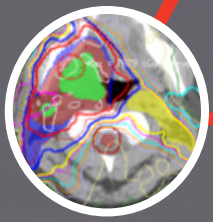


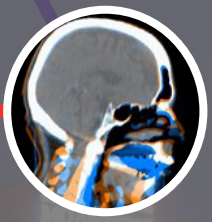
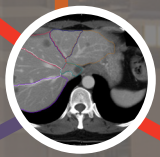
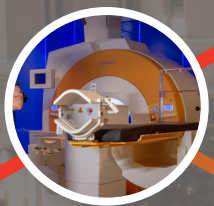


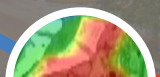
Image-Guided Cancer Therapy Research Program

FY 2022 Program Update



THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center
Making Cancer History®





Many of these photos were taken prior to the COVID-19 pandemic

Table of Contents

A Note from IGCT Director: Dr. Kristy Brock

Hello and Happy New Year! I hope that you ZHUH DEOH WR WDNH VRPH UHÀHFW RQ WKH DPD]LQJ achieved in 2022. As we slowly start to GHFUHDVH RXU ZRUN IURP been great to see many of you "in person" at MD Anderson – and meet some of you for WKH ¿UVW WLPH 7KH QHZ \ WLPH WR UHÀHFW RQ WKH VXFFHVVHV R year to come. This annual report highlights some of the incredible VXFFHVV WKDW RXU ,*&7 IDFXOW\ DQG $ IHZ LWHPV RI QRWH 7KH ,*&7 VWDu L the last few pages of the report for some of the new faces as well as a list of the resources that IGCT can provide. Our IGCT Seminars DQG :RUNVKRSV KDYH FRQWLQXHG WR QRZ RuHU &0(FUHGLW $OO VHPLQDUV RQ GHPDQG DW www.mdanderson.org/IGCT. If you have any VXJJHVWLRQV ± RU ZRXOG OLNH WR SUH One of our biggest accomplishments this year was being awarded DQ 1&, 7 WUDLQLQJ JUDQW 7KLV ZLO GLVFLSOLQDU\ HQYLURQPHQW IXWXUH UDGLDWLRQ RQFRORJ\ LQWHUYHQWLRQ FRUUHODWLYH SDWKRORJ\ LPDJLQJ VFL D KXJH WKDQN \RX WR 'U .DUL %UHZHU WKH ,*&7 ZLWKRXW ZKRP WKLV VXFFHV forward to another exciting year of addressing clinical challenges and translating innovative science to patient care!

Kristy K. Brock

A Note from IGCT Program Director: Kari Brewer Savannah, PhD

+DSS\ 1HZ <HDU $V , ORRN EDFN RQ D SUR
DQG DKHDG WR WKH QHZ \HDU , DP JUD
RI WKH ,*&7 VWDu LQYHVWLJDWRUV DQG
to drive the vision and mission of the IGCT forward.
:H DUH H[FLWHG WR KDYH ZHOFRPHG QLQH
WR WKH ,*&7 LQ)< DQG WR KDYH DFF
¿UVW ,&*7 7 IHOORZ WR RXU QHZ 1&, 7
grant. In line with the addition and expansion of many collaborations
DQG SURMHFWV LQ)< ZH DGGHG WKU
as resources and provide support for IGCT investigators in the areas of computational science and image contouring/annotation. Through the
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KDYH DGGHG D &U\R-DQH 7DSH 7UDQVIHU
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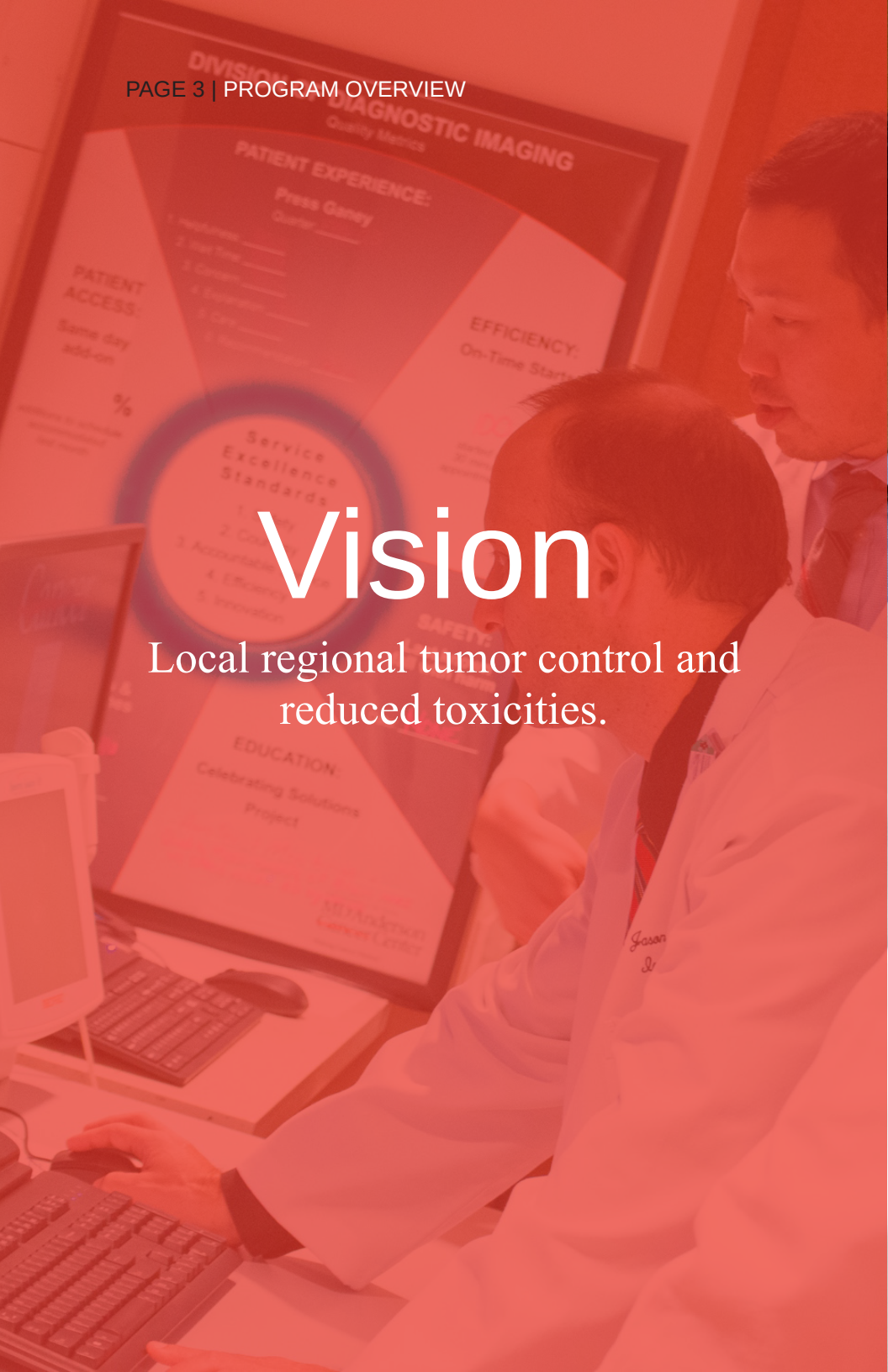
DYDLODEOH IRU RQ GHPDQG SOD\EDFN YLD
year.

