

The Citizen Phage Library: rapid isolation of phages for the treatment of antibiotic resistant infections in the UK

Supplementary Material

Methods

Table S1. Antibiotic susceptibility profiles for *K. pneumoniae*, *E. cloacae* and *E. coli* strains (susceptibility information provided by the clinical microbiology laboratory).

	Carba-5-IMP Test	Carba-5-KPC Test	Carba-5-NDM Test	Carba-5-OXA-48-Test	Carba-5-VIM Test	Cefiderocol	Ceftazidime-Avibactam	Ceftolozane-Tazobactam	Chloramphenicol	Ciprofloxacin	Co-Trimoxazole	Gentamicin	Amikacin
<i>Klebsiella pneumoniae</i> (BPRG 1484)	Pos	Neg	Neg	Neg	Neg	S	R	R	S	R	R	S	S
<i>Enterobacter cloacae</i> (BPRG 1482)	Pos	Neg	Neg	Neg	Neg	S	R	R	S	S	R	R	S
<i>Escherichia coli</i> (BPRG 1486)	Pos	Neg	Neg	Neg	Neg	S	R	R	S	R	R	S	S

Axenic phage purification

For axenic phage purification two methods were used. For the first approach, phage suspensions in SM buffer were serially diluted (1:10) in sterile PBS in a microtitre plate and 5 µL of each dilution was spotted onto inoculated top agar overlays. Following overnight incubation at 37 °C, a well isolated plaque was picked from the highest dilution yielding plaques. The core was placed in 100 µL of SM buffer and the process was repeated a further two times. At the end of three rounds of purification, the phage suspension in SM buffer was considered to be axenic. For the second approach, the phage suspension was serially diluted (1:10) in sterile PBS in a microtitre plate as before. Each dilution was then spotted (5 µL) onto inoculated top agar and incubated overnight at 37 °C. The dilution plate was stored at 4 °C. The highest dilution giving plaques (2-10 individual plaques within the 5 µL spot) was then noted. Using the original microtitre dilution plate, 50-100 µL of the selected dilution was added to 3 mL of molten top agar along with 1 mL of mid-logarithmic

culture and poured over the surface of a 9 cm diameter bottom agar plate. After overnight incubation, well isolated plaques were usually obtained with good clearance around each plaque. A single well isolated plaque was selected and transferred to SM buffer. At this point the phage was considered axenic.

In vivo Galleria mellonella infection assay

The efficacy of *K. pneumoniae* phage cocktails was assessed using an *in vivo* *G. mellonella* model described by Champion *et al.* (40). The bacterial inoculum was prepared as follows. A mid-logarithmic culture of *K. pneumoniae* BPRG 1484 grown in sLB was centrifuged at 5,000 × *g* for 10 min and the resulting pellet resuspended in sterile saline to give an OD₆₀₀ of 1 ± 0.05. Viable counts were carried out on the bacterial suspension according to the method of Miles and Misra (57). A *K. pneumoniae* suspension with an OD₆₀₀ = 1 was expected to contain approximately 5 × 10⁸ CFU/mL. Phage seed lots were first checked for sterility by spotting a 5 µL drop of the preparation onto LB agar. Plates were checked for microbial growth following overnight incubation at 37 °C. PFU/mL counts were carried out to determine the titre of the phage seed lots as described previously. Dilutions of the phage seed lots were prepared in sterile saline as required. Research-grade *G. mellonella* larvae in their final-instar stage were obtained from the *Galleria mellonella* Research Centre (University of Exeter, UK). Larvae were stored in the dark at 15 °C and used within the week of arrival. Larvae were divided into treatment groups and any that were discoloured or appeared to be in poor health were discarded. A 250 µL Hamilton syringe (Merck, Darmstadt, Germany) was used for inoculations. The needle was prepared before and between treatments by washing twice in 70% ethanol and twice in 1× PBS. To check needle sterility before and after injections, PBS washes were spotted onto LB agar, placed at 37 °C and checked for microbial growth following overnight incubation. Separate needles were used for bacterial and phage inoculums. Larvae were injected with 10 µL of inoculum in the first left proleg. Where two injections were necessary, the second injection was delivered into the first right proleg after a 30 min rest period. Injected larvae were placed on filter paper in petri dishes and any larvae showing signs of injury or loss of haemolymph from the injection site were replaced. No-stab controls were observed alongside each experiment. Once injections were complete, the larvae were transferred to 3D printed plastic trays with wells to separate and contain individual larvae (Figure S1). Trays were covered with fitted lids and incubated at 37 °C.

