## SUPPLEMENTARY MATERIALS for Maytin et al.

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### **SUPPLEMENTARY METHODS**

Analysis of Photographs to Obtain a DSE Composite Tumor Score

Photographic images were cropped and assembled in Adobe Photoshop, and displayed on a high resolution monitor (Apple iMac 21" Retina display). If the millimeter scale from the same photograph would be outside the field of view, it was copy-pasted to lie alongside each BCC lesion for comparison. In addition, an artificial color scale (with 7 different shades of red) was added to each photograph for an assessment of erythema.

Three separate measurements were then made by the primary evaluator (U.W.) to produce a descriptive, composite score. The procedure is illustrated in Figure 2. First, the lesion diameter (D) was estimated from the millimeter scale. (Any absent lesion was arbitrarily set at D=1). Second, we attempted to take into account the vertical disposition of the tumor; it is not possible to actually measure the depth of a tumor from a photograph, but some idea of the tumor activity (scaling, erosion, or elevation due to edema) can be obtained by noting epidermal surface changes. Therefore, the appearance of the lesion's surface (S) was evaluated and assigned a number (H = 2 if raised, eroded, or scaly; H=1 if flat). To assess erythema (E), the artificial color scale was compared to the tumor, and the nearest color match was recorded. Based upon 7 different shades of pink to red, it was possible to interpolate between the shades and choose a number from 0 to 14. Normal skin also has some degree of erythema; therefore color readings of normal skin were also recorded at three peritumoral locations, and an average background value was subtracted to obtain a background-corrected tumor erythema score. Using all three parameters, a composite score (DSE) was calculated by multiplying the three factors (D x S x E). In the Supplementary Tables A-C, one can see that tumors that were completely resolved at Visit 7 have a DSE composite score of zero or close to zero. (Negative values are due to variability introduced by the erythema background correction).

### Supplementary Table A. Lesion Diameter and Composite Scores for the BCC Tumors of Patient A

### **DSE Composite Scores** [2]

				Low fl	Low fluence Medium fluence		High fluence		No Rx		
Lesion No. (final)	Lesion No. (original)	Diameter (mm) <sup>[1]</sup>	Type of Light	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	Number of Treatments to Clear [3]
A1	Scalp-1	5	Blue	77	11	<u>3</u>	117	<u>5</u>	<u>3</u>	<u>1</u>	4
A2	Scalp-2	6	Blue	40	47	<u>5</u>	117	<u>5</u>	56	<u>1</u>	6
А3	Scalp-3	4	Blue	53	70	11	70	11	47	<u>1</u>	6
A4	Scalp-4	2	Blue	11	47	<u>3</u>	117	11	80	<u>1</u>	6
A5	Scalp-5	3	Blue	17	64	<u>3</u>	140	11	<u>7</u>	<u>1</u>	5
A6	Scalp-6	3	Blue	17	12	<u>3</u>	117	13	120	<u>1</u>	6
A7	Face-20	2	Blue	13	52	<u>1</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>3</u>	2
A8	Face-21	20	Blue	107	187	11	43	30	88	<u>1</u>	6
A9	Scalp-14	3	Red	12	32	<u>6</u>	<u>8</u>	<u>7</u>	160	<u>2</u>	6
A10	Scalp-15	4	Red	16	32	<u>6</u>	<u>6</u>	<u>7</u>	16	<u>2</u>	6
A11*	Scalp-16	3	Red	24	20	60	64	36	120	72	NR *
A12	Scalp-17	4	Red	24	24	12	48	15	154	<u>6</u>	6
A13	Face-10	5	Red	70	96	10	24	8	16	<u>4</u>	6
A14*	Face-12	4	Red	29	37	<u>1</u>	<u>3</u>	<u>5</u>	45	13	PR *
A15	Face-13	2	Red	22	32	<u>4</u>	18	<u>2</u>	<u>5</u>	<u>1</u>	4

### **FOOTNOTES TO SUPPLEMENTARY TABLE A.**

PR, partial response. NR, nonresponse. CR, complete response.