5HJDUGV

FY 2022 IGCT Program Highlights:

- ,*&7 VHPLQDUV DQG ZRUNVKRSV DUH QRZ H
  also available to view on demand from the IGCT website.
- The IGCT T32 Training Program was funded by the National Cancer
  ,QVWLWXWH DQG DFFHSWHG LWV ¿UVW WUD
- ,*&7 LQYHVWLJDWRUV ZHUH DZDUGHG !
  multidisciplinary P01 and T32 training grants.
- 7KH ,*&7 KRVWHG VHPLQDUV DQG ZRUN
  DW WKHVH HYHQWV ZLWK UHFRUG DWWHQ
  trainees spanning >40 diverse departments and 13 divisions/operational areas at MD Anderson.
- Nine investigators were welcomed to the IGCT along with several new
  UHVHDUFK VWDu LQ)<



Vision

Local regional tumor control and reduced toxicities.

Mission

(PSRZHU PXOWLGLVFLS
physicians and scientists to address clinicial challenges and technology barriers enabling the translation of innovative science directly to patient care.

Program Overview

Kristy K. Brock, PhD. DABR, FAAPM
Director

Clifton D. Fuller, MD, PhD, DABR
Medical Director, Radiation Oncology Branch

The Image Guided Cancer Therapy Research Program's vision to harness the synergy of multidisciplinary teams has enabled the acceleration of innovation and its translation to the clinical environment. The program relies heavily on the expertise of its PHPEHUV LQWHUYH GLDJQRVWLF UDGLR VFLHQWLVWV PHGL VXUJHRQV UDGLDW SDWKRORJLVWV DQ increased 'clinical problem' focused interactions clinical limitations DUH LGHQWL¿HG VROXWLRQV GHVLJQHG and clinical trials initiated. These LQLWLDWLYHV PDNH VWULGHV WRZDUGV improving patient care.

,Q ZH H[SDQGHG RXU RULJLQDO trio of strategic priorities to add a fourth priority that is focused on mentorship.

Bruno C. Odisio, MD, DABR
Medical Director, Interventional Radiology Branch

.DUL %UHZHU 6DYDQ Q DHK U3HK '6 :HLQEHUJ 0')
Program Director
Medical Director, Surgical Oncology Branch

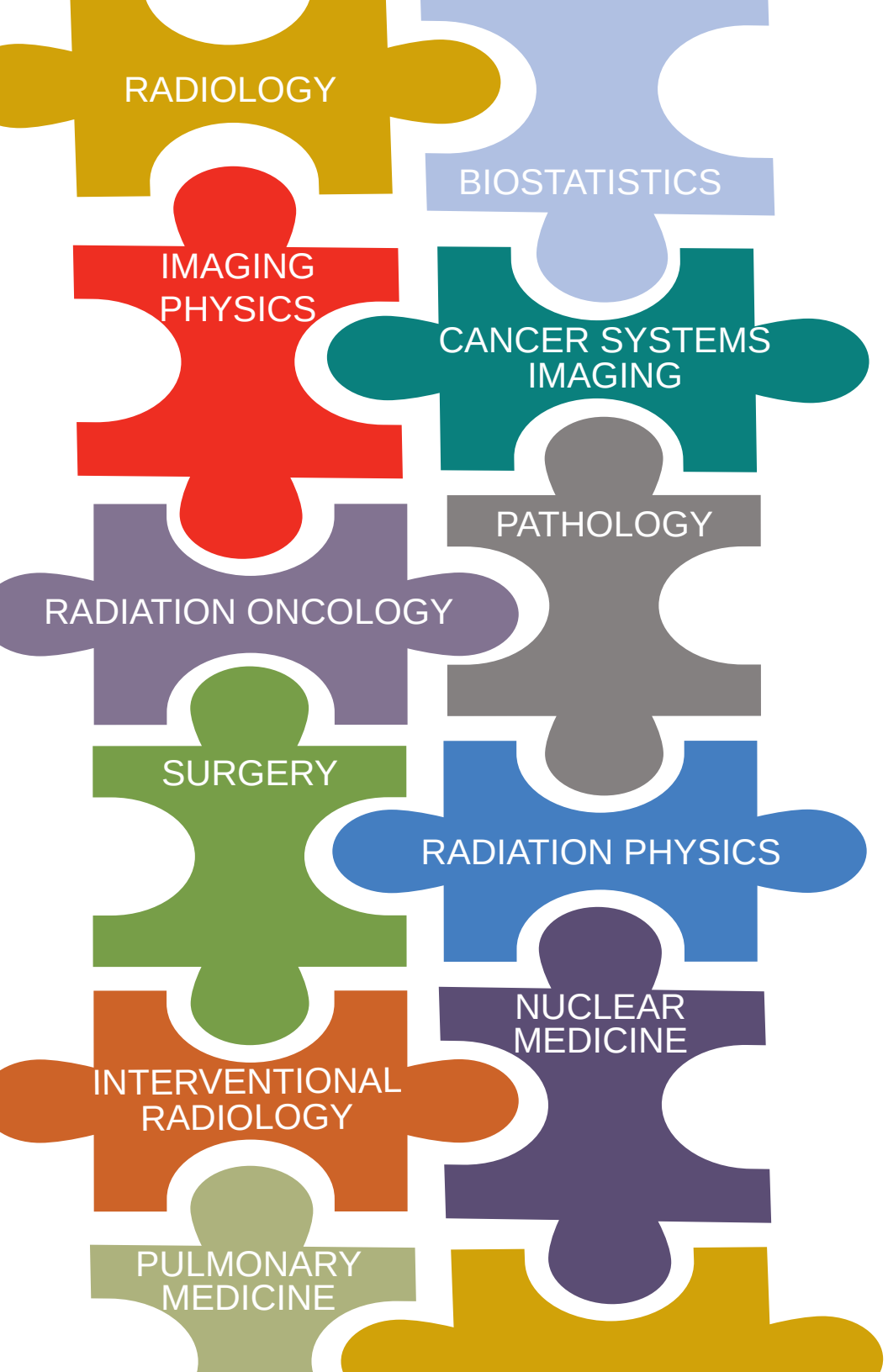
Strategic Goals

1. Develop and validate novel imaging to identify and target the tumor while avoiding normal tissue.

2. Advance in vivo application of imaging to reduce uncertainties in executing the planned intervention.

3. Demonstrate an improvement in the local control and quality of life of cancer patients through image guided cancer therapy.