Table S2. Treatment groups for the experiment to determine effect of phage cocktails on the melanisation of *K. pneumoniae* infected *G. mellonella* larvae (n = 10). Experiment carried out once only. The dose for the *K. pneumoniae* inoculum was 4.0×10^6 CFU in saline delivered in a 10 μ L volume. The dose for the phage cocktails was 2×10^7 PFU in saline delivered in a 10 μ L volume (with 1×10^7 PFU for each phage in the two-phage cocktails and 5×10^6 PFU for each phage in the four-phage cocktail). Larvae receiving no injections were kept in a separate petri-dish.

Treatment group (n = 10)	Injection 1 (10 μ L)	Injection 2 (10 μ L)
1 (uninfected)	saline	saline
2 (uninfected)	saline	cocktail 1 (CPL00362 and CPL00368)
3 (uninfected)	saline	cocktail 2 (CPL00369 and CPL00379)
4 (uninfected)	saline	cocktail 3 (CPL00362, CPL00368, CPL00369 and CPL00379)
5 (infected)	<i>K. pneumoniae</i> BPRG 1484	saline
6 (infected)	<i>K. pneumoniae</i> BPRG 1484	cocktail 1 (CPL00362 and CPL00368)
7 (infected)	<i>K. pneumoniae</i> BPRG 1484	cocktail 2 (CPL00369 and CPL00379)
8 (infected)	<i>K. pneumoniae</i> BPRG 1484	cocktail 3 (CPL00362, CPL00368, CPL00369 and CPL00379)

Table S3. Plate layouts for the 8 treatment groups for the experiment to determine effect of phage cocktails on the survival and melanisation of *K. pneumoniae* BPRG 1484 infected *G. mellonella* larvae (n = 10).

a) Plate 1 layout

J	1	1	1	1	1
I	5	5	5	5	5
H	6	6	6	6	6
G	7	7	7	7	7
F	8	8	8	8	8
E	1	1	1	1	1
D	5	5	5	5	5
C	6	6	6	6	6
B	7	7	7	7	7
A	8	8	8	8	8

b) Plate 2 layout

J					
I	3	3	3	3	3
H	4	4	4	4	4
G	5	5	5	5	5
F					
E					
D	3	3	3	3	3
C	4	4	4	4	4
B	5	5	5	5	5
A					

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Figure S1. 3D printed plastic trays with wells to separate and contain individual *G. mellonella* larvae. Plastic lids were securely fitted to the tray to prevent escape during the assay.

Results

Table S4a Characteristics of the 20 phages active against the *K. pneumoniae* BPRG 1484 strain and their citizen scientist given names.