\* These lesions were biopsied with the following diagnostic results:

Lesion A11, right scalp: "BCC, nodular and micronodular types" (red light)

Lesion A14, right forehead: "BCC, nodular and micronodular types" (red light)

<sup>[1]</sup> Initial size of tumor (diameter, in millimeters).

DSE composite scores were calculated as product of (diameter) x (surface change) x (erythema). Numbers that are underlined correspond to lesions judged to be clinically undetectable on the day of that study visit. Numbers in **bold** indicate that the DSE score is above the DSE threshold of detection; the latter is defined as the mean of all the underlined DSE scores + 2 x (Std Dev). The threshold DSE score in this patient: mean ± 2 SD = **7.8** 

Number of PDT treatments needed to clear the lesion. To be defined as a complete response, the DSE score had to be below the DSE threshold of detection at visit 7, or if the DSE score was below the threshold at an earlier visit, it had to remain below threshold at all subsequent visits.

# Supplementary Table B. Lesion Diameter and Composite Scores for the BCC Tumors of Patient B DHE Composite Scores [2]

				Low fl	Low fluence Medium fluence		High fluence		No Rx		
Lesion No. (final)	Lesion No. (original)	Diameter (mm) <sup>[1]</sup>	Type of Light	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	Number of Treatments to Clear <sup>[3]</sup>
B1	Face-41	3	Blue	46	76	9	12	<u>1</u>	21	<u>1</u>	6
B2	Face-42	3	Blue	58	93	<u>3</u>	<u>4</u>	<u>1</u>	76	<u>1</u>	6
В3	Face-43	4	Blue	45	77	<u>3</u>	22	<u>1</u>	<u>5</u>	<u>1</u>	6
B4	Face-37	1	Blue	5	5	<u>1</u>	4	<u>1</u>	<u>-1</u>	<u>-1</u>	4
B5	Face-38	2	Blue	9	114	<u>1</u>	<u>4</u>	<u>1</u>	<u>-1</u>	<u>-1</u>	4
В6	Face-39	2	Blue	9	95	<u>3</u>	<u>4</u>	<u>1</u>	<u>-1</u>	<u>-1</u>	4
В7	Face-40	2	Blue	9	77	<u>3</u>	<u>4</u>	<u>1</u>	<u>-1</u>	<u>-1</u>	4
В8	Face-1	6	Red	30	157	42	25	<u>3</u>	69	<u>3</u>	6
В9	Face-2	3	Red	62	<u>4</u>	<u>4</u>	<u>6</u>	<u>2</u>	<u>4</u>	<u>2</u>	6
B10	Face-8	7	Red	77	90	31	114	<u>3</u>	<u>1</u>	<u>3</u>	4
B11	Face-9	7	Red	86	200	<u>4</u>	<u>3</u>	<u>3</u>	<u>o</u>	<u>2</u>	3
B12	Face-10	4	Red	18	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>6</u>	<u>2</u>	6
B13	Scalp-14	8	Blue	119	199	<u>3</u>	77	<u>3</u>	9	<u>1</u>	6
B14	Scalp-15	2	Blue	47	34	<u>3</u>	66	<u>3</u>	13	<u>1</u>	6
B15	Scalp-16	5	Blue	15	18	<u>1</u>	23	<u>1</u>	13	<u>-1</u>	6
B16	Scalp-17	5	Blue	42	50	4	74	<u>4</u>	10	<u>2</u>	6
B17	Scalp-18	7	Blue	21	18	<u>1</u>	119	<u>1</u>	9	<u>-1</u>	6
B18	Scalp-19	4	Blue	45	29	<u>3</u>	<u>3</u>	<u>1</u>	5	<u>-1</u>	6
B19	Scalp-32	4	Blue	29	49	<u>3</u>	4	<u>1</u>	<u>3</u>	<u>1</u>	4
B20	Scalp-33	6	Blue	18	49	<u>3</u>	<u>1</u>	<u>1</u>	<u>5</u>	<u>1</u>	6
B21	Scalp-34	6	Blue	90	114	<u>3</u>	49	15	62	<u>1</u>	6
B22	Scalp-35	5	Blue	35	130	<u>3</u>	42	<u>1</u>	62	<u>1</u>	6
B23	Scalp-36	5	Blue	55	23	<u>3</u>	22	<u>1</u>	22	<u>1</u>	6
B24	Scalp-3	3	Red	50	6	4	<u>6</u>	<u>2</u>	<u>2</u>	<u>2</u>	4
B25	Scalp-4	5	Red	62	74	4	<u>6</u>	<u>2</u>	4	<u>2</u>	6
B26 *	Scalp-5	7	Red	161	183	1	90	23	14	32	PR *
B27	Scalp-6	6	Red	102	46	<u>1</u>	31	<u>3</u>	<u>1</u>	<u>1</u>	4
B28	Scalp-7	5	Red	55	90	15	75	23	9	<u>1</u>	6
B29	Neck-28	6	Blue	66	75	<u>3</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>1</u>	4
B30	Neck-29	3	Blue	10	<u>3</u>	<u>3</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>1</u>	4
B31	Neck-30	8	Blue	87	77	<u>3</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>1</u>	4
B32	Neck-31	4	Blue	45	23	<u>3</u>	<u>4</u>	<u>3</u>	<u>1</u>	<u>1</u>	4
B33	Neck-11	6	Red	130	130	7	18	37	95	<u>1</u>	6
B34	Neck-13	5	Red	89	69	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>1</u>	2
B35	Neck-20	4	Red	45	75	5	<u>1</u>	<u>-1</u>	<u>-1</u>	<u>-1</u>	3
B36	Neck-21	4	Red	45	75	5	77	<u>1</u>	<u>-1</u>	<u>-1</u>	4
B37	Neck-22	5	Red	29	85	5	<u>3</u>	<u>1</u>	<u>-1</u>	<u>-1</u>	3
B38	Neck-23	5	Red	29	77	12	<u>3</u>	<u>1</u>	<u>1</u>	<u>-1</u>	3
B39	Neck-24	5	Red	55	45	9	<u>3</u>	<u>-1</u>	<u>-1</u>	<u>-1</u>	3
B40	Neck-25	4	Red	61	75	<u>3</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>1</u>	2
B41	Neck-26	3	Red	22	55	<u>3</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>1</u>	2
B42	Back-27	3	Red	50	8	6	<u>4</u>	<u>4</u>	<u>2</u>	<u>2</u>	5

