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Department of Molecular and Developmental Medicine

The study report was written pursuant to a Contract dated 2-10-2018 and 17-10-2018, between the University of Siena and Light Progress

Report (version 1.0)

Siena, 11th September 2020

TEST ON *UV-PENTALIGHT AT 3.5M* BY LIGHT PROGRESS

INDEX

TARGET

To assess the effectiveness of the Light Progress UV-PENTALIGHT in inactivating selected bacterial isolates at fixed distance and three exposure times.

OPERATIVE SPHERE

The tests were requested by Light Progress and conducted by qualified staff under the supervision of Prof. Gabriele Messina, affiliated with the Department of Molecular and Developmental Medicine, University of Siena where the tests took place.

EQUIPMENT

- **Light Progress UV-PENTALIGHT** (Image 1;2;3 and 4)
- **50 ml Falcon centrifuge**
- **Plate Count Agar**
- **Stainless Steel carriers of 20 cm^2**
- **Sterile 90 mm Ø disposable Petri dishes** for *bacterial* cultures
- **D/E neutralizing broth medium** for recovery phase
- **Microorganisms:** *Pseudomonas aeruginosa ATCC 27853; Escherichia coli ATCC 8739; Staphylococcus aureus ATCC 43300; Salmonella typhimurium ATCC 23853; Klebsiella pneumoniae ATCC BAA-1705*
- **Inoculum carriers:** 20 cm^2 Stainless steel carriers
- **Bio Class thermostat bath, Velp vortex mixer, Kartell hot plate, laminar flow hood with HEPA BIO/4 filter, KW Refrigerator +2 to +8°C, Sartorius precision balance, Nichipet EX micropipette, KW and Isco temperature chambers, Fedegari sterilising autoclave, Sigma phosphate buffered saline (PBS), sterile polypropylene tubes, sterile spatula, sterile pliers, sterile glass bottles, various glassware, centrifuge**
- **Microsoft Excel 2016** for data collection
- **Stata SE/16.0** for statistical analysis

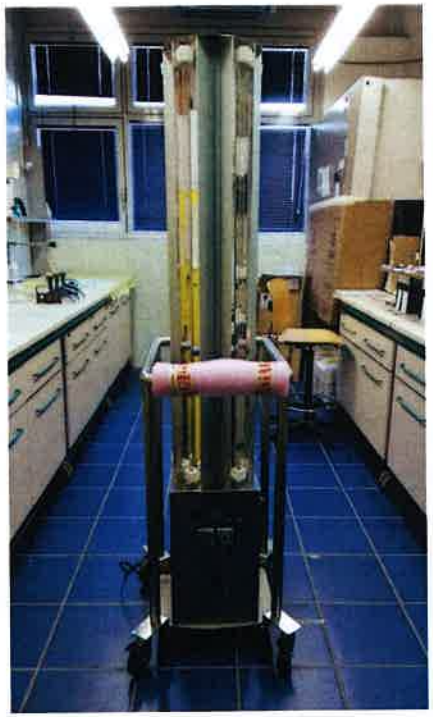

Image 1 Light Progress UV PENTALIGHT

Image 2 Light Progress UV PENTALIGHT control panel

Image 3 Light Progress UV PENTALIGHT: lateral view

Image 4 Light Progress UV PENTALIGHT: UV-C ON

PARAMETERS ESTABLISHED FOR THE TESTS

Exposure timed: 4, 7 and 10 minutes
Distance from source: 3.5 m
Repetitions: testing was performed three times in triplicate between August and September 2020
Concentrations: $1.5x10^7$; $1.5x10^6$ CFU/mL

OPERATIVE TECHNIQUE

Propagation of the microorganisms was conducted according to standard operating procedure (ANNEX 1 for details, separate document).
The inoculum was re-suspended in test culture at concentrations of approx. $1.5x10^6$ and $1.5x10^7$ CFU/mL.

Set Up
Stainless steel carriers were inoculated with 100 µl of test culture. The inoculum was spread with a sterile spatula over approximately 20 cm^2 of each carrier and left to dry inside the laminar flow hood.

Carriers were placed in the room as follow:
1) Treated sample: 2 vertical supports (1 per bacterial concentration) facing the device light source.
2) Positive control: 2 supports (1 per bacterial concentration) out of the device range.

At the end of the exposure, both exposed and non-exposed carriers were transferred to 90 mm Petri dishes and 10 mL D/E medium was added. Subsequently, the D/E medium was transferred to a 50 mL Falcon centrifuged and spund for 40 minutes at 4500 rpm. The supernatant was eliminated and the pellet re-suspended in 1 mL D/E medium. Finally, 100 µl was transferred to Plate Count Agar and incubated at 36°C for 48 h.

DATABASE ORGANIZATION

The following variables collected during the study were entered in a database:

- Petri dish ID
- CFUs/mL
- Microorganism species
- Inoculum concentrations

DATA ANALYSIS AND STATISTICS

Data analysis and statistical computations were supervised by Prof. Gabriele Cevenini, Department of Medical Biotechnologies, Laboratory of Applied Bioengineering – IT Engineering in Medicine, University of Siena. The Microsoft Excel software (ver. 16) was used for preliminary statistical evaluations of empirical data and to organize the database for model design. Analysis were conduced using Stata software Ver 16. The results of each experiment in triplicate were expressed as mean CFU/mL for each test. The mean logarithmic reduction and the 95% confidence interval were evaluated from the replicates data of each microbe. The tables created show the mean logarithmic reduction in CFU/mL of each microorganism compared to the real positive controls (Tables A) and theoretical positive controls (Tables B), as maximum number of CFU/mL ($1.5x10^7$ CFU/mL and $1.5x10^6$ CFU/mL).

RESULTS

The results for the different microorganisms are shown in Tables 1A to 5B.