4. Provide mentorship in developing multidisciplinary research and grant writing.


RADIOLOGY
BIOSTATISTICS
IMAGING PHYSICS
CANCER SYSTEMS IMAGING
PATHOLOGY
RADIATION ONCOLOGY
SURGERY
RADIATION PHYSICS
NUCLEAR MEDICINE
INTERVENTIONAL RADIOLOGY
PULMONARY MEDICINE

Imaging Physics

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Cancer Systems Imaging

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& &KDG 4XDUOHV 3K'

Nuclear Medicine

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Pathology

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Interventional Radiology

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Pulmonary Medicine

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Biostatistics

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Radiation Oncology

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$OEHUW & .R3K J 0'
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6WHYHQ + /1K 0'
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&KDG 7DQJ 0'
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Radiation Physics

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Surgery

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Radiology

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'DZLG 6FKHOOLQJHUKRXW
$UDGKDQD 0 9HQNDWHVDQ

CPRIT & NIH Funding Granted to IGCT Investigators in FY 2022

, * & 7 , Q Y H V W L J D W R U	Department	Grant/Role	Grant Title
C. Chad Quarles, PhD	Cancer Systems Imaging	NCI R01 Multi-PI	Establishing the clinical utility of a consensus DSC-MRI protocol
C. Chad Quarles, PhD	Cancer Systems Imaging	CPRIT	Recruitment of established investigators (RR22038)
Marty D. Pagel, PhD	Cancer Systems Imaging	NCI R43 Multi-PI	Novel multispectral optoacoustic tomography contrast agents for evaluation of early response to radiation therapy
Ann M. Gillenwater, MD	H&N Surgery	NIDCR R01 Multi-PI	Deep learning microscope for slide-free and digital histology
Stephen Y. Lai, MD, PhD Kostia V. Sokolov, PhD	H&N Surgery Imaging Physics	NCI R21 Multi-PI	Radiosensitization of thyroid cancer by cancer cell specific reduction of gold ions
Jeffrey Myers, MD, PhD Andrew Sikora, MD, PhD	H&N Surgery H&N Surgery	NIDCR R01 Multi-PI	Functional roles of GOF TP53 mutations in metastasis and immunosuppression of head and neck cancers
Andrew Sikora, MD, PhD	H&N Surgery	NCI R01 Multi-PI	Targeting head and neck cancer cells and the adverse tumor microenvironment with a novel small-molecule STAT3 inhibitor
Kristy K. Brock, PhD	Imaging Physics	NCI P01 Core Co-Lead	Core 2: Translational biospecimens and imaging biomarkers
Kristy K. Brock, PhD Gregory P. Reece, MD	Imaging Physics Plastic Surgery	NIBIB R01 Multi-PI	Enhanced Biomechanical Modeling of the Breast for Women's Health
Kristy K. Brock, PhD Stephen Y. Lai, MD, PhD C. Dave Fuller, MD, PhD	Imaging Physics H&N Surgery Radiation Oncology	NCI T32 Multi-PI	Image Guided Cancer Therapy T32 Training Program
David T. Fuentes, PhD	Imaging Physics	NCI R21	Characterization of endovascular ablative therapies with computational modeling

, * & 7 , Q Y H V W L Department	Grant/Role	Grant Title
Ho-Ling Anthony Liu, PhD	Imaging Physics	NCI R01 Multi-PI	A comprehensive clinical fMRI software solution to enable mapping of critical functional networks and cerebrovascular reactivity in the brain
Kostia V. Sokolov, PhD	Imaging Physics	NCI T32 renewal Multi-PI	Interdisciplinary Translational Pre/Postdoctoral Program in Cancer Nanotechnology
Kostia V. Sokolov, PhD	Imaging Physics	NCI R01 Multi-PI	In situ cancer cell specific biomineralization to overcome nanoparticle delivery barriers and sensitize pancreatic cancer to radiotherapy
Jia Wu, PhD	Imaging Physics	NCI R01 Multi-PI	Radioimmunogenomic habitat phenotypes to predict efficacy of neoadjuvant immunotherapies on non-small cell lung cancer
Steven J. Frank, MD	Radiation Oncology	NEI R41 & supplemental Funding Multi-PI	Rusalatide acetate (TP508) mitigation of genotoxic radiation damage in human lens epithelial cells Supplemental Funding
Eugene J. Koay, MD, PhD David T. Fuentes, PhD	Radiation Oncology Imaging Physics	NCI R01 renewal Multi-PI	Early detection of hepatocellular carcinoma
Eugene J. Koay, MD, PhD Kristy K. Brock, PhD	Radiation Oncology Imaging Physics	NCI P01 Project Lead Project Co-Lead	Project 1: Understanding normal tissue toxicity to identify patients most likely to benefit from proton therapy
Steven H. Lin, MD, PhD	Radiation Oncology	NCI P01 Project PI	Project 2: Radiation-induced lymphopenia: Understanding predictive modeling and developing photon and proton-based mitigation strategies
Caroline Chung, MD	Radiation Oncology	CPRIT Multi-PI	Imaging-informed, biophysical computational modeling to forecast tumor progression in gliomas
Laurence E. Court, PhD Rick R. Layman, PhD	Radiation Physics Imaging Physics	CPRIT Multi-PI	Automated image quality assessment for AI applications in cancer treatment
Radhe Mohan, PhD	Radiation Physics	NCI P01 Multi PI	Integrating patient-specific clinical and biological factors towards individualizing utilization of proton and photon radiation therapy

Featured IGCT Investigator Grants in FY 2022

James A. Bankson, PhD
Imaging Physics

Stephen Lai, PhD
+HDG DQG 1HFN 6XUJHU\

Vlad C. Sandulache, MD, PhD
%D\ORU &ROOHJH RI 0HGLFLQH

/HYHUDJLQJ +\SHUSRO 05, IRU 3UHFLVLRQ 2Q $SSURDFKHV LQ +HDG Cancer

Following the successful launch of their ¿UVW LQ KXPDQ K\SHUSRO WK\URLG FDQFHU VWXGLH %DQNVRQ /DL DQG 6DQ together once more to submit an NCI R01 that leverages the technology for SUHFLVLRQ RQFRORJ\ LQ FDQFHU 7KH SURMHFW V PHWKRG IRU UHDO WLPH XVLQJ K\SHUSRODUL]HG 05 response to genotoxic stress induced by FLVSODWLQ LQ KHDG DQ FHOO FDUFLQRPD ,Q GR HVWDEOLVK K\SHUSRODUL invasive imaging modality able to predict UHVSRQVH WR WUHDWPHQ QRWHZRUWK\ ¿UVW VWHS oncology approach. Congratulations to the LQYHVWLJDWRUV RQ WKLV and to their funded R01 that is slated to begin in early FY 2023.

