

# Fluorescence Measurement Method for Non-contact Healing Power

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**Abstract:** Since 2006, we have been working to develop new measuring methods for non-contact healing power, and have succeeded in constructing a biophoton measurement method and a gas measurement method using cucumber pieces as bio-sensors; the former measures biophotons emitted from cucumber pieces and the latter measures odor generated from them. This paper shows a third method to measure fluorescent material which is produced on the cut surfaces of the cucumber pieces. After gas measurements of cucumber pieces, we measured intensities of fluorescence emitted from the cut surfaces of cucumber pieces using band pass filters. There was a significant difference in fluorescence J values in the 562nm band between healing and blank tests ( $p = 0.005$ , two-tails, t-test,  $n = 32$ ). Also, fluorescence J values correlated negatively with gas J values only in healing tests. In both biophoton and gas methods, we found it was difficult to detect healing effects if in winter because winter cucumber fruits were not reactive. However, the fluorescence measurement method was considered useful even for winter cucumbers.

**Keywords:** bio-sensor, *Cucumis sativus* 'white spine type', fluorescence, non-contact healing, gas measurement method, J value

## 1. Introduction

Since 2006, we have been studying and developing new quantitative measuring methods for non-contact healing (bio-PK) power using pieces of cucumber fruits (*Cucumis sativus* 'white spine type') as bio-sensors. We have succeeded in developing a biophoton measurement method (2006) and a gas measurement method (2009); the former is used with biophotons emitted from cucumber pieces and the latter is used with odor generated from them.

Through our biophoton measurement method, we have reported that: biophoton intensities of experimental samples of cucumber pieces were larger than controls if healers did non-contact healing for 30 min to increase biophotons emitted from samples<sup>1-3</sup>); the difference of intensities between experiments and controls arose about 5 h after healing<sup>6</sup>) and the difference could be approximated by a chain reaction<sup>19</sup>); effects of non-contact healing differed from those of magnetic stimuli<sup>11-13,16</sup>); and one of the production mechanisms of biophotons was biosynthesis of green odor<sup>8,16</sup>).

Our gas measurement method originated from our study of biosynthesis of green odor. Cucumber gases consist of C9/C6 aldehyde and alcohol such as violet leaf

aldehyde and cucumber alcohol. Specific components of cucumber gases, which have a color reaction in short-term gas-measuring detector tube for ethyl acetate (141L, Gastec, Japan), were used for detection of healing effects in our gas method<sup>17</sup>). We have reported that there was a negative correlation between biophoton intensity and gas amount<sup>17</sup>). We were able to make the world's first quantitative measurements of spatial distributions of healing power around a human body using bio-sensors arranged at equal intervals<sup>22-26</sup>).

Both biophoton and gas methods are applications of the fact that cucumber pieces have good reactivity for non-contact healing.

We have tested and improved our developed methods, and also tried to develop some more new methods. In the present paper, we show a fluorescence measurement method to measure magnitude of healing power using the amount of fluorescence material produced on the surfaces of cut cucumber pieces.

If the cut plane of a cucumber cross section is irradiated with ultraviolet rays, blue-green fluorescence on the plane can be recognized with the naked eyes 24 h after cutting, although fluorescence cannot be recognized with the naked eyes just after cutting. In both our biophoton and gas methods, healers try to influence the cucumber's self-defense process against a wound. Thus, the cut plane of a cucumber piece is the most important place for detection of healing effects. Fluorescent material on the cutting plane is considered to be

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produced in connection with the cucumber's self-defense process. Therefore we expected that the healing effects also can be measured quantitatively if we measure the amount of fluorescent material produced on the cut surface of a cucumber piece.

## 2. Method

### 2-1 Measuring System for Fluorescence

Fluorescence measurements were done using a highly sensitive camera with an image-intensifier (I.I.) (C2400-47, Hamamatsu Photonics, wavelength: 280-650 nm, sensitivity: 60mA/W at 400nm) (Fig. 1). And the AquaCosmos software (Ver. 1.3, Hamamatsu Photonics) was used for system control and data analyses.

The center wavelengths of the band pass filters were 438.0 nm, 482.5 nm, 534.5 nm, 562.0 nm, and 624.0 nm (Techspec, Edmund Optics; full width at half maximum, 28-48nm; OD > 6).

Ultraviolet lamps (FL4LB-B, Panasonic; maximum wavelength, 352nm) were covered with UV-pass filters (U330, Hoya Candeo Optronics) and black cloths for light reduction because the brightness of the UV lamps was too large against the camera sensitivity.

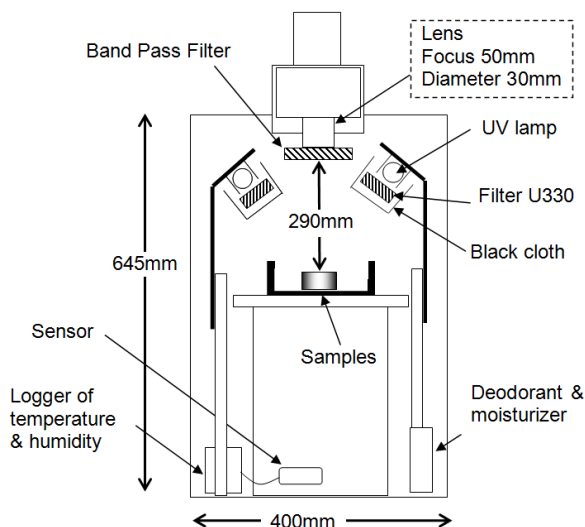


Fig. 1 Measuring System for Fluorescence

### 2-2 Healing Tests

Healing tests were done at the Institute for Living Body Measurement of the International Research Institute on October 30th and November 3rd 2011. Healers were a veteran healer H006 (female, 54 y) and a moderately experienced healer O004 (female, 37 y); we tested the former for the first time, while the latter had

showed a good result previously ( $J = 0.191$ ) in a gas test<sup>24,25</sup>. The  $J$  value is an index of magnitude of controlled healing power, and defined as the natural logarithm of the ratio of gas concentrations of an experiment and control<sup>17,1</sup>. Each healer was given explanations of the study and then signed a document of acceptance.