### **FOOTNOTES TO SUPPLEMENTARY TABLE B.**

- [1] Initial size of tumor (diameter, in millimeters).
- DSE composite scores were calculated as product of (diameter) x (surface change) x (erythema). Numbers that are underlined correspond to lesions judged to be clinically undetectable on the day of that study visit. Numbers in **bold** indicate that the DSE score is above the DSE threshold of detection; the latter is defined as the mean of all the underlined DSE scores + 2 x (Std Dev). The threshold DSE score in this patient: mean  $\pm$  2 SD = 3.12
- [3] Number of PDT treatments needed to clear the lesion. To be defined as a complete response, the DSE score had to be below the DSE threshold of detection at visit 7, or if the DSE score was below the threshold at an earlier visit, it had to remain below threshold at all subsequent visits.

PR, partial response. NR, nonresponse. CR, complete response.

\* This lesion was biopsied with the following diagnostic result: Lesion B26, left scalp: "Basal cell carcinoma, nodular type" (red light)

## Supplementary Table C. Lesion Diameter and Composite Scores for the BCC Tumors of Patient C

## DSE Composite Scores [2]

				Low flu	fluence Medium fluence		High fluence		No Rx		
Lesion No.	Lesion No.	Diameter	Type of								Number of
(final)	(original)	(mm) [1]	Light	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	Treatments
	1										to Clear <sup>[3]</sup>
C1	Arm-8	3	Blue	38	93	8.7	<u>2.3</u>	<u>1.3</u>	<u>3.3</u>	<u>-0.7</u>	3
C2	Arm-9	3	Blue	13	133	26	6.7	10	10	<u>1.3</u>	6
C3	Arm-10	3	Blue	38	100	38	21	6.7	6.7	<u>-0.7</u>	6
C4	Arm-11	5	Blue	30	176	10	8.0	10	10	<u>-2.0</u>	6
C5	Arm-12	5	Blue	15	72	40	40	9.0	<u>4.0</u>	<u>2.0</u>	5
C6	Arm-13	2	Blue	12	80	8.0	12	<u>-2.0</u>	<u>0.0</u>	<u>-4.0</u>	4
С7	Arm-14	4	Blue	24	128	16	24	<u>-2.0</u>	<u>3.0</u>	<u>-2.0</u>	4
C8	Arm-15	6	Blue	80	92	80	47	7.3	6.7	<u>0.7</u>	6
С9	Arm-16	3	Blue	48	120	8.0	<u>2.0</u>	<u>3.0</u>	8.9	<u>0.0</u>	6
C10	Arm-17	5	Blue	90	144	7.0	5.0	<u>3.0</u>	<u>3.3</u>	<u>0.0</u>	3
