

Please erase boards when you are finished. Whiteboards are erased every Friday. Thank you!





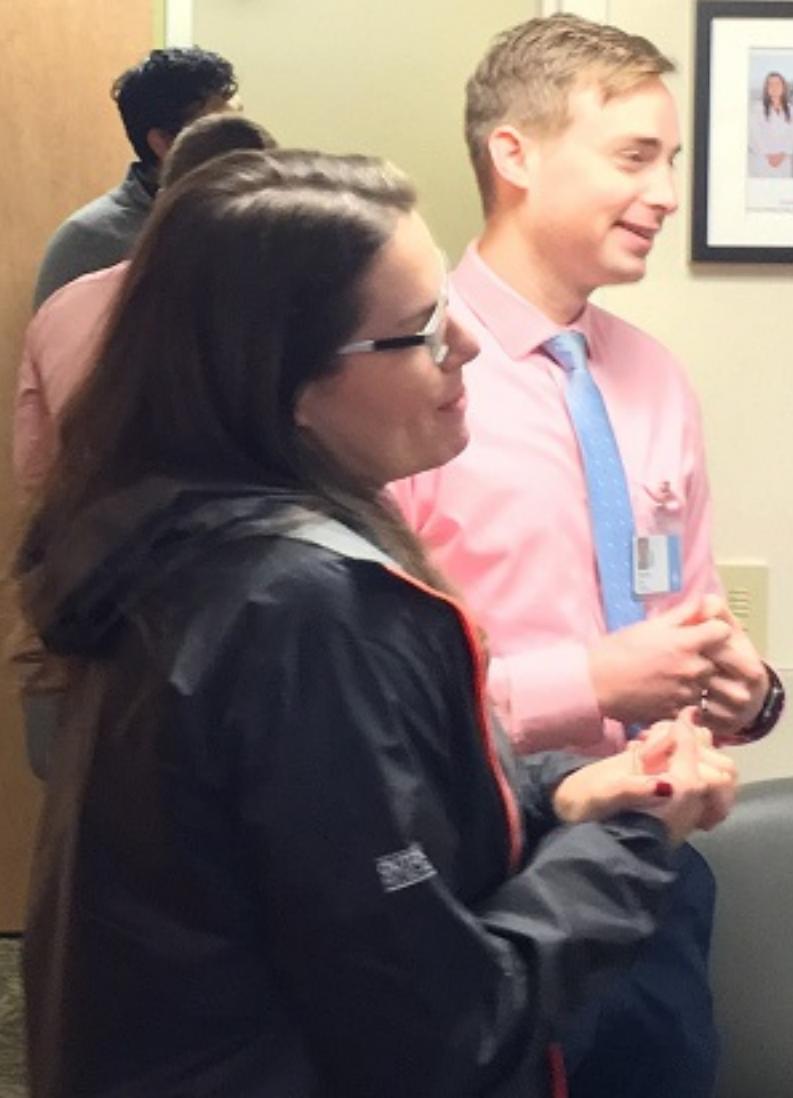






Thermo

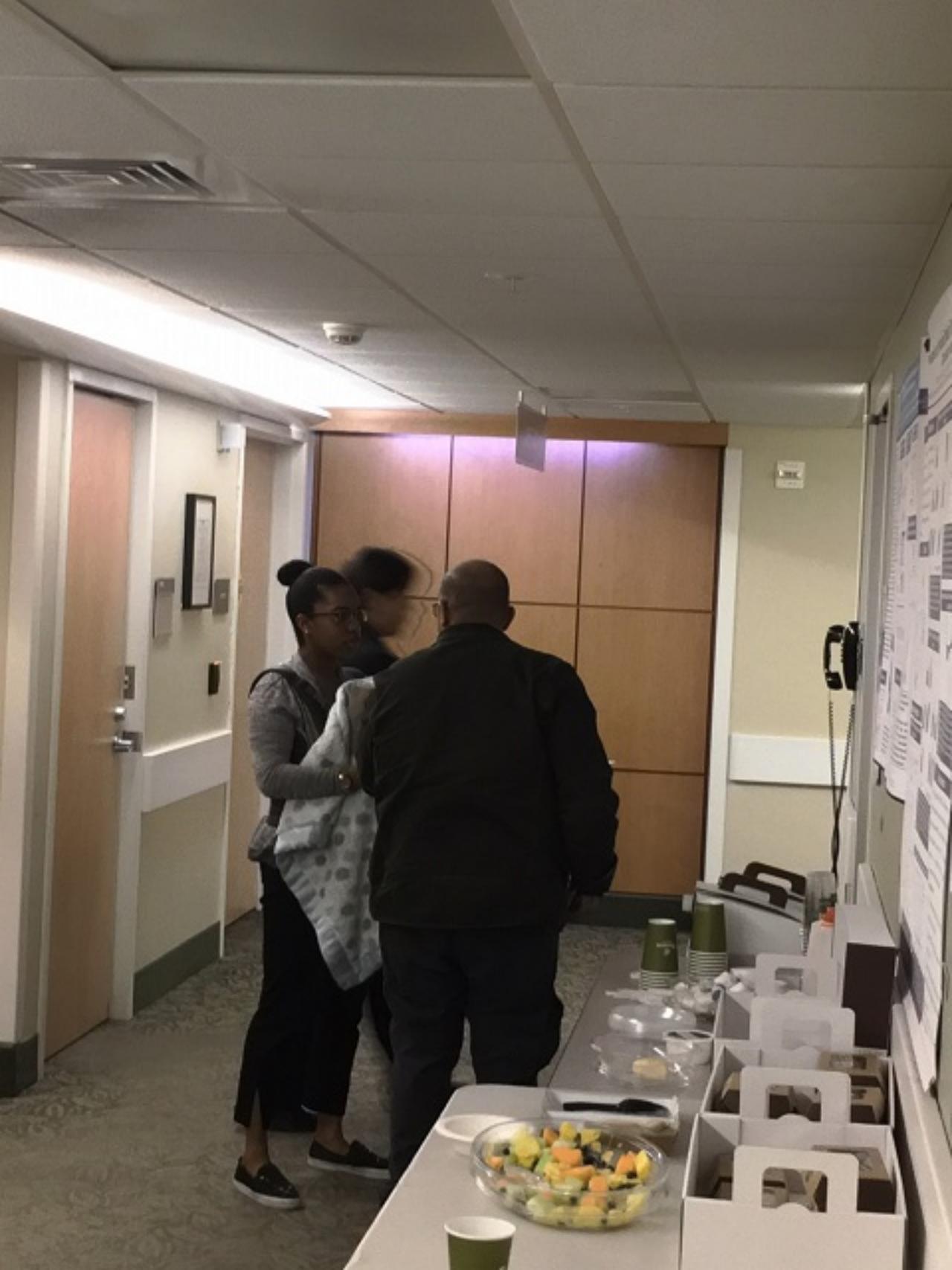




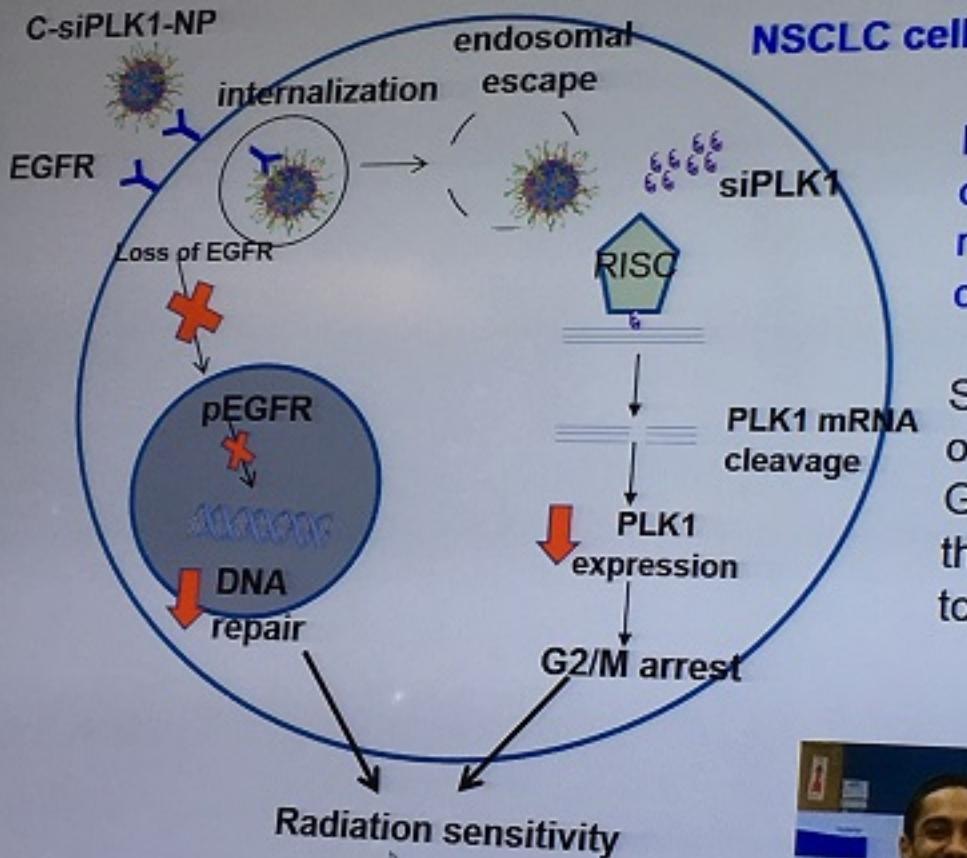






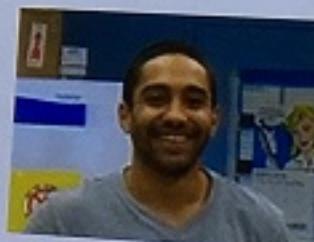


New radiation sensitizer by targeting EGFR and PLK1



Inhibit EGFR with cetuximab on our nanoparticles → reduced the DNA repair capability after the radiation

Silencing PLK1 with siRNA on our nanoparticles → G2/M cell arrest, the stage that cells are most sensitive to radiation



Moataz Reda