Table 1A. *Staphylococcus aureus* ATCC 43300 CFU/mL logarithmic reduction (real positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	3.60	3.38 - 3.82	3.40	3.31 - 3.48	4.18	3.66 - 4.69	3.82	3.55 - 4.09	4.79	4.34 - 5.24	4.73	4.06 - 5.41

Table 1B. *Staphylococcus aureus* ATCC 43300 CFU/mL logarithmic reduction (theoric positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	3.66	3.42 - 3.91	3.46	3.41 - 3.52	4.24	3.80 - 4.68	3.88	3.54 - 4.22	4.85	4.45 - 5.25	4.80	4.06 - 5.54

Table 2A. *Escherichia coli* ATCC 8739 CFU/mL logarithmic reduction (real positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	5.36	3.50 - 7.22	4.44	2.65 - 6.22	5.18	4.43 - 5.94	6.26	6.26 - 6.26	5.80	5.48 - 6.11	6.26	6.26 - 6.26

Table 2B. *Escherichia coli* ATCC 8739 CFU/mL logarithmic reduction (theoric positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	5.58	3.72 - 7.44	4.66	2.88 - 6.44	5.41	4.65 - 6.17	6.48	6.48 - 6.48	6.02	5.71 - 6.33	6.48	6.48 - 6.48

Table 3A. *Pseudomonas aeruginosa* ATCC 27853 CFU/mL logarithmic reduction (real positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	5.71	4.86 - 6.56	5.59	4.75 - 6.43	6.49	5.53 - 7.45	5.59	4.75 - 6.43	7.02	6.16 - 7.88	6.02	5.16 - 6.88

Table 3B. *Pseudomonas aeruginosa* ATCC 27853 CFU/mL logarithmic reduction (theoric positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	5,73	4,86 - 6,60	5,61	4,76 - 6,46	6,51	5,55 - 7,47	5,61	4,76 - 6,46	7,04	6,19 - 7,89	6,04	5,19 - 6,89

Table 4A. *Salmonella typhimurium* ATCC 23853 CFU/mL logarithmic reduction (real positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)		$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)		$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	4.85	3.47 - 6.23	4.83	3.27 - 6.38	5.13	4.07 - 6.20	5.40	4.52 - 6.28	6.26	4.27 - 8.25	5.84	4.97 - 6.70

Table 4B. *Salmonella typhimurium* ATCC 23853 CFU/mL logarithmic reduction (theoric positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)		$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)		$1,5x10^7$ (CFU/mL)		$1,5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	5.05	3.68 - 6.43	5.03	3.48 - 6.59	5.34	4.29 - 6.39	5.61	4.76 - 6.46	6.47	4.49 - 8.45	6.04	5.19 - 6.89

Table 5A. *Klebsiella pneumoniae* ATCC BAA-1705 CFU/mL logarithmic reduction (real positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	3.75	3.26 - 4.23	3.53	2.97 - 4.09	3.99	3.79 - 4.19	4.14	3.66 - 4.62	4.24	4.12 - 4.36	5.02	3.60 - 6.45

Table 5B. *Klebsiella pneumoniae* ATCC BAA-1705 CFU/mL logarithmic reduction (theoric positive control reference)

	4 minutes				7 minutes				10 minutes			
	$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)		$1{,}5x10^7$ (CFU/mL)		$1{,}5x10^6$ (CFU/mL)	
	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI	mean	95% CI
Log_{10} reduction	3,93	3,43 - 4,43	3,71	3,15 - 4,27	4,18	3,96 - 4,39	4,32	3,83 - 4,82	4,42	4,31 - 4,54	5,21	3,79 - 6,63

DISCUSSION AND CONCLUSIONS

The inoculum spread on the steel plates was coherent with those described in the literature and proposed by the manufactured.

The Light Progress UV-PENTALIGHT at 3.5 m from the target has a biocidal effect, on all microbes, at exposition of 4, 7 and 10 minutes.

The higher bacterial inactivation effect, 4-7 $\log_{10}$ reduction for the higher tested concentration and 4-6 $\log_{10}$ reduction for lower tested concentration, was achieved at 10 minutes of exposure.

Different concentrations and dilutions on the carriers could produce different results (see ANNEX 1 for details, separate document).

Different distances and exposure times could produce different results (see ANNEX 1 for details, separate document).

REFERENCES

ALTMAN, D.G., 1990: *PRACTICAL STATISTICS FOR MEDICAL RESEARCH*, CHAPMAN AND HALL/CRC.

BOYCE J.M., DONSKEY C.J. UNDERSTANDING ULTRAVIOLET LIGHT SURFACE DECONTAMINATION IN HOSPITAL ROOMS: A PRIMER; INFECT CONTROL HOSP EPIDEMIOL. 2019 SEP;40 (9):1030-1035. DOI: 10.1017/ICE.2019.161. EPUB 2019 JUN 18.

EVERITT, B. AND PALMER, C.R., 2006: *ENCYCLOPAEDIC COMPANION TO MEDICAL STATISTICS*, HODDER ARNOLD.

KOWALSKI, W., 2009: ULTRAVIOLET GERMICIDAL IRRADIATION HANDBOOK: UVGI FOR AIR AND SURFACE DISINFECTION, SPRINGER.

NICOLETTI, G. AND NICOLOSI, V.M., 1998: *DIZIONARIO DI BATTERIOLOGIA UMANA NORMALE E PATOLOGICA*, MOMENTO MEDICO, MILAN.

ZIMBRO, M.J. ET AL., 2009*: DIFCO & BBL MANUAL –MANUAL OF MICROBIOLOGICAL CULTURE MEDIA*- SECOND EDITION.

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Prof. Gabriele Messina

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CERTIFICATO

TÜV AUSTRIA

per il sistema di gestione secondo
EN ISO 9001:2015

La comprova dell'applicazione conforme ai criteri normativi è stata conseguita e viene attestata secondo la procedura TÜV AUSTRIA CERT per

Università degli Studi di Siena
Dipartimento di Medicina Molecolare e dello Sviluppo
EpidMol

Sede legale:
IT-53100 Siena (SI), Via Banchi di Sotto, 55

Sede operativa:
IT-53100 Siena (SI), Via Aldo Moro, 2

Campo di applicazione

Titolazioni di anticorpi mediante analisi sierologiche; diagnosi microbiologiche; analisi epidemiologiche; determinazioni chimico/biologiche ambientali.