C11 [5]	Arm-21	4	Blue	45	139	40	53	8.0	8.0	8.0	Benign [5]
C12	Arm-22	3	Blue	48	200	28	21	8	<u>1.0</u>	<u>0.0</u>	5 . [5]
C13 <sup>[5]</sup>	Arm-23	3	Blue	36	156	24	24	22	22	22	Benign [5]
C14	Arm-24	2	Blue	36	182	70	10	8	8	<u>2.0</u>	6
C15	Arm-25	3	Blue	90	192	35	28	14	<u>5.0</u>	<u>3.0</u>	5
C16	Arm-26	3	Blue	48	80	20	<u>3.0</u>	<u>0.0</u>	<u>-1.0</u>	<u>-2.0</u>	3
C17	Arm-27	3	Blue	56	68	22	44	<u>3.3</u>	11	<u>-0.7</u>	6
C18	Arm-1	3	Red	46	87	<u>-0.3</u>	<u>1.3</u>	<u>-2.3</u>	<u>-2.3</u>	<u>0.7</u>	2
C19	Arm-2	3	Red	11	113	11	37	<u>-2.3</u>	<u>1.7</u>	<u>0.7</u>	4
C20	Arm-3	4	Red	53	210	53	107	11	93	<u>0.7</u>	6
C21 C22	Arm-4	3 6	Red	26	168	44	32	<u>-7.3</u>	<u>0.3</u>	<u>-0.7</u>	4
C22	Arm-5	3	Red	76 26	112 93	28 33	43 64	10 13	32 17	<u>1.3</u>	6
C23	Arm-6 Arm-7	4	Red Red	29	69	45	44	11	15	<u>-0.7</u> -1.3	6 6
C25 <sup>[4]</sup>	Arm-8	4	Red	64	108	42	48	18	288	16	PR <sup>[4]</sup>
C26	Arm-19	6	Red	40	67	20	20	9.0	6.6	<u>-0.7</u>	6
C27	Arm-20	3	Red	33	35	10	10	-1.7	3.0	-2.7	4
C28	Leg-1	7	Blue	107	128	67	4.7	19	<u>3.0</u> 47	-1.3	6
C29	Leg-2	10	Blue	133	233	67	87	4.7	15	4.7	6
C30	Leg-3	5	Blue	87	140	52	40	5.3	26	4.7	6
C31	Leg-4	4	Blue	69	69	52	20	5.3	6.7	<u>0.7</u>	6
C32	Leg-5	6	Blue	80	149	80	11	69.3	128	4.7	6
C33	Leg-6	5	Blue	33	77	9.4	2.7	2.7	0.7	<u>0.7</u>	3
C34	Leg-7	7	Blue	93	171	9.3	4.7	5.3	6.7	0.7	6
C35	Leg-8	2	Blue	19	46	11	9.3	5.3	5.3	0.7	4
C36	Leg-9	5	Blue	47	38	2.7	11	19	31	4.7	6
C37	Leg-10	5	Blue	47	128	40	68	14	5.3	<u>2.7</u>	5
C38	Leg-11	2	Blue	7.3	128	5.3	5.3	<u>1.7</u>	<u>1.7</u>	0.7	2
C39	Leg-12	4	Blue	27	53	<u>1.3</u>	<u>1.3</u>	6.7	32	1.3	6
C40	Leg-13	5	Blue	43	112	51	32	10	17	4.7	6
C41	Leg-14	2	Blue	29	32	6.7	<u>1.3</u>	<u>-0.7</u>	<u>3.2</u>	<u>-0.7</u>	3
C42	Leg-15	4	Blue	51	88	6.7	<u>1.3</u>	<u>-0.7</u>	<u>-1.7</u>	<u>3.3</u>	3
C43	Leg-16	2	Blue	17	75	6.7	4.7	9.4	6.7	<u>3.3</u>	6
C44	Leg-17	3	Blue	36	50	42	10	4.0	5.0	<u>2.0</u>	4
C45	Leg-18	2	Blue	24	32	10	36	12	12	4.7	6
C46 <sup>[4]</sup>	Leg-19	5	Blue	50	60	50	48	64	72	24	PR <sup>[4]</sup>
C47	Leg-20	5	Blue	70	90	24	40	8.0	18	4.7	6