Demographic and Clinical Characteristics of 42 Hospice Patients with bone metastases

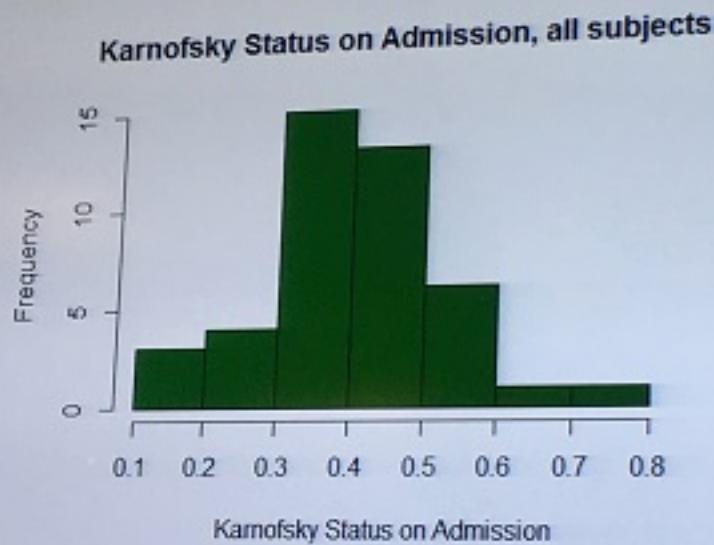
Age (mean (sd))		72.02 (11.94)
Gender (%)	Female	21 (50.0)
	Male	21 (50.0)
History of RT receipt (%)	Yes	16 (38.1)
	No	26 (61.9)
RT within 1 month of admission (%)	Yes	7 (16.7)
	No	35 (83.3)
Karnofsky Performance Status (mean (sd))		44 (12)
Cancer histology (%)	Lung	26 (61.9)
	Breast	6 (14.3)
	Prostate	7 (16.7)
	Thyroid	1 (2.4)
	Kidney	2 (4.8)
Morphine Equivalent on admission (mg/d) (mean (sd))		368.93 (189.08)
Morphine Equivalent at death (mg/d) (mean (sd))		528.45 (297.08)
Change in Morphine Equivalent (mg/d) (mean (sd))		159.52 (269.44)
Percent change in Morphine Equivalent (%)	Less than 50% increase	26 (61.9)
	50% increase or greater	16 (38.1)
Hospice length of stay (mean (sd))		37.64 (62.00)

Mitin et al., *Unpublished data*

Length of Stay on Hospice

- Length of stay on hospice increases with:
 - Increased age ($p=0.002$)
 - Higher KPS ($p=0.029$)
 - Female gender ($p=0.0465$)
- Length of stay on hospice is not associated with:
 - Opioid use on admission, at death, change in use
 - Cancer histology
 - Receipt of RT within 1 month of enrollment