Caroline Chung, MD
Data Impact and Governance

David Hormuth, PhD
University of Texas at Austin

,PDJLQJ ,QIRUPHG Biophysical Computational 0RGHOLQJ WR)RUHFD 3URJUHVVLRQ LQ *OL

Dr. Caroline Chung at MDACC partnered with Dr. David Hormuth of UT Austin Oden Institute to submit a CPRIT grant WKDW VHHNV WR GHYHO D PDWKHPDWLFDO PRGH FRPSXWDWLRQDO IUDPHZ DQG VSDWLDOO\ PDS PRU WUHDWPHQW UHVLVWDQW SHUVRQDOL]HG WUHDWP receiving radiation therapy for gliomas. The proposal leveraged preliminary data IURP WKHLU SUHYLRXV ZR FROODERUDWLYH LQLWLD WKH 2GHQ ,QVWLWXWH D Computing Center. Their CPRIT collaboration integrates multiparametric magnetic resonance imaging GDWD ZLWK PHFKDQLVP EDVHG PDWKHPD UHVSRQVH HQDEOLQJ SK\VLFLDQV WR I SUHGLFWLYH DGDSWLYH UDGLRWKHUDS control. Congratulations to Drs. Chung and Hormuth on the CPRIT funding awarded in February 2022.

Featured IGCT Investigator Grants in 2022

Rahul Sheth, MD
Interventional Radiology

$Q ,PDJH *XLGHG Immunotherapy and +\SHUWKHUPLD 'HOLYH WR 2YHUFRPH %DUULH 7XPRU ,PPXQLW\ IRU $ +HSDWRFHOOXODU &DU

*DSV LQ NQRZOHGJH UHJDU delivery of immunotherapies and microenvironment priming lead Dr. Rahul 6KHWK WR SXUVXH UHVHDU PXOWL PRGDOLW\ LPDJH J WR PD[LPL]H WXPRU LPPXQLW\ LQ WKH carcinoma patients. His research will evaluate a novel intratumoral GUXJ GHOLYHU\ V\VWHP ZLWK DQ DGMXV VSHFL¿FDOO\ GHVLJQHG IRU LQWUDWXP (the ImFusion system). The system allows for controlled drug delivery DQG UDGLRIUHTXHQF\ PHGLDWHG LQWUD to prime the tumor microenvironment for immune activation. This ZRUN UHSUHVHQWV D VLJQL¿FDQW H[SD in locoregional therapies to its application as a potential immune SULPHU +DYLQJ VFRUHG IDYRUDEO\ 1, project is anticipated in FY 2023. Congratulations to Dr. Sheth on this outstanding research and anticipated R01 funding.

“I am very much looking forward to continuing collaborations with IGCT in the new year. IGCT’s expertise in pre-, intra-, and post-procedural image guidance is second to none, and there are multiple exciting projects I can’t wait to work on together.”

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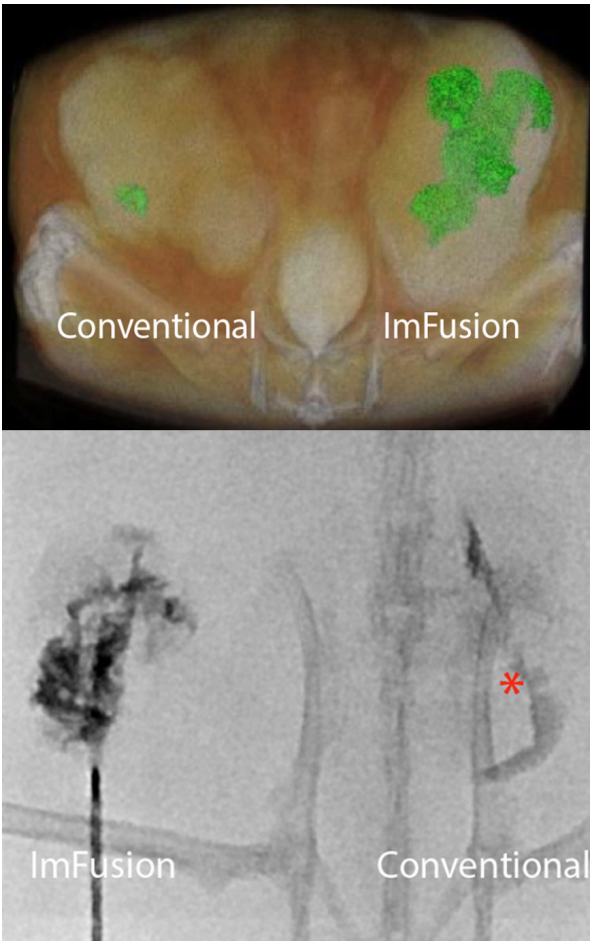

Featured IGCT Research

6XUJLFDO 'DWD 6FLHQF
6XUJLQHHULQJ 3URJUD

Dr. Siewerdsen launched the Surgical Data Science (SDS) Program and Surgineering Lab at UT MD Anderson in July 2022. The SDS Program aims to gain new insights on IDFWRUV DuHFWLQJ YDULDELOLW\ LQ V predictive models based on the capture and curation of conventionally HSKHPHUDO PXOWL PRGDOLW\ GDWD JH also employs systems engineering approaches for Surgical Process 0RGHOLQJ 630 DSSURDFKHV WR JDLQ SURFHGXUDO ZRUNÀRZ DQG LGHQWLI\ DQG RSWLPL]DWLRQ 5HFRJQL]LQJ WKDW surgical systems and data are vital to advancing the quality and value RI VXUJHU\ LQ GHFDGHV DKHDG 'U 6LH Lab to support activities in development and translation at UT MD Anderson. The Surgineering Lab features advanced systems for LPDJH JXLGHG VXUJHU\ LQFOXGLQJ LQ HQGRVFRS\ DQG VXUJLFDO JXLGDQFH D a realistic Operating Room (OR) and will form an important proving ground and home base for translational research. Dr. Siewerdsen and KLV WHDP RI 6XUJLQHHUV EULQJ H[SHU WHFKQRORJ\ LPDJH DQDO\WLFV VXUJL UHJXODWRU\ VFLHQFH WR WDFNOH FKDO LQWHJUDWLRQ DQG VXUJLFDO GDWD VF

“The Surgineering Lab extends the capabilities of the IGCT Program for interdisciplinary collaborations in surgery. Dr. Brock’s leadership of the IGCT Program was the spark that helped to ignite interest in creating such a lab with cutting-edge technologies that mimic a clinical OR co-located among IGCT resources. The 6XUJLQHHULQJ DQG 6XUJLFDO 'DWD naturally with ongoing research in the IGCT, where imaging is recognized as one of the most vital forms of technology and data streams in the operating room.”