N° registrazione certificato: 20100193005061

Valido fino al 2022-02-05
Prima certificazione: 2019-02-06

Organismo di Certificazione
del TÜV AUSTRIA CERT GMBH

Vienna, 2019-02-06

Questa certificazione è stata eseguita secondo la procedura TÜV AUSTRIA CERT per verifiche e certificazioni e viene periodicamente sorvegliata.
TÜV AUSTRIA CERT GMBH Deutschstraße 10 A-1230 Wien www.tuv.at

Online Verification

000391-18-4

The study report was written pursuant to a Contract dated 2-10-2018 and 17-10-2018, between the University of Siena and Light Progress

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ANNEX 1

Report (version 1.0)

TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Notes:

- *the resolution of the images may be low and it may appear that the colonies do not correspond correctly to the attributed count on the Petri dishes.*
- *In some Petri dishes, on the image, you can see that 0 colonies were counted (with a marker) and find some growth instead. The zero identified the first 24 hour incubation count. The final indicated number refers to the 48 hour count.*
- *In some petri dishes some imperfections in the agar (e.g. micro bubbles, condensation) could be mistaken for colonies. The number of colonies is always indicated on / beside the Petri dishes.*

MICROBES

- *Pseudomonas aeruginosa ATCC 27853*
- *Escherichia coli ATCC 8739*
- *Stafilococco aureus ATCC 43300*
- *Salmonella Typhimurium ATCC 23853*
- *Klebsiella pneumoniae ATCC BAA-1705*

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Operative Protocol

Light Progress Experiments: UV PENTALIGHT

- Prepare a 0.5 McFarland inoculum of the bacterial strain (use PBS solution to suspend the colonies).
- Prepare two dilution of the inoculum: 1x10^8 and 1X10^7 (use PBS solution for the dilutions).
- Spread 100 µl of each dilutions on the stainless-steel carriers.
- Place 1 supports for each strain dilutions inside the UV device (TREATED SAMPLES).
- Place 1 more supports (1 *per* strain dilutions) out of the device range (POSITIVE CONTROLS).
- Set the times in minutes and start the exposure.
- At the end of the exposure, transfer both the exposed and non-exposed supports into 90 mm Petri dishes and add 10 ml of D/E medium.
- After initial shake, let the carrier inside the petri dishes with the medium for 10 minutes.
- Transfer the D/E medium to a 50 ml Falcon and centrifuge for 40 minutes at 4500 rpm.
- Eliminate the supernatant and suspend the pellet in 1 ml of initial D/E medium.
- Transfer 100 µl to a Plate Count Agar and spread until dry (colony count have to be multiplied by 10 considering that we take 1/10 of 1ml).
- Incubate the plates at 36°C for 48h.

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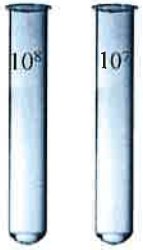
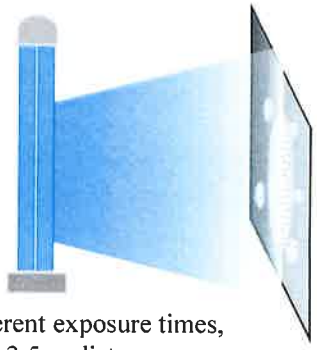
SCHEMATIC PROCEDURE

0,5 McF bacteric suspension

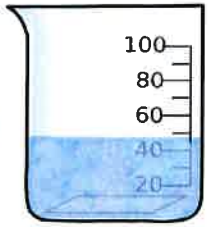


10^7, 10^8 diluitions in PBS

100 µL of bacteric suspension on steel carrier. Let dry under the hood



Different exposure times, 3.5 m distance



Resuspension in 10 mL of D/E medium

centrifuged for 40 minutes at 4500 rpm

100 µl transferred to a Plate Count Agar and spread until dry

plates incubated at 36°C for 48h

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

the following photos represent an example of petri dishes from each experiment

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Stafilococco aureus ATCC 43300:
First test

Concentrations:
- 1x10^7 CFU/mL
- 1x10^6 CFU/mL

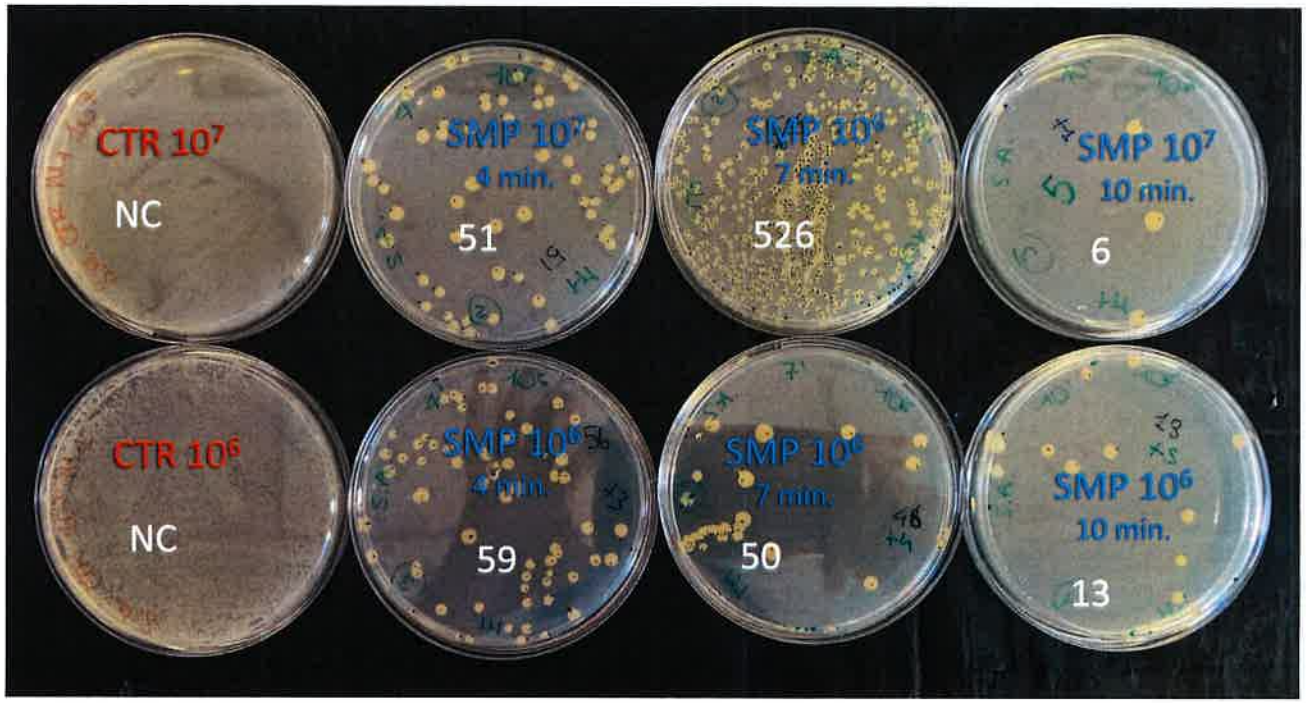
Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable



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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Escherichia coli ATCC 8739:
First test

Concentrations:
- $1x10^7$ CFU/mL
- $1x10^6$ CFU/mL

Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
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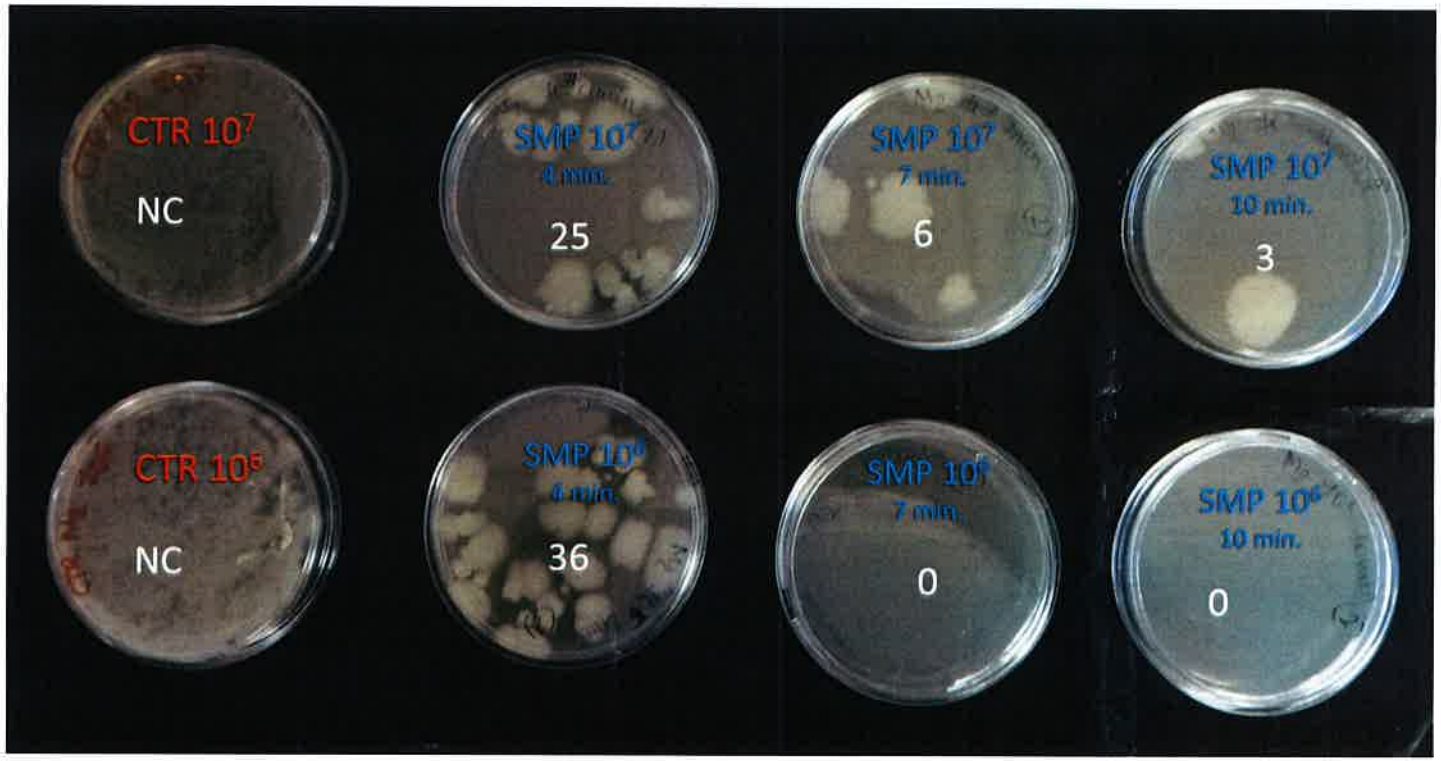