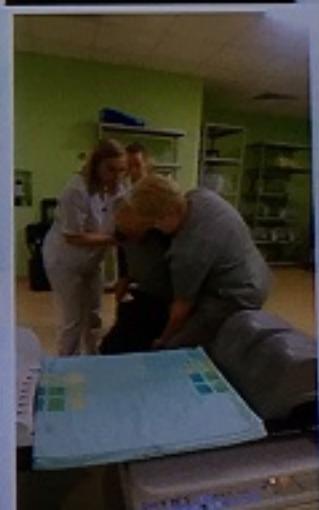
Performance Status on Admission



- Opioid use on admission is significantly associated with lower KPS ($p=0.023$)

Timeline:

- 1:45 p.m.: arrival to clinic, registration
 - 1:50 p.m.: consultation with MD, clinical exam
 - 2:10 p.m.: CT simulation
 - 2:35 p.m.: contours completed
 - 3:05 p.m.: plan ready for review
 - 3:30 p.m.: QA
 - 3:40 p.m.: delivery of single fraction palliative RT
 - 4:00 p.m.: patient leaves clinic



Future Directions

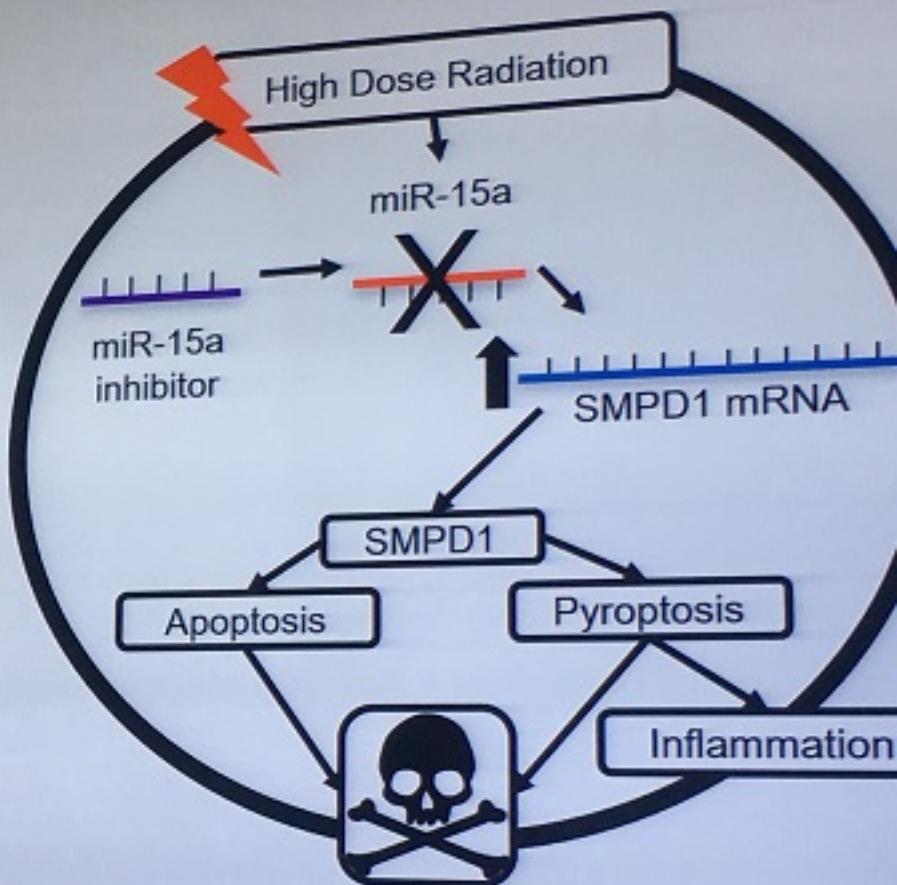
- How does genotoxic stress miR-15a production?
- What is the phenotypic contribution of SMPD1 in miR-15a inhibition-induced endothelial cell death?
- Inflammasome gain and loss of function
- What are the immune infiltrate components and how do they function?