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3URIHVVRU 'HSDUWPHQW RI ,PDJLQJ
'LUHFWRU 6XUJLFDO 'DWD 6FLHQFH 3
Science in Oncology

Featured IGCT Research

Gregory P. Reece, MD
3URIHVVRU 3ODVWLF 6XUJHU\

Kristy K. Brock, PhD
3URIHVVRU ,PDJLQJ 3K\VLFV

Enhanced Biomechanical 0RGHOLQJ RI WKH %UH :RPHQV +HDOWK

'UV *UHJ 5HHFH DQG .U DUH SDUWQHULQJ ZLWK 'U %LRPHGLFDO (QJLQHHULQJ DQ 1,%,% 5 IXQGHG PXO research study. The team is leveraging FRPSOH[ELRPHFKDQLFDO P OHDUQLQJ VWUXFWXUDO correlative pathology to create a structurally accurate computer model of the breast that is a faithful reproduction of the anatomy. Their overall vision is to improve the accuracy of the model such that it can be used as a reliable tool in the diagnosis and PDQDJHPHQW RI EUHDVW F HGXFDWLRQ DQG WUDLQLQJ IRU EHWWHU VKDUHG GHFL FORWKLQJ GHVLJQ HVSHFLDOO\ IRU ZRPH period. They aim to improve the model by determining the anatomical and biomechanical characteristics of the fascial support system of the EUHDVW XQGHUVWDQGLQJ WKH VHQVLWL DFURVV WKH SRSXODWLRQ DQG YDOLGD ZLWK WKHLU LQKHUHQW XQFHUWDLQWLH Drs. %URFN DQG 5HHFH KDYH OHYHUDJHG PDQ including extensive use of the Xerra CFT and CryoJane tape transfer system for correlative pathology.

³&ROODERUDWLQJ ZLWK WKH ,*&7 WH made the grant writing process an organized and HvFLHQW H[SHULHQFH EHFDXVH RI WK management skills, professional experience and pleasant personalities. For instance, they introduced us to an alternative grant format that helped us focus our thoughts, which facilitated grant writing in record time. While much of our work together lays ahead of us, I know that their insight, cutting edge imaging technology, and modeling abilities will prove invaluable as we work to complete the grant."

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Featured IGCT Research

Bruno C. Odisio, MD
$VVRFLDWH 3URIHVVRU
Interventional Radiology

6WHUHRWDFWLF /LYHU ZLWK ,QWUD $UWHULDO $UWHULRJUDSK\ DQG $E &RQ¿UPDWLRQ 6RIWZDU $VVHVVPHQW 67(5(2/$%

'U 2GLVLR¶V 67(5(2/$% WUI advances in stereotactic guidance used at MD $QGHUVRQ LQ QHXURVXUJHU\ liver ablation therapy in the interventional UDGLRORJ\ VHWWLQJ 7KH WULDO ZLOO D DUWHULRJUDSK\ DQG DEODWLRQ FRQ¿UPD DVVHVV DEODWLRQ PDUJLQV UHVSHFWLYH the rates of local tumor progression following colorectal liver metastasis DEODWLRQ WKURXJK LWV LQQRYDWLYH SUR VWXG\ UHSUHVHQWV WKH ¿UVW WULDO XVL LQ WKH 8QLWHG 6WDWHV 'U 2GLVLR DQG I 7DWVXL DQG -HuUH\ :HLQEHUJ 1HXURVXUJ .\OH -RQHV ,PDJLQJ 3K\VLFV DQWLFLSDW during the Spring of 2023. Additional information about the trial can be found at clinicaltrials.gov (NCT #05361551).

“Through the IGCT Research Program, I was able connect with colleagues from the Neurosurgery Department to translate the use of stereotactic imaging guidance for the treatment of liver tumors, which we will evaluate soon under a sponsored clinical trial.”

%UXQR & 2GLVLR 0'
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Image Guided Cancer erapy T32 Training Program

MPIs/Program Directors: Kristy K. Brock, PhD (Imaging Physics) Stephen Lai, MD, PhD (Head and Neck Surgery) C. Dave Fuller, MD, PhD (Radiation Oncology)

The **IGCT T32 Training Program** SURYLGHV LQWHJUDWHG research and training needed for tomorrow's pioneering researchers WR DGYDQFH LPDJH JXLGHG FDQFHU WKH GLDJQRVWLF UDGLRORJ\ UDGLDWLRQ RQFR

3URJUDP 2YHUYLHZ

- &URVV GLVFLSOLQDU\ PHQWRULQJ and support from established clinician scientists and investigators
- 3HUVRQDOL]HG DQG DGDSWDEOH WUDLQLQJ SODQ WR ¿W \RXU FDUHHU goals
- ,PPHUVLYH PXOWL GLVFLSOLQDU\ research
- Clinical shadowing with IGCT IDFXOW\ LQ NH\ LPDJH JXLGHG cancer therapy areas
- 6FLHQWL¿F JUDQW ZULWLQJ training with faculty guidance and mentoring to help the trainee achieve independent funding H J 1,+ . DZDUGV
- Professional development and NQRZOHGJH EXLOGLQJ ZULWLQJ development opportunities:
  - ,*&7 FRXUVHV
  - 6HPLQDU VHULHV
  - -RXUQDO FOXE
  - &OLQLFDO WULDOV research training

(OLJLELOLW\

- 3K' RU 0' RU 3K' RU HTXLYDOHQW ZLWKLQ degree or completion of clinical residency program)
- Strong desire and interest to pursue research in image guided cancer therapies
- 86 FLWL]HQ RU SHUPD (NIH requirement)

+RZ WR $SSO\

Interested candidates may submit an application to include the below GRFXPHQWV YLD WKH OL below:

- &9
- Research/Interest statement
- Adversity/Diversity statement
- Contact information for three referees to provide letters of reference

Click here to apply today!

