

Supplementary Table S1. Summary of antibiotic treatments administered to the patient

Date	Antibiotics	Dose	Route	Frequency
D-172 - D-164	Meropenem	1g	IV	q6h
D-141 - D-133	Fluconazole	0.2g	IV	qd
D-141 - D-129	Cefoperazone/Sulbactam	3g	IV	q8h
D-129 - D-118	Piperacillin/Tazobactam	4.5g	IV	q8h
D-117 - D-104	Ceftazidime/Avibactam	2.5g	IV	q8h
D-116 - D-104	Ciprofloxacin	2g	IV	qd
D-104 - D-91	Isepamicin	0.2g	IV	q12h
D-91 - D-79	Ceftazidime	2g	IV	q12h
D-66 - D-62	Piperacillin/Tazobactam	4.5g	IV	q8h
D-65 - D-62	Colistin	50mg	IV	q12h
D-61 - D-48	Isepamicin	0.2g	IV	q12h
D-45 - D-36	Meropenem	1g	IV	q6h
D-36 - D-27	Piperacillin/Tazobactam	4.5g	IV	q8h
D-32 - D-25	Minocycline	0.1g	IV	q12h
D-28 - D-20	Colistin	50mg	IV	q12h
D-14 - D-6	Ceftazidime/Avibactam	2.5g	IV	q8h
D-10 - D25	Fluconazole	0.2g	IV	qd
D-5 - D5	Colistin	50mg	IV	q12h
D3 - D5	Tigecycline	50mg	IV	q12h
D14 - D25	Ciprofloxacin	2g	IV	qd
D19 - D29	Isepamicin	0.2g	IV	q12h
D20 - D22	Minocycline	0.1g	IV	q12h
D30 - D34	Cefoperazone Sulbactam	3g	IV	q8h
D34 - D44	Ceftazidime Avibactam	2.5g	IV	q8h
D45 - D47	Levofloxacin	0.5g	IV	qd
D48 - D54	Ciprofloxacin	2g	IV	qd
D55 - D66	Piperacillin/Tazobactam	4.5g	IV	q8h

The antibiotic treatment started on August 30, 2022, and ended on May 10, 2023. The phage therapy began on February 18, 2023, which is designated as D0.

Supplementary Table S2. Susceptibility of *Pseudomonas aeruginosa* isolates to antibiotics

Strain	MIC (mg/L)									
	TCC	TZP	CAZ	SCF	FEP	IPM	MEM	TOB	LVX	CL
NPA09B	≥128	≥128	32	≥64	16	≥16	≥16	≤1	2	≤0.5
NPA10B	≥128	32	8	32	8	2	4	≤1	4	2
NPA11B	≥128	ND	8	≥64	8	≥16	≥16	≤1	≥8	≤0.5
NPA12B	≥128	32	8	≥64	16	2	4	≤1	4	1
NPA13B	≥128	≥128	16	≥64	16	≥16	≥16	≤1	≥8	≤0.5

TCC,

Ticarcillin/Clavulanic acid; TZP, Piperacillin/Tazobactam; CAZ, Ceftazidime; SCF, Cefoperazone/Sulbactam; FEP, Cefepime; IPM, Imipenem; MEM, Meropenem; TOB, Tobramycin; LEV, Levofloxacin; CL, Colistin; ND, not determined.

Supplementary Table S3. Changes in semi-quantitative culture scoring in patient's sputum

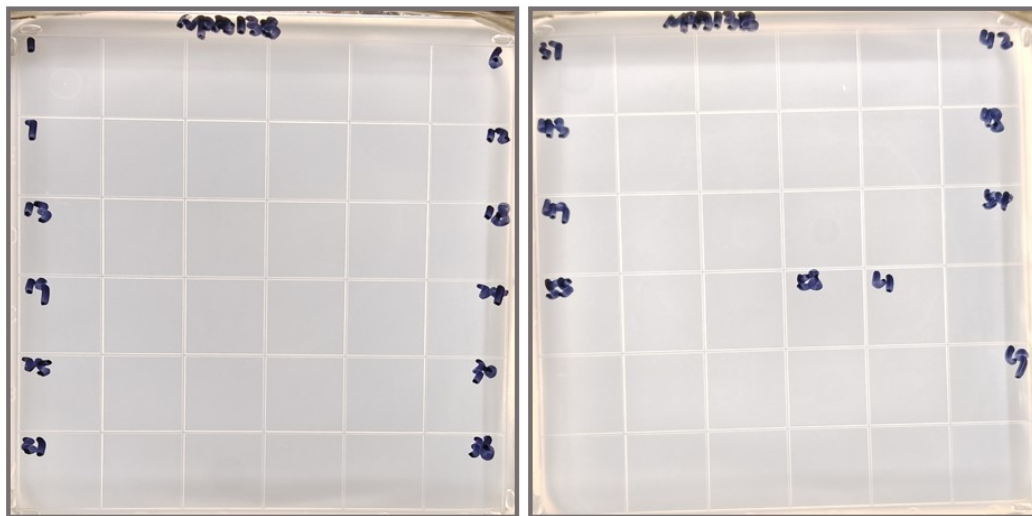
Time	Bacterial semi-quantitative count
D-10	+++
D20	++
D32	+
D43	+

"+++" indicates moderate growth, "++" indicates light growth, and "+" indicates rare growth.

Supplementary Table S4: Morphological parameters of phages: capsid diameter and tail length

Phage	Head diameter	Tail length
PaSz-1_45_92k	80 nm	102 nm
PaZh_1	102 nm	200 nm
PA_L9	80 nm	300 nm

Supplementary Table S5: Antibiotic resistance gene analysis of clinical isolates using CARD.



Supplementary Figure. S1. Susceptibility of *P. aeruginosa* NPA13B to a library of *P. aeruginosa* phages.

NPA13B was tested for sensitivity to 64 *P. aeruginosa* phages using the double-layer agar plate method. The results showed no visible plaques on the bacterial lawn of NPA13B.

A



B



Supplementary Figure. S2. *Galleria mellonella* infection assay

A: Healthy larvae are cream-colored, have noticeable tonus and are spontaneously mobile. B: At a certain time point after infection, all larvae die then complete melanization (black color).