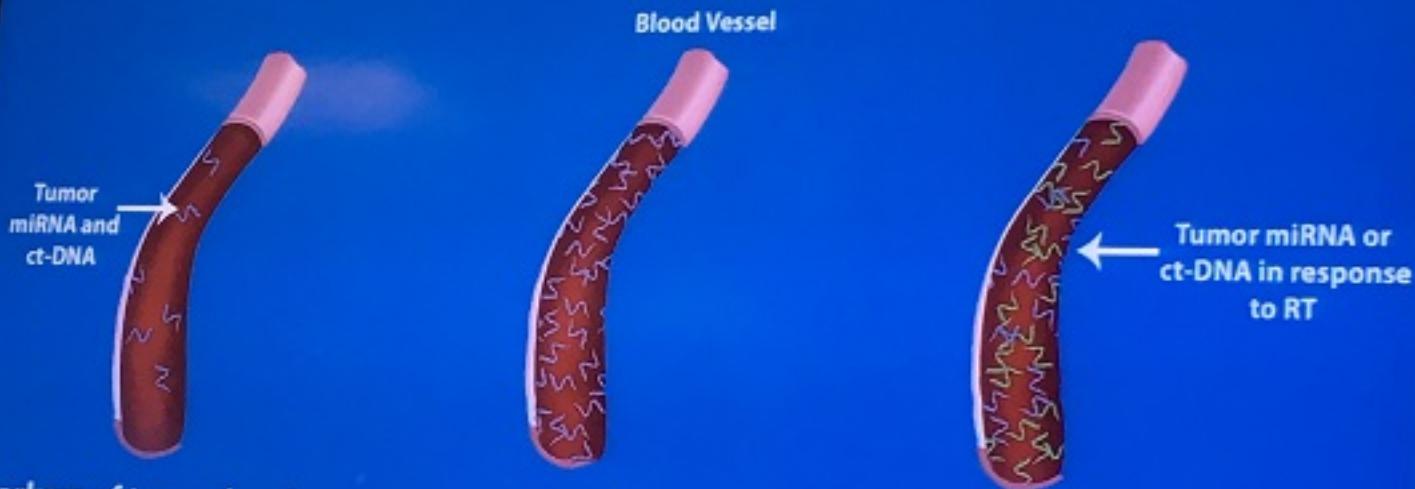
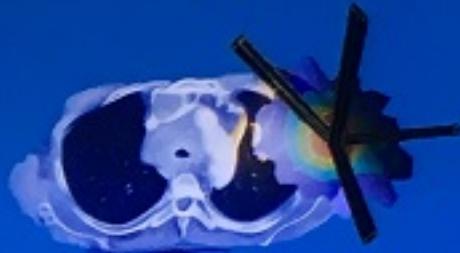
Long term goals

targetable/actionable nodes that mimic the effects of high dose radiation in miR pathways

NA delivery vehicles

NA biomarker platforms





Markers of tumor burden, aggressiveness, histology, and overall survival

Elevation in biomarker levels as tumor volume increases

Secretion of biomarkers following RT reflect radiosensitivity of tumor, allowing real-time RT plan modification

Outline

- i. Background
- ii. Boston Lung Cancer Survival Cohort (BLCS)
 - Histology Models
 - Image pre-processing
 - Deep feature extraction
 - Machine learning classifiers
 - Results
 - Survival Models
 - Deep neural network
 - Results
 - NSCLC prognostication with ANN
 - Stratifying patient outcomes
- iii. TRACERx collaboration
- iv. Conclusions /current work

YALE SCHOOL OF MEDICINE

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If you have questions, Please contact
Doug Ellis - room 4023 (471)341
Thank you!



Binary classification of NSCLC histology

- Successful binary classification of tumor histology (adenocarcinoma vs. squamous cell carcinoma):

	Accuracy	AUC
K-Nearest Neighbors (k=5)	68%	0.69
LASSO (alpha = 0.1)	74%	0.71
Random Forrest Classifier	68%	0.53
Support Vector Machine	73%	0.64
Fully Connected CNN	72%	0.75

- Dimension reduction of feature space to 46-D from 512-D feature vector

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Thank you!



Establishing Clinical Feasibility of MR-assisted CT-based Cervical Brachytherapy Using Deformable Image Registration

DIR#	Algorithm	Controlling ROI	Other parameters
DIR1	ANACONDA	None	With image information
DIR2	ANACONDA	Cervix and uterus	With image information
DIR3	ANACONDA	Cervix	Discard image information
DIR4	ANACONDA	Cervix and uterus	Discard image information
DIR5	MORFEUS	Cervix	Fixed boundary
DIR6	MORFEUS	Cervix and uterus	Fixed boundary
DIR7	MORFEUS	Cervix, uterus, bladder, and rectum	Fixed boundary

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Establishing Clinical Feasibility of MR-assisted CT Brachytherapy Using Deformable Image Re

Day	Algorithm	Controlling Dose
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
Day 8		