To learn more, visit http://www.mdanderson.org/IGCT-T32 or email us at IGCT-T32@mdanderson.org.

Investigators Joining IGCT in FY 2022

Peiman Habibollahi, MD
Assistant Professor
Department of Interventional Radiology

Katherine A. Hutcheson, PhD
Professor
'HSDUWPHQW RI +HDG 1H

Yon Son (Betty) Kim, MD, PhD
Professor
Department of Neurosurgery

Savitri Krishnamurthy, MD
Professor
Department of Pathology

-HuUH\ + 6LHZHUGVHQ 3K
Professor
Department of Imaging Physics

Laurence D. Rhines, MD
Professor
Department of Neurosurgery

Gregory P. Reece, MD
Professor
Department of Plastic Surgery

Ravi Rajaram, MD
Assistant Professor
'HSDUWPHQW RI 7KRUDFLF
Surgery

C. Chad Quarles, PhD
Professor
Department of Cancer Systems Imaging

IGCT Seminars and Workshops

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UHVHDUFK DQG FOLQLFDO DSSOLFDWLR
DUH DWWHQGHG E\ IDFXOW\ UHVHDUFK
40 diverse departments across 14 divisions/operational areas at
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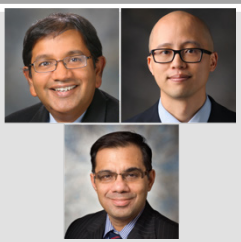
recorded and are available on demand to all MD Anderson employees
YLG OLQN RQ RXU ,*&7 ZHEVLWH ,Q OD
DQG ZRUNVKRSV ZHUH DSSURYHG IRU &
&0(FUHGLWV ZKLFK ZH DUH H[FLWHG

FY 2022 ,*&7 6HPLQDUV		
 September 20, 2021	$QLUEDQ 0DLW\ - Professor, Dept. of Pathology; Scientific Director, Ahmed Center for Pancreatic Cancer Research, MDACC (XJHQH Koay, MD, PhD - Associate Professor, Dept. of GI Radiation Oncology, MDACC Manoop 6 Bhutani MD - Professor, Dept. of Gastroenterology, Hepatology, and Nutrition; Director, Endoscopic Research and Development, MDACC	"Pancreatic Cancer Therapy: Advances & Challenges, Radiomics Prediction in Treatment Response, and Endoscopic Guided Therapies"
 October 4, 2021	Iwan Paolucci , PhD - Postdoctoral Fellow, Dept. of Interventional Radiology, MDACC	"Stereotactic Image-Guided Surgery - An Introduction for Non - Engineers" Part 1 of 2 in a lecture series.
 October 18, 2021	Iwan Paolucci , PhD - Postdoctoral Fellow, Dept. of Interventional Radiology, MDACC	"Stereotactic Image-Guided Ablation of Malignant Liver Tumors - From Bench to Bedside" Part 2 of 2 in a lecture series.

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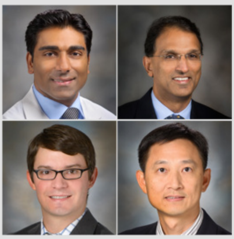
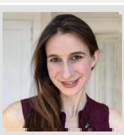
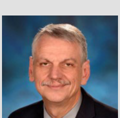
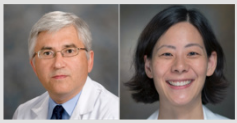
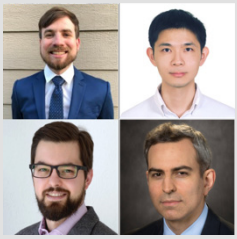
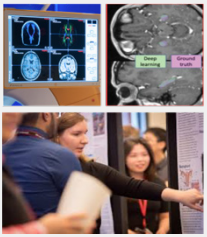
 November 4, 2021	Vinodh A. Kumar, MD - Associate Professor, Dept. of Neuroradiology, MDACC "Introduction to Pre- and Intra-Operative MRI" 6XMLW 6 3U DErofkeXssor0 Dept. of Neurosurgery, MDACC "Intra-Operative Direct Cortical Simulation for Functional Mapping" Kyle R. Knoll, PhD Assistant Professor, Dept. of Neuro-Oncology, MDACC "Assessment of Neurocognitive Function and Outcome" +R/LQJ $QWKRQ\ /LX 3K' Professor, Dept. of Imaging Physics, MDACC "Technical Challenges in Functional MRI"	"Functional Mapping for Brain Tumor Surgery"
 December 6, 2021	6 Cheenu Kappadath , PhD - Associate Professor, Dept. of Imaging Physics, MDACC "Updates on Y90-Radioembolization Dosimetry and Dose-Response" *UHJRU\ & 5DYL-]Associate 0' Professor, Dept. of Nuclear Medicine, MDACC "Current Status of Prostate Theranostics" + &KDUOHV 0DQ-QLQJ 3K' Professor, Dept. of Cancer Systems Imaging, MDACC "Emerging Opportunities in Theranostics Research"	"Theranostics: Current Status and Emerging Opportunities at MD Anderson"
 January 19, 2022	Cynthia Rudin, PhD - Professor, Dept. of Computer Science, Electrical and Computer Engineering, and Statistical Science; Director, Prediction Analysis Lab, Duke University	"Interpretable Neural Networks for Computer Vision: Clinical Decisions that are Computer -Aided, not Automated"
 February 14, 2022	3DOODYL 7LZDUL 3K' Assistant Professor, Dept. of Biomedical Engineering, Case Western Reserve University	"Artificial Intelligence and Computational Imaging: Opportunities for Precision Medicine"
 March 29, 2022	6¡UHQ %HQWPhD - Professor, Dept. of Epidemiology and Public Health; Professor, Dept. of Radiation Oncology; Division Director, Biostatistics and Bioinformatics, University of Maryland School of Medicine	"Seeing is Believing - But Where's the Evidence"