# Supplementary Table C (Continued)

DSE Composite Scores [2]

				Low flu	ience	Medium fluence		High fluence		No Rx	
Lesion No. (final)	Lesion No. (original)	Diameter (mm) <sup>[1]</sup>	Type of Light	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	No. of Tx's to Clear [3]
C48	Leg-21	4	Red	48	42	24	10	8.0	<u>2.0</u>	<u>0.0</u>	5
C49	Leg-22	4	Red	80	80	21	18	8.0	8.0	0.0	6
C50	Leg-23	8	Red	128	96	24	48	8.0	5.0	<u>0.0</u>	5
C51	Leg-24	4	Red	32	11	2.0	5.0	2.0	18	4.7	6
C52	Leg-25	2	Red	16	84	12	12	2.0	6.0	4.7	6
C53	Leg-26	4	Red	48	108	12	12	9.4	<u>0.0</u>	<u>2.0</u>	5
C54	Leg-27	7	Red	121	187	27	27	20	20.0	4.7	6
C55	Leg-28	3	Red	28	40	8.0	9.3	19	28.0	4.7	6
C56	Leg-29	5	Red	80	48	8.0	7.0	6.0	8.0	<u>2.0</u>	6
C57	Leg-30	5	Red	50	90	4.0	6.0	8.0	<u>2.0</u>	<u>2.0</u>	5
C58	Leg-31	4	Red	40	64	6.0	6.0	8.0	<u>2.0</u>	<u>2.0</u>	5
C59	Leg-32	4	Red	32	60	6.0	6.0	8.0	<u>2.0</u>	<u>2.0</u>	5
C60	Leg-33	5	Red	60	24	6.0	6.0	8.0	<u>2.0</u>	<u>2.0</u>	5
C61	Leg-34	3	Red	36	36	6.0	6.0	8.0	4.0	2.0	5
C62	Leg-35	4	Red	32	20	24	6.0	8.0	<u>2.0</u>	2.0	5
C63	Back-1	2	Red	11	31	23	15	6.6	6.6	<u>1.7</u>	6
C64	Back-2	5	Red	77	92	11	43	<u>-2.3</u>	24	<u>1.7</u>	6
C65	Back-3	3	Red	18	140	18	45	11	93	<u>0.0</u>	6
C66	Back-4	2	Red	32	42	<u>3.0</u>	25	<u>-7.3</u>	<u>0.3</u>	<u>0.0</u>	4
C67	Back-5	4	Red	20	84	<u>3.0</u>	6.0	<u>3.3</u>	32	<u>2.0</u>	6
C68	Back-6	2	Red	7.0	7.0	<u>1.0</u>	<u>1.0</u>	<u>4.0</u>	<u>3.0</u>	<u>0.0</u>	2
C69	Back-7	3	Red	36	128	<u>0.0</u>	<u>1.0</u>	<u>3.7</u>	<u>3.7</u>	2.0	2
C70	Back-8	4	Red	24	60	9.0	28	<u>1.3</u>	9.4	0.0	6
C71	Back-9	4	Red	40	48	6.0	54	<u>3.3</u>	<u>3.3</u>	<u>-2.0</u>	4
C72	Back-10	2	Red	10	28	<u>1.0</u>	<u>0.0</u>	<u>-2.3</u>	6.7	<u>-2.0</u>	6
C73	Back-11	6	Red	84	98	12	36	6.6	9.9	<u>-2.0</u>	6
C74	Back-12	3	Red	6.0	42	<u>1.0</u>	<u>-2.0</u>	<u>-2.3</u>	9.9	<u>-4.0</u>	6
C75 <sup>[4]</sup>	Back-13	4	Red	20	144	15	16	8.6	93	9.0	PR <sup>[4]</sup>
C76	Back-14	3	Red	36	70	6.0	12	11	<u>4.3</u>	<u>-4.0</u>	5
C77	Back-15	2	Red	10	126	5.0	42	6.6	32	<u>2.0</u>	6
C78	Back-16	2	Red	24	80	14	32	10	17	<u>6.0</u>	6
C79	Back-17	4	Red	28	72	20	54	13	15	<u>2.0</u>	6
C80	Back-18	4	Red	32	256	12	42	11	10	<u>4.0</u>	6
C81	Back-19	3	Red	48	128	18	80	17	10	<u>6.0</u>	6
C82	Back-20	2	Red	36	144	14	12	<u>3.3</u>	6.7	<u>4.0</u>	6
C83	Face-1	3	Red	7.0	147	<u>2.3</u>	4.3	13	<u>-2.3</u>	<u>-2.7</u>	5
C84	Face-2	2	Red	17	26	2.3	4.3	11	<u>1.7</u>	<u>-2.7</u>	5
C85	Face-3	2	Red	28	84	4.0	4.0	<u>1.3</u>	<u>1.2</u>	<u>0.0</u>	2
C86	Face-4	3	Red	27	80	4.0	5.0	<u>3.3</u>	<u>0.3</u>	<u>0.0</u>	2