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Other parameters

With image information

With image information

Discard image information

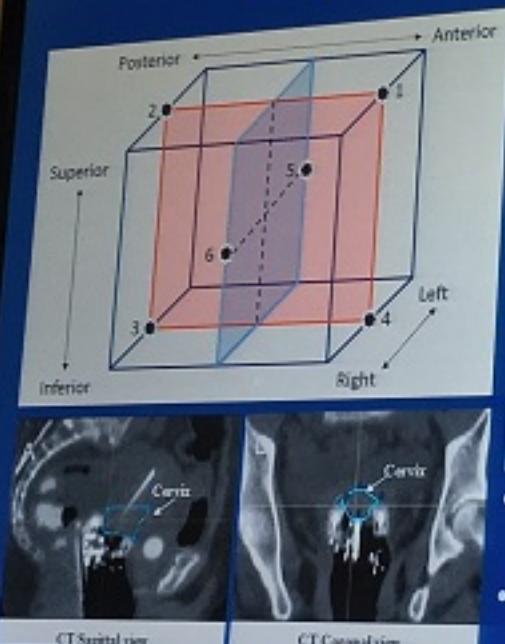
Discard image information

Fixed boundary

Fixed boundary

Fixed boundary

Establishing Clinical Feasibility of MR-assisted CT-based Cervical Brachytherapy Using Deformable Image Registration



Patient #	Cervix landmark displacement		Cervix Dice	Mean Cervix DTA (cm)	Days between MRI and CT
	Mean (cm)	SD (cm)			
1	0.41	0.20	0.87	0.10	4
2	0.27	0.25	0.92	0.07	12
3	0.28	0.22	0.97	0.02	6
4	0.45	0.26	0.89	0.08	6
5	0.24	0.19	0.92	0.07	2
6	0.33	0.22	0.95	0.07	1
7	0.20	0.11	0.97	0.03	2
8	0.31	0.34	0.97	0.02	8
9	0.66	0.54	0.76	0.31	1

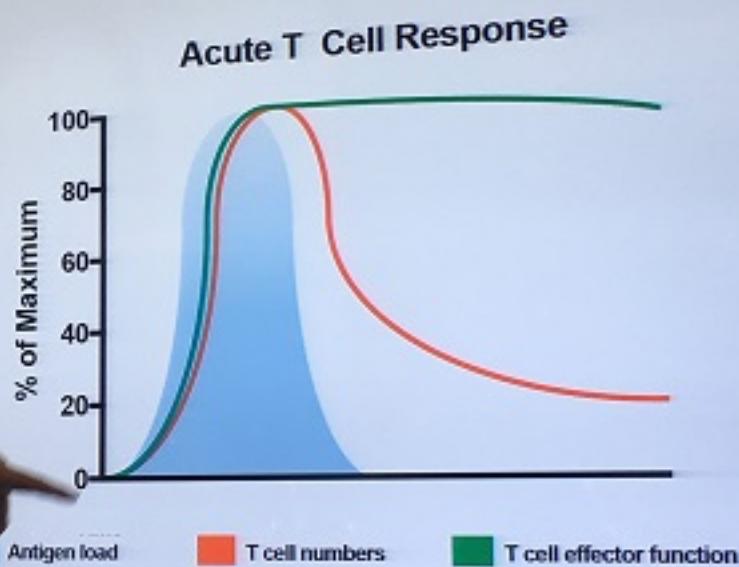
- Results suggest that the deformation process is geometrically and spatially precise
- Differences provided by HR-CTV' occur in the “grey zone” and should be taken into consideration when deformation is used prospectively to assist target delineation



Why do anergy/exhaustion matter?



