Cohort	Number	Age	Sex	Cancer Site	TNM Stage	Size (mm)	Prior Chemo	Prior Radiation	Pan-800 dose (mg)	Procedure
Cohort 1 (0.06 mg/kg)	1	49	M	Oral Cavity	rT0N3M0	40	Y	N	5.64	Marginal mandibulectomy with ND
	2	85	M	Cutaneous	rT0N2M0	40	N	Y	4.5	Modified radical level II-V
	3	38	F	Nasal Cavity	T4N0M0		N	N	3.888	Maxillectomy
Cohort 2A (LD+0.5 mg/kg)	4	56	M	Oral Cavity	rT1N0Mo	6	N	Y (Local)	28.15	Lip resection with ND and FF
	5	71	M	Oral Cavity	rT2N2M0	35	N	N	45.55	Partial glossectomy with ND
	6	52	M	Oral Cavity	T2N2M0	30	N	N	40.25	Glossectomy with ND
	7	71	M	Nasal Cavity	rT3N0M0	52	N	N	46.9	Maxillectomy with FF
	8	62	M	Oral Cavity	T2N0M0	24	N	N	35.3	Mouth Vestibule Lesion with ND and FF
Cohort 2B (LD+1.0 mg/kg)	9	78	M	Oral Cavity	T2N0M0	30	N	N	53.2	Hemiglossectomy with ND and FF
	10	32	M	Pharynx	rT2N0M0	30	Y	Y	67.5	Laryngectomy with ND and FF
	11	62	M	Oral Cavity	T2N0M0	30	N	N	62.7	Mandibulectomy with ND and FF
	12	49	M	Oral Cavity	T4N0M0	55	N	N	68.6	Glossectomy with ND and FF
	13	68	F	Oral Cavity	T3N2M0	45	N	N	61.5	Glossectomy with ND and FF
	14	56	M	Oral Cavity	T4N1M0	55	N	N	75.4	Glossectomy with ND and FF
	15	51	M	Oral Cavity	T4N2M0	40	N	N	94.8	Mandibulectomy with ND and FF
Cohort 3 (50 mg)	16	82	F	Oral Cavity	rT3N0M0	25	N	Y	50	Maxillectomy with FF
	17	46	M	Oral Cavity	T1N0M0	10	N	N	50	Hemiglossectomy with ND and FF
	18	69	F	Oral Cavity	T1N0M0	18	N	N	50	Buccal excision ND with FF
	19	52	F	Oral Cavity	T3N1M0	43	N	N	50	Glossectomy with ND and FF
	20	67	F	Oral Cavity	T2N0M0	28	N	N	50	Tonsillar pillars radical resection with ND and FF
	21	73	M	Oral Cavity	T3N2M0	55	N	N	50	Glossectomy with ND and FF