A trial took 30 min and a healer did non-contact healing to increase the odor from cucumber pieces in experimental sample dishes. Each healer did two trials with about a 15-min break between them. Sample dishes of cucumber pieces were prepared by SCAT (simultaneous calibration technique)<sup>20</sup>. During trials, control sample dishes and calibration sample dishes were kept in another room, and the distance was 12 m between the healer and these dishes. After 2 trials, all sample dishes were set into separate gas containers, and kept at room temperature (24 °C) for 24 h. The next day, we measured cucumber gas concentration in each container using gas detector tubes for ethyl acetate (141L) (gas measurements). Next, each pair of experimental and control dishes was set into a dark box, and fluorescence was measured for each 1 min at each wavelength band using the band pass filters and irradiating with ultraviolet rays. Then, the fluorescence  $J$  value, i.e., the natural logarithm of the ratio of fluorescence intensity of each sample pair, was calculated from the fluorescence intensity per unit pixel. Moreover, in order to cancel any effect from the unevenness of lighting, the position of the sample dishes was changed and another measurement was made. The average of the fluorescence  $J$  values was defined as the measured  $J$  value.

### 2-3 Blank Tests

Blank tests were done on November 13th and December 17th, 2011. The tests were made under the same conditions as above, except that there was no healer and 2 trials were done simultaneously.

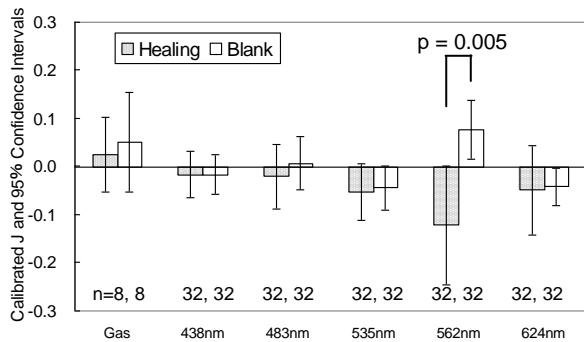
## 3. Results

Table 1 and Fig. 2 show calibrated  $J$  values of gas and fluorescence measurements and the approximate ratio of S/N of fluorescence. There was a statistically significant difference of fluorescence  $J$  values between healing and blank tests in the 562 nm band ( $p = 0.005$ , t-test, two-tailed,  $n = 32$ ).

Table 2 shows correlation coefficients  $r$  between calibrated gas and fluorescence  $J$  values and those  $p$  values. We found weak negative correlations in 438 nm, 483 nm and 562 nm bands only in the healing tests.

**Table 1 Calibrated J values and Fluorescence S/N**

	gas	438 nm	483 nm	535 nm	562 nm	624 nm
n	8	32	32	32	32	32
Healing	0.025	-0.017	-0.021	-0.053	-0.122	-0.049
Blank	0.051	-0.018	0.007	-0.044	0.076	-0.042
P value	0.309	0.992	0.522	0.808	0.005	0.895
S/N		2.5-3	2-2.4	0.8-1.6	1.1-1.3	0.1-0.2



**Fig. 2 Calibrated J values of Gas and Fluorescence**

**Table 2 Correlation coefficients r and p values**

		438nm	483nm	535nm	562nm	624nm
healing	r	-0.492	-0.362	0.104	-0.429	-0.325
	p	** 0.004	* 0.041	0.570	* 0.014	0.070
blank	r	0.263	0.018	0.339	-0.004	0.112
	p	0.146	0.924	0.058	0.981	0.541

\* p < 0.05    \*\* p < 0.01

#### 4. Discussion

Healing tests were done by veteran healers who seemed to have strong power. However, the gas J values of the cucumbers were small. One of the reasons was that cucumber fruits were not reactive because the tests were done in late autumn and early winter. Factors affecting cucumber reactivity have not been identified yet, but we can consider that there are several reaction systems related to gas generation, and some of them, especially sensitivity for healing effects, would become inactive in winter. A major candidate for such factors is the amount of enzymes which changes depending on the length of daylight.

In fluorescence measurements, we can say that the measurement of healing power is possible even if in winter, because there was a significant difference in J values between healing and blank tests in the 562 nm

band. There is a possibility that we can measure the magnitude of healing power all year round by the fluorescence method although both biophoton and gas methods are not useful in winter. Moreover, there is a possibility that success or failure of detection of healing power can be judged by the correlation existence because there were significant correlations only in healing tests. Further tasks are to obtain all year data, to decide a conversion coefficient between gas and fluorescence J values, to identify the fluorescence material, and to study the related biochemical systems.

In the present study, the S/N ratio of fluorescence is not large. However, it can be improved through revision of our measuring system and conditions.

Fluorescence J values of blank tests did not seem to be equal to zero at 535 nm, 562 nm and 624 nm wavelengths. There is a possibility that they are reflections of various specific factors of our experimental room, such as temperature, lighting, background potential<sup>18)</sup> etc. However, more data are needed to discuss this possibility.

#### 5. Conclusion

We can measure effects of non-contact healing through measurements of fluorescence material which is produced on the surface of cut cucumber pieces.

Our fluorescence measurement method is considered as useful all year round although our biophoton and gas methods are not because winter cucumber is inactive.

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