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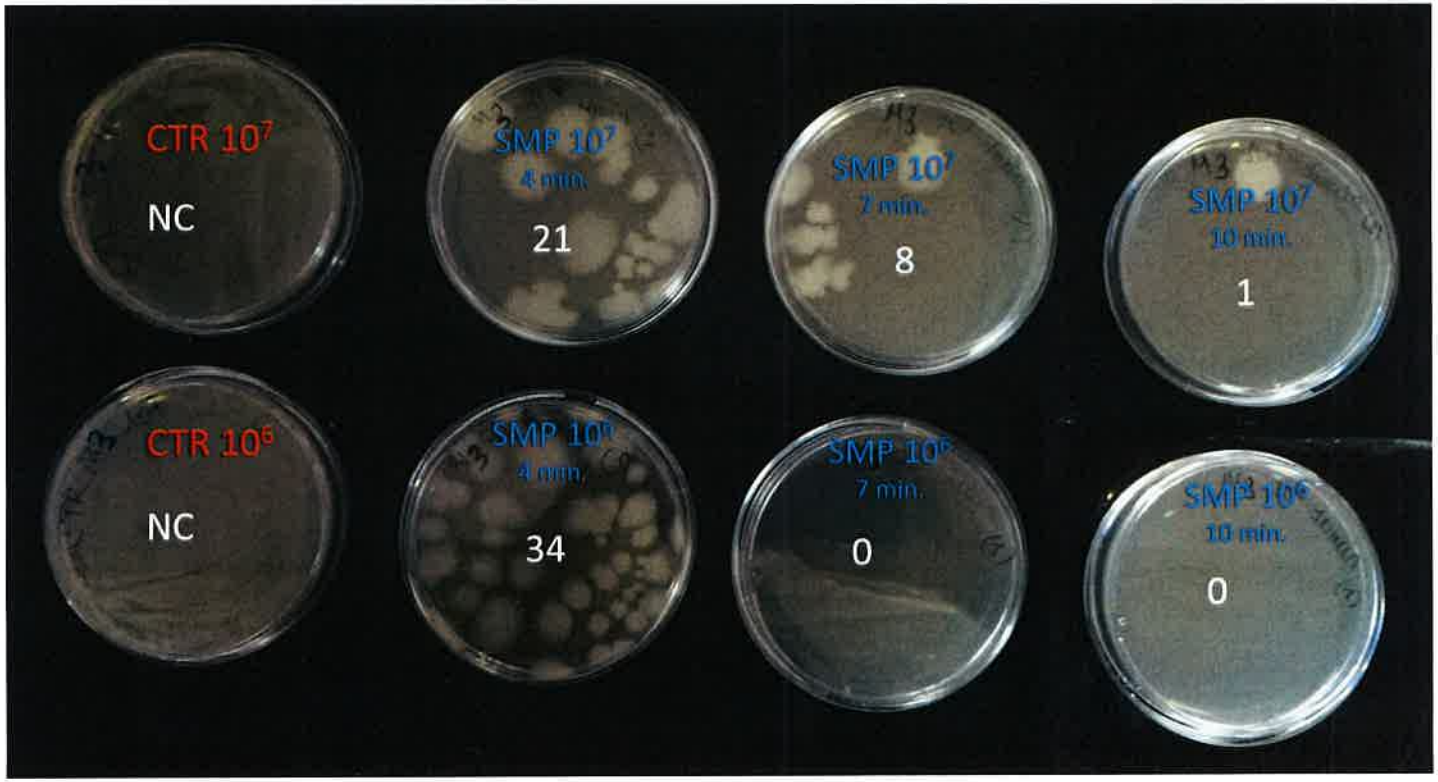

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Pseudomonas aeruginosa ATCC 27853:
First test

Concentrations:
- 1x10^7 CFU/mL
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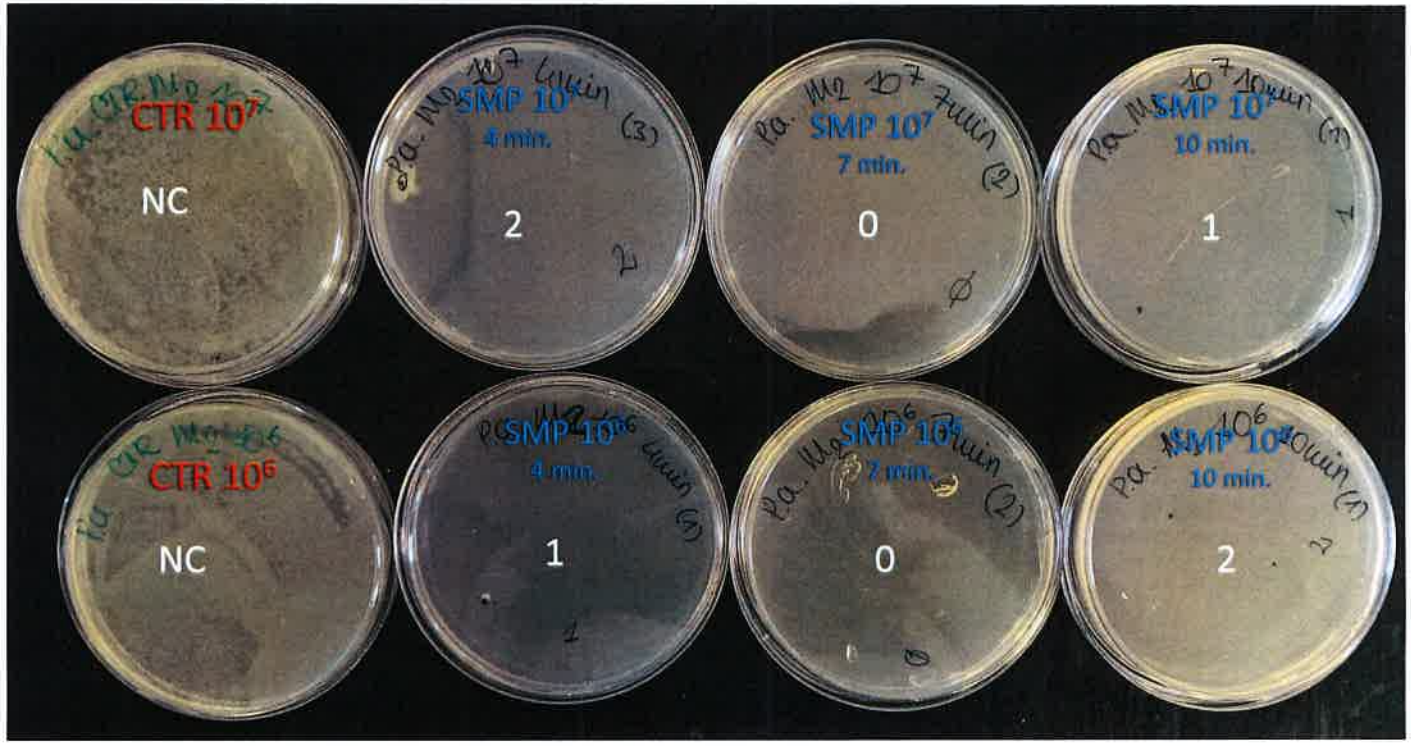