n = 21; LD = Loading Dose; ND = Neck Dissection; FF = Free Flap

Supplementary Figure 1: Patient and tumor characteristics.
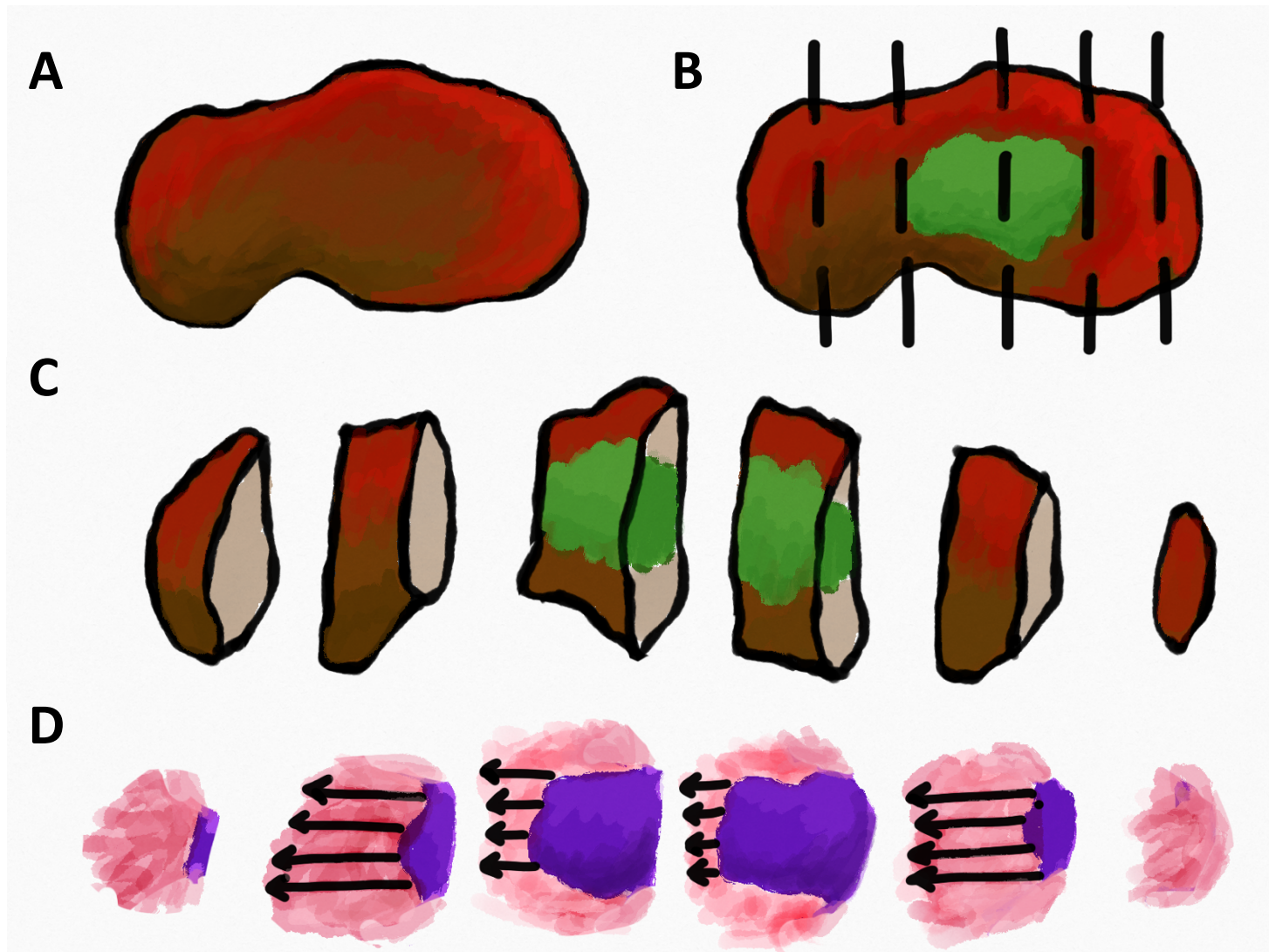
Supplementary Figure 2: Flow diagram of tumor-mapping analysis. The primary tumor specimen (A) is imaged using a closed-field fluorescence imaging device (B) and sectioned into breadloafs (C). H&E slides with areas of tumor tissue marked by a board-certified pathologist are analyzed, and tumor tissue distance to the deep margin surface is measured. Tumor depth in areas with fluorescence are compared to tumor depth in areas without fluorescence.

	Cohort 2A	Cohort 2B	Cohort 3
Sensitivity	100%	99%	95%
Specificity	61%	54%	62%
PPV	37%	14%	40%
NPV	100%	99%	98%

Supplementary Table 1: Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of fluorescence signal for areas of the primary tumor specimen with tumor tissue ≤ 1 mm from the deep margin surface given by cohort.

	Cohort 2A	Cohort 2B	Cohort 3
Sensitivity	94%	96%	86%
Specificity	66%	58%	65%
PPV	49%	27%	50%
NPV	97%	99%	92%

Supplementary Table 2: Sensitivity, specificity, PPV, and NPV of fluorescence signal for areas of the primary tumor specimen with tumor tissue $\leq$ 2 mm from the deep margin surface given by cohort.