., Goldberg, S., Jacobson, A., Wang, H., Cote, G., **Choy** , E., Hornicek, F., and DeLaney, T. "Significant Risk of Secondary Malignancy in Ewing Sarcoma and Osteosarcoma

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138. Mirzan, S., Huang, A., Muniappan, A., Keyes, C., **Choy**, E., Uppot, R., and Fintelmann, F. “Thoracic Cryoablation for Palliation of Tumors in Chest Wall and Pleura” Presented at the 2018 SIR Annual Scientific Meeting in Los Angeles, CA.
139. Wang, H., Miao, R., Jacobson, A., Boyd, G., Goldberg, S., Mitra, D., Cote, G., **Choy**, E., Hornicek, F., Raskin, K., DeLaney, T., and Chen, Y. “Nodal Involvement and Survival in Synovial, Clear Cell, Angio, Rhabdo, and Epithelioid Sarcoma.” Presented at the 2018 Meeting of the American Society for Clinical Oncology. Chicago, IL.
140. Miao, R., Boyd, G., Dimaria, M., Wang, H., Maquilan, G., Mullen, J., Haynes, A., DeLaney, T., **Choy**, E., Cote, G., and Chen, Y. “Outcomes of intermediate-high grade retroperitoneal sarcomas.” Presented at the 2018 Meeting of the American Society for Clinical Oncology. Chicago, IL.
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144. Raldow, A., Jacobson, A., Niao, R., Goldberg, S., Wang, H., **Choy**, E., Cote, G., Raskin, K., Hornicek, F., DeLaney, T., and Chen, Y. “Worse Survival in Older Adults with Rhabdomyosarcoma: Results of a Large Single Institutional Cohort.” Presented at the 2018 Meeting of the Connective Tissue Oncology Society, Rome, Italy.
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146. Wang, H., Miao, R., Schwab, J., **Choy**, E., Cote, G., Ebb, D., Hornicek, F., DeLaney, T., and Chen, Y. “Definitive High Dose Proton Therapy for Unresected Osteosarcomas of the Spine and Pelvis: A Viable Alternative?” Presented at the 2018 Meeting of the Connective Tissue Oncology Society, Rome, Italy.
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