IGCT Seminars and Workshops

FY 2022 ,*&7 6HPLQDUV

 April 11, 2021	,JQDFL:RVW XMD - Professor, Dept. of Translational Molecular Pathology, MDACC "MD Anderson Moon Shot APOLLO Platform" Alda L. Tam, MD - Professor, Dept. of Interventional Radiology, MDACC "Image-Guided Research Biopsies: Best Practices"	"Advances in Image Guided Biopsy"
 May 19, 2021	Toby C. Cornish, MD, PhD Associate Professor, Dept. of Pathology, School of Medicine, University of Colorado - Anschutz Medical Campus	"Quantitative Analysis of Ki67, a Prognostic Biomarker in Gastroentero - pancreatic Neuroendocrine Tumors"
 June 1, 2022	&DOHE 2 &RQQHOO Medical Physics Assistant, Dept. of Imaging Physics, MDACC Yuan 0DR *DU\ /L-Q 0' Postdoctoral Fellow, Dept. of Interventional Radiology, MDACC Iwan Paolucci , PhD - Postdoctoral Fellow, Dept. of Interventional Radiology, MDACC Bruno C. Odisio, MD Associate Professor, Dept. of Interventional Radiology, MDACC	"Anatomical Modeling to Improve the Precision of Image Guided Liver Ablation: A COVER-ALL Clinical Trial Update"
 August 9, 2022	2022 Awardees: %HVW 'HVLJQ *UDSKLFV $ZDUG 5DFKHO ,Y\ (Mentor: Dr. Caroline Chung) %HVW 2YHUDOO 3UHVHQWDWLRQ Zha (Mentor: Dr. Kristy Brock) Best Potential for Clinical Impact – (OOD $OGULGJH (Mentor: Dr. Kate Hutcheson)	"IGCT Summer Undergraduate Student Showcase"

FY 2022 ,*&7 :RUNVKRSV

"Getting Started with AI - Day 1 - AI Resources and Tools" 1RYHPEHU	"An XNAT Overview" &DUROLQH &KXQJ, Vice President and Chief Data Officer, MDACC "Using Docker for AI Research" -RKQ :RRG, Computational Scientist, Dept. of Imaging Physics, MDACC "Enterprise Data Science Environments" -DPHV /RPD[, Data Scientist, MD Anderson "HPC at MD Anderson" Bradley Broom, PhD, Professor, Dept. of Bioinformatics and Computational Biology, MD Anderson "Texas Advanced Computing Center (TACC)" :LOOLDP -RH, Research Associate, Texas Advanced Computing Center, University of Texas at Austin "AI Tools, Tips, and Tricks" Brian M. Anderson, PhD, Medical Physics Resident, University of California-San Diego
"Getting Started with AI - Day 2 - Leveraging Resources and Tools for Research in AI" November 12, 2021	%DVWLHQ 5LJ, Postdoctoral Fellow, Morfeus Lab, Dept. of Imaging Physics, MDACC 5DPL 0XWKXVLY, Postdoctoral Fellow, Fuentes Lab, Dept. of Imaging Physics, MDACC -LD :X, Assistant Professor, Dept. of Imaging Physics, MDACC &DOOLVWXV 1J, Computational Scientist, Court Lab, Dept. of Radiation Physics, MDACC Ankit B. Patel, PhD - Assistant Professor, Dept. of Neuroscience, Baylor College of Medicine; Assistant Professor, Electrical and Computer Engineering, Rice University -RKQ :RRG - Computational Scientist, Dept. of Imaging Physics, MDACC

IGCT Seminars & Workshops

FY 2022 , * & 7 : R U N V K R S V

"Navigating Team Science - Day 1: Building the Right Teams" 0 D U F K	Opening Remarks given by Peter WT Pisters, M.D . - President of MD Anderson "Building Strong Team Foundations" ' D U U H O O 6 L P P R Q Leadership Practitioner, Leadership Institute, MDACC "Building Collaborative Research Teams" Andrew Futreal, PhD Professor and Chair, Dept. of Genomic Medicine; Vice President for Strategic Translational Research Programs, MDACC "Successful Team Science Collaborations: U54 Grants" (X J H Q H Koay, MD, PhD Associate Professor, Dept. of Radiation Oncology, MDACC "Successful Team Science Collaborations: P01 Grants" & ' D Y H) X O O H U Associate Professor, Dept. of Radiation Oncology; Research Director, Radiation Oncology, MDACC "Successful Team Science Collaborations: Multi - Institutional Clinical Trials" Jennifer K. Litton, MD Professor, Dept. of Breast Medical Oncology; Vice President of Clinical Research, MDACC "Successful Team Science Collaborations: SPORE Grants" Juan Fueyo, MD Professor, Dept. of Neuro-Oncology, MDACC

FY 2022 ,*&7 :RUNVKRSV

"Navigating Team Science - Day 2: Resolving Conflict and Working Through Challenging Discussions“ March 2, 2022	"Ideal Team States: What if Reality Isn't Ideal?" Dustin E. Bennett, BA LI Training Specialist, Leadership Institute, MDACC "Conflict Resolution in Team Science" 6 F R W W % & D Q Professor, Dept. of Health Services Research; Ombudsman, MDACC "Challenges in Team Science and Steps to Resolution" $ Q L U E D Q 0 D L W Professor, Dept. of Pathology and Translational Molecular Pathology; Scientific Director, Ahmed Pancreatic Cancer Center; Deputy Division Head for Academic Science, MDACC "Authorship Conflicts" Varsha Gandhi, PhD Professor and Chair Ad Interim, Dept. of Experimental Therapeutics, MDACC 3DQHO 'LVFXVVLRQ 5HVROYLQJ &RQIOLFWV L 7KURXJK &KDOOHQJLQJ 'LVFXVVLRQV MD Anderson Panelists: Dustin E. Bennett, BA - LI Training Specialist, Leadership Institute 6 F R W W % & D Q Professor of Health Services Research & Ombudsman $ Q L U E D Q 0 D L W - Professor, Dept. of Pathology & Translational Molecular Pathology; Scientific Director, Ahmed Pancreatic Cancer Center; Deputy Division Head for Academic Science Varsha Gandhi, PhD - Professor and Chair Ad Interim of Experimental Therapeutics Robert C. Bast, Jr., MD - Vice President for Translational Research 6 W H S K H Q < / D L - Professor of Head & Neck Surgery & D U R O L Q H & K X Q - Vice President and Chief Data Officer James A. Bankson , PhD - Professor of Imaging Physics 5 H H F F D 0 + R Z - Professor of Radiation Physics $ Q Q + . O R S S 0 - Professor of Gynecologic Oncology

IGCT Seminars & Workshops

FY 2022 , * & 7 : R U N V K R S V	
“Deformable Image Registration Workshop - Day 1: Fundamentals of Deformable Image Registration” 0 D \	“Fundamentals of DIR and Similarity Metrics” : L O O L D P 6 D Q G \ – Professor, Dept. of Radiology, Brigham and Women’s Hospital and Harvard University “Demons Algorithms” * U H J R U \ & 6 K D – Associate Professor and Medical Physicist, Dept. of Radiation Oncology, Massachusetts General Hospital “Free -Form Deformable Algorithms” Jamie McClelland, PhD – Associate Professor, Dept. of Medical Physics and Bioengineering, University College London “Fluid -Flow and Elastic Algorithms” Gary E. Christensen, PhD - Professor, Depts. of Electrical and Computational Engineering and Radiation Oncology, University of Iowa “Deep Learning -Based Algorithms” Jayashree Kalpathy Cramer, PhD – Associate Professor, Dept. of Radiology, Massachusetts General Hospital and Harvard University “Biomechanical Model -Based Algorithms” Kristy K. Brock, PhD - Professor, Dept. of Imaging Physics, MDACC