#### FOOTNOTES TO SUPPLEMENTARY TABLE C.

- [1] Initial size of tumor (diameter, in millimeters).
- DSE composite scores were calculated as product of (diameter) x (surface change) x (erythema). Numbers that are underlined correspond to lesions judged to be clinically undetectable on the day of that study visit. Numbers in **bold** indicate that the DSE score is above the DSE threshold of detection; the latter is defined as the mean of all the underlined DSE scores + 2 x (Std Dev). The threshold DSE score in this patient: mean ± 2 SD = **6.1**
- [3] Number of PDT treatments needed to clear the lesion. To be defined as a complete response, the DSE score had to be below the DSE threshold of detection at visit 7, or if the DSE score was below the threshold at an earlier visit, it had to remain below threshold at all subsequent visits.

PR, partial response. NR, nonresponse. CR, complete response.

<sup>[4]</sup> These lesions looked suspicious and were biopsied with the following diagnostic results:

```
Lesion C25, arm (axillary fold): "BCC, micronodular" (red light)
Lesion C46, posterior calf: "BCC, superficial and nodular" (blue light)
Lesion C75, back: "BCC, nodular" (red light)
```

These lesions were flat and pink, with a normal epidermal surface at the last visit. They were biopsied with the following diagnostic results:

```
Lesion C11, arm: "telangiectasia and hyperkeratosis (benign)" (blue light)
Lesion C13, forearm: "capillary hemangioma (benign)" (blue light)
```

Lesions C11 and C13 were censored (not included as BCC tumors in the final analysis of CR's in Table II).