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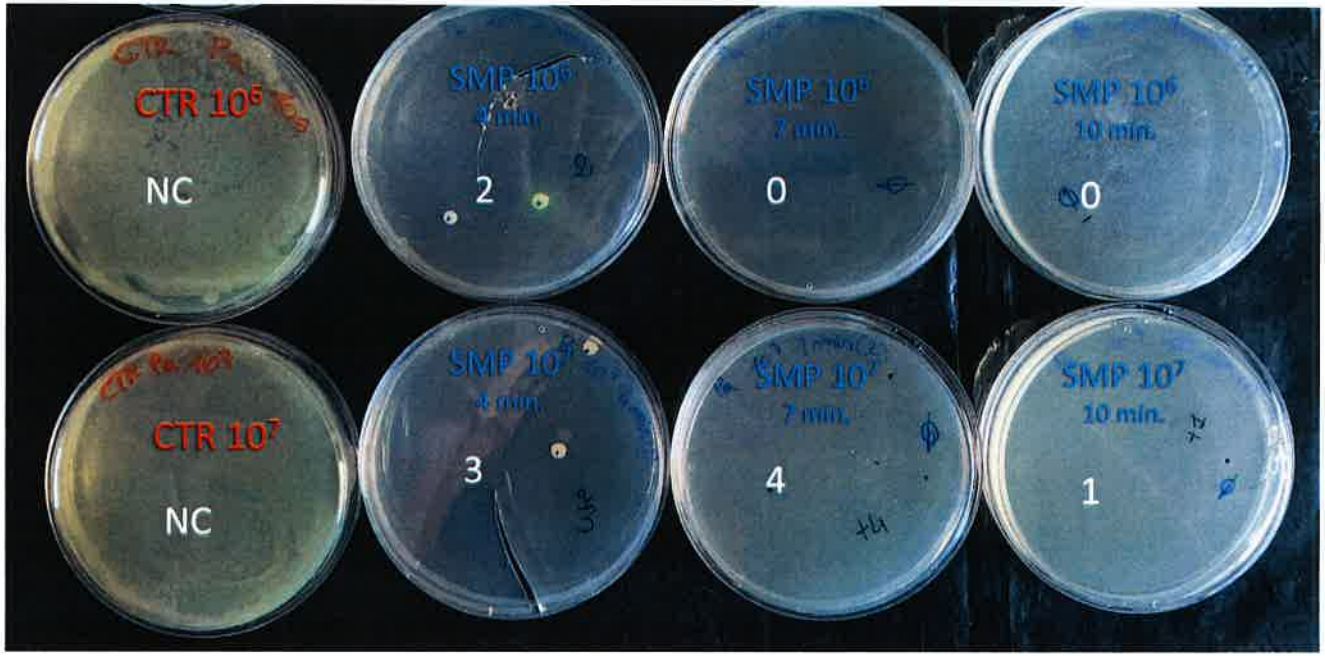
CTR: Positive Control
NC: Not Countable



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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Salmonella typhimurium ATCC 23853:
First test

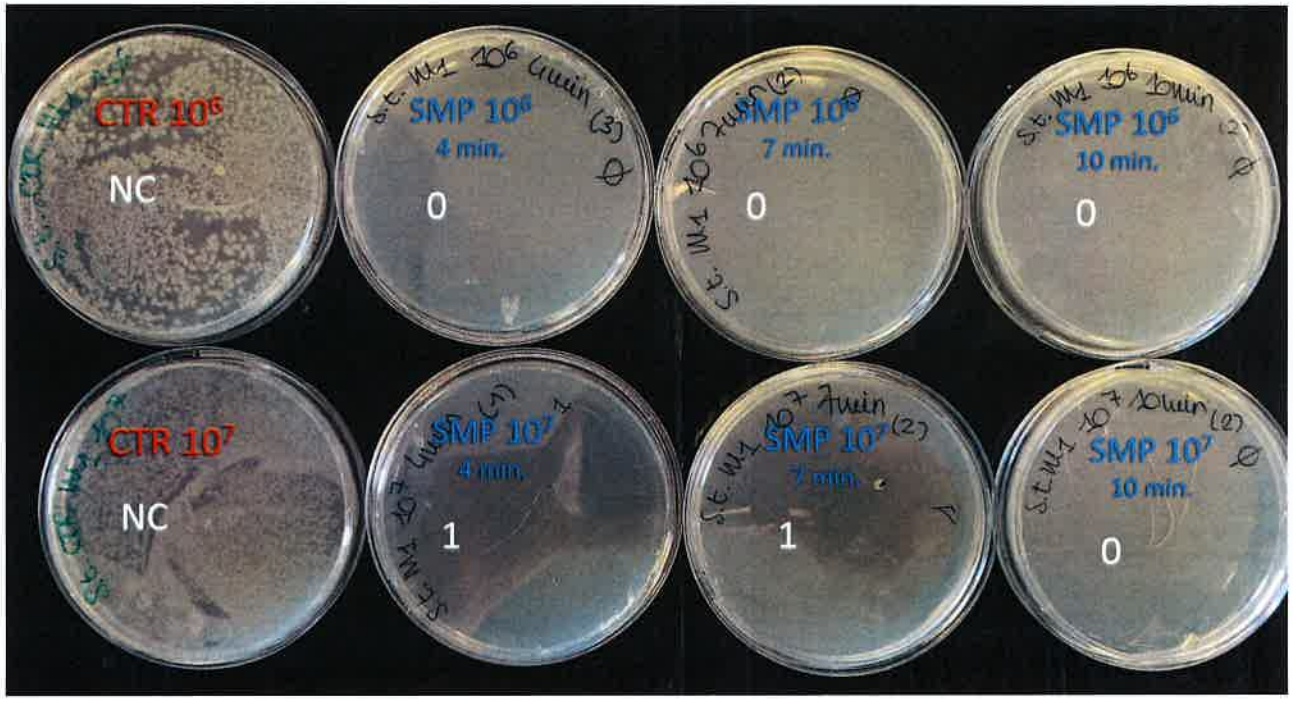
Concentrations:
- $1x10^7$ CFU/mL
- $1x10^6$ CFU/mL

Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h



SMP: Sample
CTR: Positive Control
NC: Not Countable

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Salmonella typhimurium ATCC 23853:
Second test

Concentrations:
- 1x10^7 CFU/mL
- 1x10^6 CFU/mL

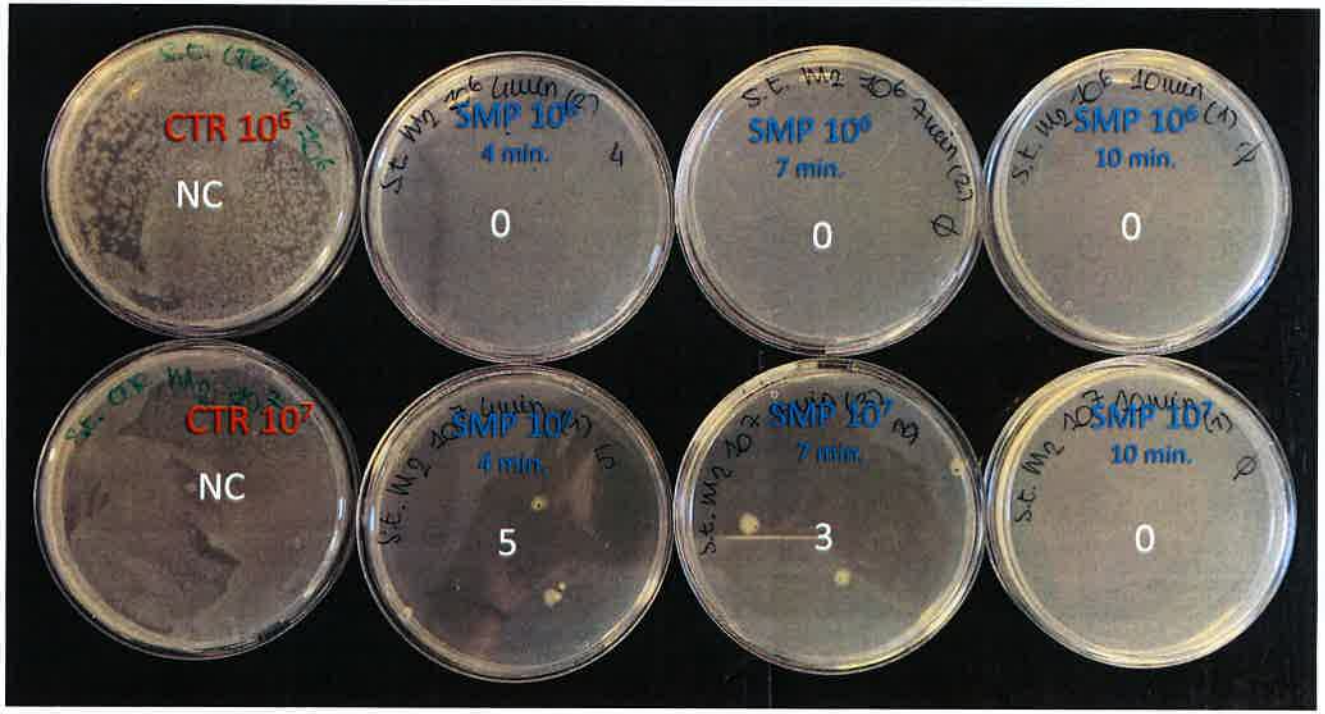
Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable



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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Salmonella typhimurium ATCC 23853:
Third test

Concentrations:
- $1x10^7$ CFU/mL
- $1x10^6$ CFU/mL

Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Klebsiella pneumoniae ATCC BAA-1705:
First test

