SUPPLEMENTARY TABLES

Supplementary Table 1: Preclinical and clinical reports using RT + Checkpoint inhibitors as per radiation dose and fractionation.

Radiation	Pre-clinical						Clinical					
	Cold tumor			Hot tumor			Cold tumor			Hot tumor		
	Tumor	ICI	Result	Tumor	ICI	Result	Tumor	ICI	Outcome	Tumor	ICI	Outcome
Low dose 0-2 Gy fractions							(Journal of Clinical Oncology 2019 37:8 _suppl, 49 -49) Metastatic microsatellite-stable CRC NCT02888743	αPD-L1 and αCTLA-4	No significant RT toxicity	(SITC, 2019) NSCLC NCT02888743	αPD-L1 and αCTLA-4	No significant RT toxicity. No benefit of adding RT.
Standard 2 Gy fractions	[1] CT-26 (colorectal)	αPD-L1	Improved survival	[1] 4434 (melanoma)	αPD-L1	Improved survival						
	[2] AT-3 (breast)	αCD137/□ αPD-1	All mice cured									
3-8.5 Gy fractions	[1] 4T1 (breast)	αPD-L1	Improved survival	[3] NSCLC	αPD-1	Long-term tumor control	[4] Prostate (bone-directed RT) NCT00861614	Ipilimumab or placebo	No significant difference between ipilimumab and placebo	Melanoma NCT02406183	Ipilimumb	No results posted
	[5] MC38 & C51 (colon)	αPD-1 + Cisplatin	Enhanced survival and abscopal effects	[6] Lung cancer	αPD-1	Increased lung injury score	(Journal of Clinical Oncology 2019 37:8 _suppl, 49 -49) Metastatic microsatellite-stable CRC NCT02888743	αPD-L1 and αCTLA-4	No significant RT toxicity. HFRT impacted local immune microenvironment.	(SITC, 2019) NSCLC NCT02888743	αPD-L1 and αCTLA-4	No significant RT toxicity. No benefit of adding RT.
										[7] Metastatic melanoma (lung or bone; liver or s.c.) NCT01497808	Ipilimumb	Patients with high PD-L1 did not respond
9-10 Gy fractions	GL-261 (Glioma)	[8] αPD-1	Improved long-term survival	[9] mEER (head & neck);	αPD-1/CTLA-4	Tumors not cleared	[10] MSS Colorectal NCT03007	Tremelimumab and	Safe and well tolerated; 2	Melanoma NCT02406183	Ipilimumb	No results posted

		[11] αPD-1 and αTIM-3	100% overall survival. Improved survival with αTIM-3 or αPD-1 with SRS	MOC2 (oral cancer); B16-F0 (melanoma)			407	durvalumab	PR			
		[12] αCTLA-4	Prolonged survival									
	[13] Colon	αCTLA-4	Prolonged survival									
	[14] Myc-CaP (prostate)	αPD-1/αPD-L1	Prolonged survival and robust abscopal effects									
12 Gy	[15] 4T1-HA (breast)	αPD-1	Enhanced tumor control	[15] B16-Ova (melanoma)	αPD-1	Enhanced tumor control				Melanoma NCT02406183	Ipilimumb	No results posted
	[16] 4T1 (breast)	αCTLA-4	Significant survival advantage and anti-metastatic effects	[5] B16-CD133 (melanoma)	αPD-1+cisplatin	Enhanced survival and abscopal effects						
	[17] TUBO (breast)	αPD-L1	Tumor regression and reduced growth of secondary tumors	[18] Bladder	αPD-L1	Longer tumor growth delay						
	[19] 4T1 (breast)	αVISTA/αPD-1	Delayed tumor growth and reduction in lung metastasis									
> 12 Gy ablative	[7] TSA (breast)	αCTLA-4	Improved anti-tumor response	[7] B16-F10 (melanoma)	αCTLA-4/PD-1/PD-L1	Improved anti-tumor response	Breast NCT02303366	MK-3475 (αPD-1)	Results not posted	[20] Melanoma brain metastasis NCT01176461 (unresectable) NCT01176474 (resectable)	Nivolumab	Brain metastasis control and overall survival prolonged
	[17] MC38 (colon)	αPD-L1	Tumor regression and reduced growth of secondary tumors	**DOI:** 10.1158/1078-0432.CCR-18-3518 3LL (lung)	*None	Significant tumor growth delay and increased survival. Increased infiltration of immune effector cells and decreased Tregs in irradiated tumors and secondary lymphoid organs.						
	[21] Panc02 (pancreatic) CT26 (colon)	αCTLA-4/PD-1	Cure									
	[22] Myc-CAP (prostate)	αPD-1/αPD-L1	Significant increase in survival									
	DOI: 10.1158/1078-0432.CCR-18-3518 4T1 (metastatic breast)	*None (RT to the whole lung)	Increased survival, suppression of pulmonary metastases									
Partial > 8 Gy				DOI: 10.1667/RR3819.1 LLC (lung)	*None (lattice RT)	Improved distant effects; induction of a robust IFN-γ and Th1						

						response; and down-modulation of Th2 function compared to whole-tumor irradiation						
Spatial > 12 Gy										doi: 10.7759/cureus.417 Metastatic melanoma	Pembrolizumab	Synergistic effect of high-dose GRID radiation as a primer for renewed, enhanced immunological response
Range of RT dose							[23] Cranial metastatic	αPD-1/PD-L1/CTLA-4	Reviewed	[23] Metastatic melanoma	αCTLA-4	Reviewed
							[24] Metastatic and non-metastatic breast cancer	Various	Reviewed	[23] NSCLC and other thoracic malignancies	αPD-1/PD-L1/CTLA-4	Reviewed
										[25] HNSCC	Various	Reviewed

*RT alone; effects on immune response were studied.

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Supplementary Table 2: Dose and fractions in immunotherapy combined modality

Dose Category	Dose size	Number of Fractions	Local Tumor control rate	Comments
Ablative	>20 Gy	1	98%	Radiosurgery / SARS Ablation; IM and ICD
	>10 Gy <20Gy	3-5 fraction	98%	SBRT Ablation; IM and ICD
Sub-ablative	>5 Gy <10 Gy	1	-	IM and ICD
	>5 Gy <10 Gy	3 to 5 fractions	-	IM and ICD

IM: Immuno-modulation; ICD: Immunogenic cell death