Acute Viral Infection



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Why do anergy/exhaustion



Acute Viral
Infection

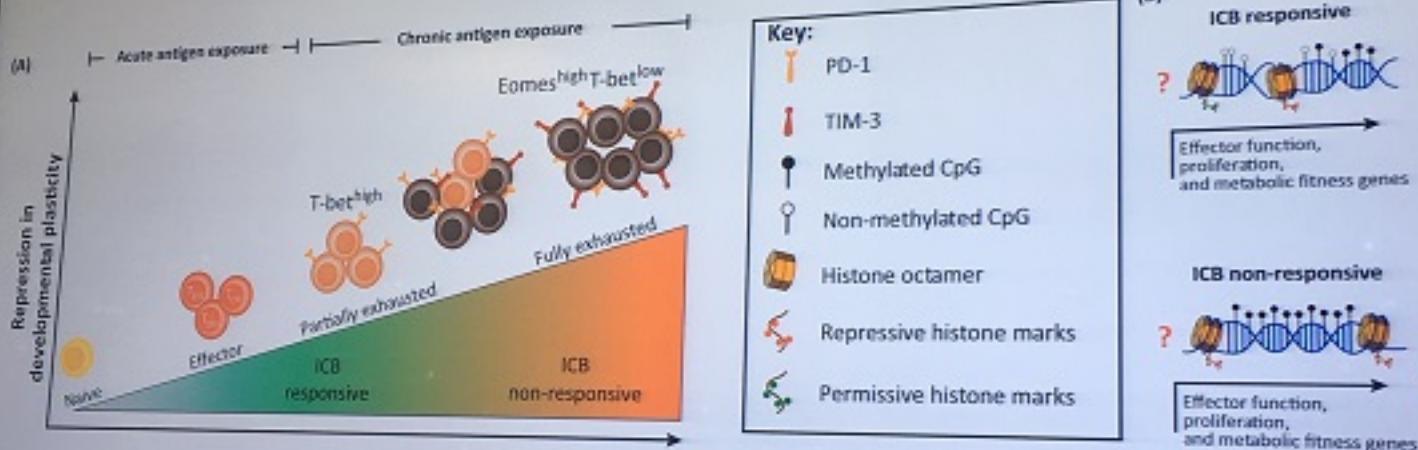
% of Maximum

An

Please Dr
or son
Radi

If you ha
Dose

Exhaustion is linked to epigenetic modification of CD8 T cells



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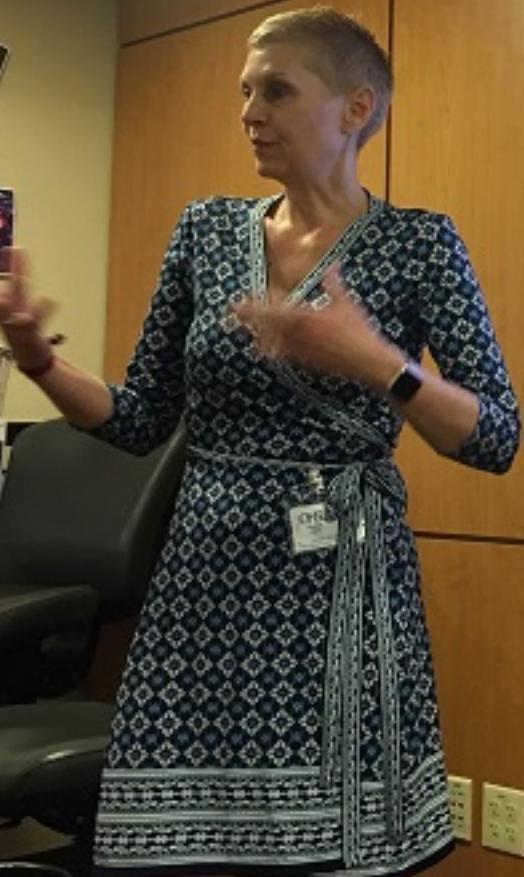
Beyond Ordinary

Empowering
Educating

The Value Proposition of Patient Advocates in Cancer Care

Tambre Leighn
MA, PCC, CPDS, ELI-MP
Scientific Research Advisor, Knight Cancer Institute

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If you have questions, Please Contact Doug Ellis - Room 4013 (K1SM)
Thank you!



The slide features the 'Live Beyond Ordinary' logo at the top left. To the right, the words 'Educating' and 'Empowering' are displayed in pink. Below the title, there is a collage of four smaller images: a large audience in a theater, a woman in a pink jacket, a man in a suit, and a medical or laboratory setting. The overall background of the slide is light orange.

**The Value
Proposition of
Patient Advocates in
Cancer Care**

Tambre Leighn
MA, PCC, CPDS, ELI-MP
Scientific Research Advisor, Knight Cancer Institute

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Geng Li - ext: 8229 (407)384
Thank you!