Concentrations:
- 1x10^7 CFU/mL
- 1x10^6 CFU/mL

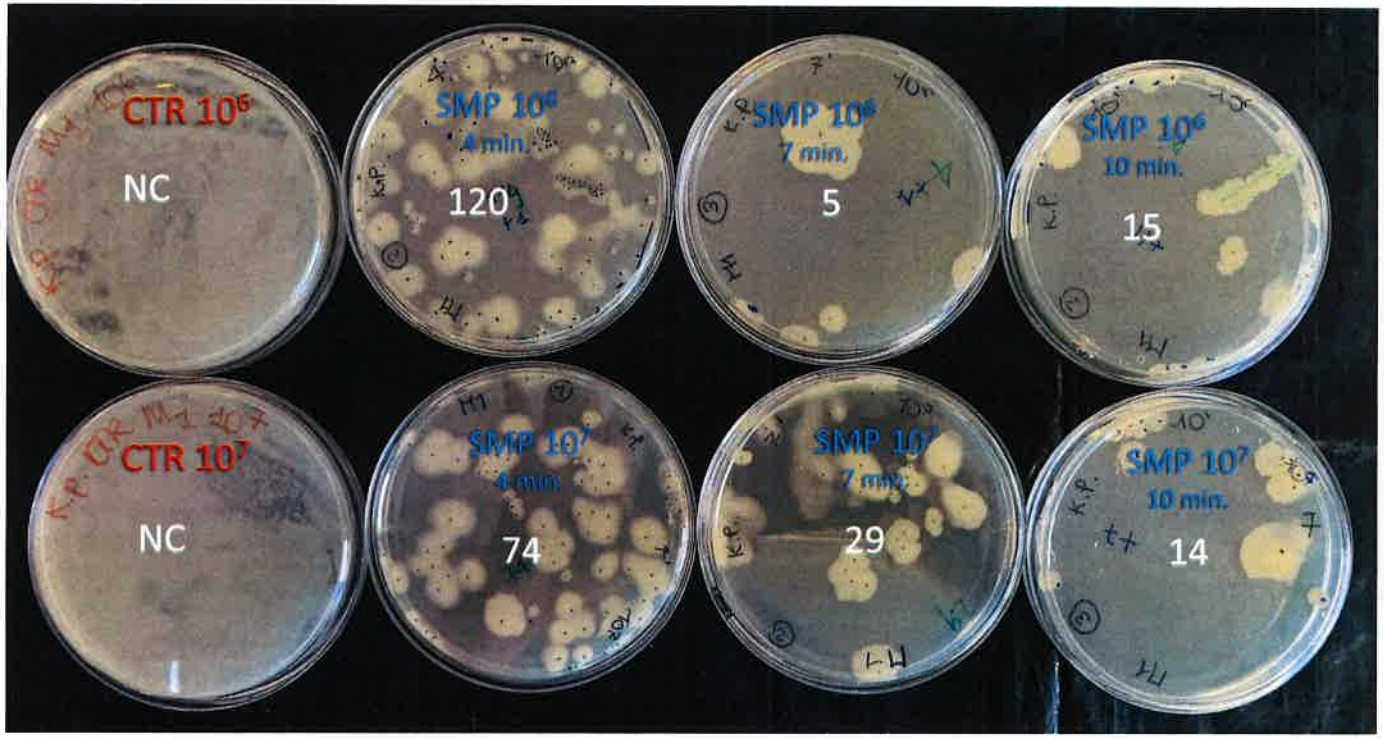
Times:
- 5, 8, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable



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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Klebsiella pneumoniae ATCC BAA-1705:
Second test

Concentrations:
- $1x10^7$ CFU/mL
- $1x10^6$ CFU/mL

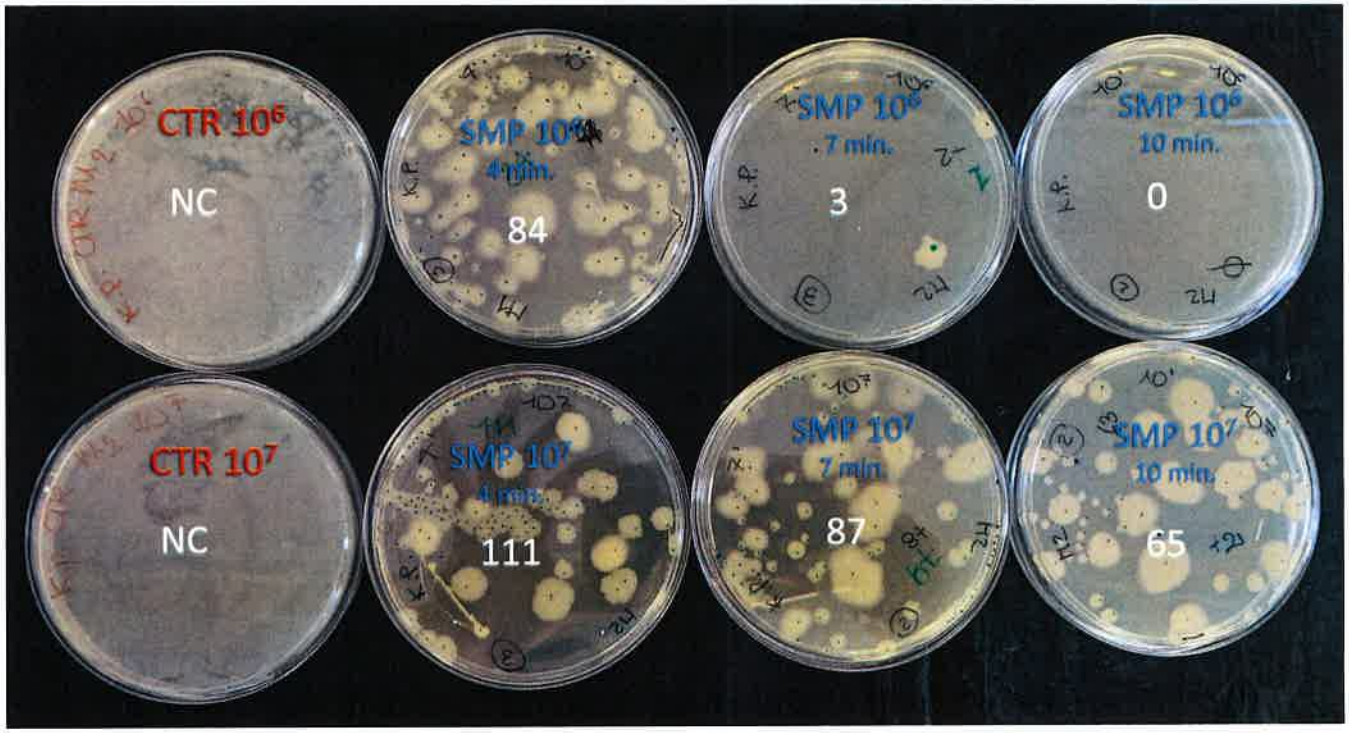
Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable



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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS

Klebsiella pneumoniae ATCC BAA-1705:
Third test

Concentrations:
- $1x10^7$ CFU/mL
- $1x10^6$ CFU/mL

Times:
- 4, 7, 10 minutes

Distance:
- 3.5 m (from light source)

Medium:
- PCA (Plate Count Agar)

Incubation:
- 36 °C for 48h

SMP: Sample
CTR: Positive Control
NC: Not Countable

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TEST ON UV PENTALIGHT AT 3.5m BY LIGHT PROGRESS