FY 2022 ,*&7 :RUNVKRSV

“Deformable Image Registration Workshop - Day 2: Successes and Future Work in Deformable Image Registration” 0D\	“Physician’s Perspectives” Cynthia Menard, MD – Head – Radiation Oncology Service, CHUM; Professor, Universite de Montreal “Brain” 0LFKDHO 0L - Professor, Depts. of Biomedical Engineering and Radiology, Vanderbilt University “Spine” -HIIUH\ + 6LHZHU - Professor, Dept. of Biomedical Engineering, Johns Hopkins University “Head and Neck” Jan Jakob 5RQ, PhD - Professor, Dept. of Radiation Oncology, Netherlands Cancer Institute “Lung” *HRII +XJR - Professor, Dept. of Radiation Oncology, Washington University School of Medicine in St. Louis “Liver” -RQ 6 +HLVHO - Postdoctoral Research Scholar, Memorial Sloan Kettering Cancer Center “Pelvis” Bastien Rigaud, PhD – Research Scientist, University of Rennes

Our IGCT Sta and Resources are Growing

$XVWLQ &DVWHOR %6 joined the IGCT in Spring 2022 as an Associate Systems Analyst. Austin is a graduate from the University RI &DOLIRUQLD 6DQWD %HDUQHG D %6 LQ)LQDQFLDO 6WDWLVWLFV $XVWLQ EULQJV FRPSXWDWLRQDO VFLHQWLILF FRPSXWHU YLVLRQ LPDJH GHYHORSPHQW DQG VWDWLVWLFV ,*&7 to include AI model development for segmentation of the liver for the &29(5$// WULDO GHIRUPDEOH LPDJH UHJLVWUDWLRQ DQG VWUHDPOLQLQJ GDWD for a P01.

Mais Al Taie, MD, PhD joined IGCT as a Research Investigator in the Spring of 2022. Dr. Al Taie received her PhD LQ 5DGLRORJ\ DQG 2QFRORJ\ from the Medical and Dental University and her MD from the University of Mustansiryah in Iraq. Dr. Al Taie's projects include manual and AI DOJRULWKP EDVHG FRQWRXULQJ DQG DV developing robust AI segmentation algorithms and vessel annotation detection on CT and ultrasound images toward the development of a GHHS OHDUQLQJ PRGHO IRU YHVVHO LGH

1LKLO 3DWHO

joined the IGCT as a Research Assistant II in October 2022. Nihil LV D JUDGXDWH IURP WKH 8 where he earned an MS in Computer Science. 3ULRU WR MRLQLQJ WKH ,*& UHVHDUFK LQWHUQ DW %D\C and at Gottingen University. Nihil's primary project is to retrain the Morfeus Lab's deep learning CT segmentation algorithms on newer data with the eventual goal of evaluating their SHUIRUPDQFH RQ 05 LPDJHV YLD WUDQVI VFULSWLQJ $, DOJRULWKP GHYHORSPH VNLOOV WR KLV ZRUN LQ WKH ,*&7 3URJU

.DUL %UHZHU 6DYDQQ

joined the IGCT in Fall 2020 and serves as the 3URJUDP 'LUHFWRU 'U 6DY Chemistry from Hillsdale College and a PhD LQ %LRFKHPLVWU\ DQG %L IURP WKH 0' $QGHUVRQ 87 She previously served as Assistant Professor DW WKH 8QLYHUVLW\ RI 7H[+RXVWRQ %DSWLVW 8QLYHUVLW\ 'U 6D LQ WKH GHVLJQ PDQDJHPHQW DQG DV SURJUDPV HGXFDWLRQDO SURJUDPPLQ GLYHUVLW\ HTXLW\ DQG LQFOXVLRQ I 67(0 ¿HOGV 'U 6DYDQQDK EULQJV D VW DGPLQLVWUDWLRQ VFLHQWL¿F SURMH PDQDJHPHQW WR KHU UROH LQ WKH ,*& PXOWLGLVFLSOLQDU\ VFLHQWL¿F SURMH SUHSDUDWLRQ DQG PDQDJHPHQW DQG F

&DOHE 2¶&RQQRU 06 joined the IGCT as a Physics Assistant in Summer 2021. Caleb HDUQHG KLV %6 DQG 06 LQ University of Louisiana at Lafayette. In his UROH LQ WKH ,*&7 &DOHE automation of existing algorithms for clinical UHVHDUFK DQG GHSOR\PHQ LPDJH DQDO\VLV DQG UHJL additional computational areas.

(PPD 0F&ROOXP %6 joined the IGCT as a Research Assistant I in June of (PPD LV D JUDGXDWH I 8QLYHUVLW\ LQ 6W /RXLV D %6 LQ %LRPHGLFDO (QJL projects include assessing accumulated dose delivery of intensity modulated photon therapy in prostatic adenocarcinoma patients DQG RQJRLQJ FROODERUDWLRQV ZLWK Innovation Program at MD Anderson. Prior to joining the IGCT full WLPH (PPD VSHQW VXPPHUV LQ DQ researcher with IGCT.

$QGUHQLNL 0LWURX joined the IGCT as a Physics Assistant in Fall 2021 after completing her MS in Medical Physics at the University of Massachusetts Lowell. Her projects include dose accumulation using deformable image registration in head DQG QHFN FDQFHU SDWLH pathology. She has expertise in image DQDO\VLV DQG UHJLVWUDWLRQ DQDWR and many other computational areas.

How Can the IGCT Help You as an IGCT Investigator?

Have a small project or piece of a grant that requires a computa
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Please contact the IGCT Program (IGCTR@mdanderson.org) or reach out to IGCT Director Dr. Kristy Brock to learn more about IGCT-based resources or discuss options and resource availability.

- Medical image annotation and contouring
- Image analysis
- Image registration
- $QDWRPLFDO PRGHOLQJ
-)LQLWH HOHPHQW PRGHOLQJ anlysis
- Coding and scripting
- AI algorithm development
- Scaling code/building pipelines
- $SSOLFDWLRQ FRQW development
- &RPSXWDWLRQDO V

To learn more about the Image Guided Cancer Therapy Program at
0' $QGHUVRQ &DQFHU &HQWHU SOHD
www.mdanderson.org/IGCT or email us at igctr@mdanderson.org.

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