Obstacle



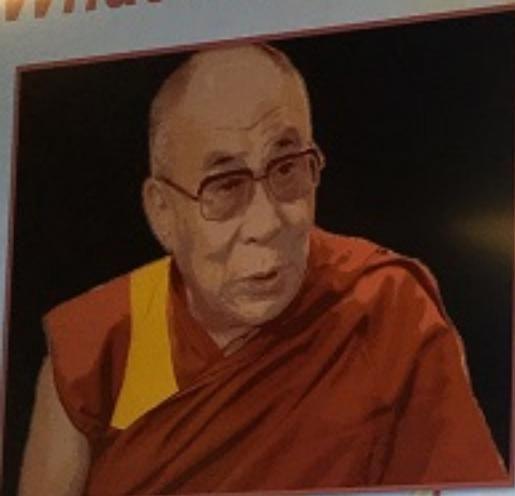
Opportunity

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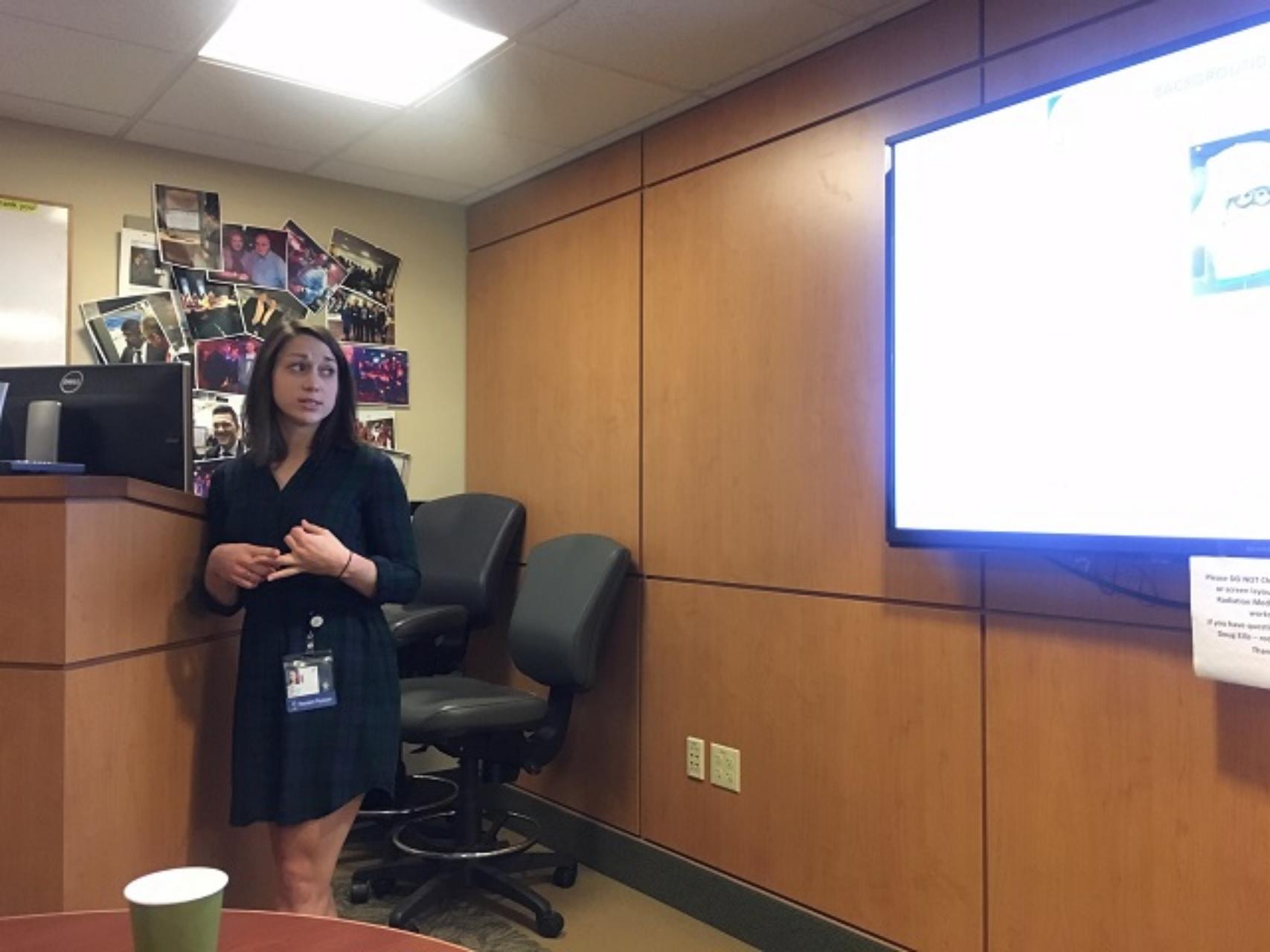
What can I learn?



*When you talk, you are only
repeating what you already know.*

*But if you listen, you may learn
something new.*

~ Dalai Lama



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Radiation Monitor
If you have questions
Doug Ellis - no