Phage	Isolating host	Given name	● Novel species	ANI [‡] (%)	Closest known phage (accession number)	Family	Genus	Genome length (bp)	Accession number
			● Novel strain						
CPL00345	<i>K. pneumoniae</i> DFI 20.19	GlastoCabaret	●	91.7	Klebsiella phage vB_Kpn_B01 (MT380195)	Demereciviridae	Sugarlandvirus	110,382	OR896840
CPL00361	<i>K. pneumoniae</i> BPRG 1484	Identical to CPL00362		94.1	Klebsiella phage NL_ZS_3 (MT813142)	Autographiviridae	Teetrevirus	38,263	OR896841
CPL00362	<i>K. pneumoniae</i> BPRG 1484	Bobalons	●	94.1	Klebsiella phage NL_ZS_3 (MT813142)	Autographiviridae	Teetrevirus	38,265	OR896842
CPL00363	<i>K. pneumoniae</i> BPRG 1484		●	95.2	Klebsiella phage Sugarland (NC_042093)	Demereciviridae	Sugarlandvirus	110,303*	OR896843
CPL00364	<i>K. pneumoniae</i> BPRG 1484	PoeticCupcake	●	94.7	Klebsiella phage KPP-5 (MW600722)	Autographiviridae	Teetrevirus	38,959	OR896844
CPL00365	<i>K. pneumoniae</i> BPRG 1484	SmellyBerry	●	91.0	Klebsiella phage PhiKpNIH-10 (MN395285)	Drexlerviridae	Webervirus	49,698	OR896845
CPL00366	<i>K. pneumoniae</i> BPRG 1484	RareGolfball	●	86.0	Klebsiella phage KOX1 (NC_047825)	Drexlerviridae	Webervirus	50,866*	OR896846
CPL00367	<i>K. pneumoniae</i> BPRG 1484	HelplessSquare	●	92.4	Klebsiella phage cp25 (OX335410)	Drexlerviridae	Webervirus	50,894	OR896847
CPL00368	<i>K. pneumoniae</i> BPRG 1484	DevonBitter	●	93.6	Klebsiella phage Sugarland (NC_042093)	Demereciviridae	Sugarlandvirus	109,055*	OR896848
CPL00369	<i>K. pneumoniae</i> BPRG 1484		●	95.5	Klebsiella phage pK8 (OL702938)	Drexlerviridae	Webervirus	49,594*	OR896849
CPL00370	<i>K. pneumoniae</i> BPRG 1484	ViciousJeremy	●	94.5	Klebsiella phage KPP-5 (MW600722)	Autographiviridae	Teetrevirus	38,798	OR896850
CPL00371	<i>K. pneumoniae</i> BPRG 1484	MegaDucksbill	●	93.7	Klebsiella phage KPP-5 (MW600722)	Autographiviridae	Teetrevirus	38,471	OR896851
CPL00372	<i>K. pneumoniae</i> BPRG 1484	Bumbleweed	●	91.8	Klebsiella phage KPP-5 (MW600722)	Autographiviridae	Teetrevirus	38,833	OR896852
CPL00373	<i>K. pneumoniae</i> BPRG 1484		●	96.6	Klebsiella phage mtp25 (OX335391)	Drexlerviridae	Webervirus	48,297*	OR896853
CPL00374	<i>K. pneumoniae</i> BPRG 1484	Keithsmous	●	91.1	Klebsiella phage KPP-5 (MW600722)	Autographiviridae	Teetrevirus	39,057	OR896854
CPL00375	<i>K. pneumoniae</i> BPRG 1484	Keithstache	●	94.2	Klebsiella phage NL_ZS_3 (MT813142)	Autographiviridae	Teetrevirus	39,044	OR896855
CPL00376	<i>K. pneumoniae</i> BPRG 1484	SlimeyKevin	●	90.3	Klebsiella phage KpKT21phi1 (MK278861)	Drexlerviridae	Webervirus	49,643*	OR896856
CPL00377	<i>K. pneumoniae</i> BPRG 1484	MagicalPorter	●	84.9	Klebsiella phage B1 (MW672037)	Drexlerviridae	Webervirus	49,849	OR896857
CPL00378	<i>K. pneumoniae</i> BPRG 1484	AloofButler	●	90.4	Klebsiella phage cp25 (OX335410)	Drexlerviridae	Webervirus	51,584	OR896858
CPL00379	<i>K. pneumoniae</i> BPRG 1484	StarXobjector	●	88.7	Klebsiella phage mtp25 (OX335391)	Drexlerviridae	Webervirus	49,862*	OR896859

[‡] ANI – average nucleotide identity (%) to nearest neighbour, calculated using VIRIDIC

*denotes original contig length as redundant termini were not found with apc

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Table S4b. Characteristics of the 21 phages active against the *E. coli* BPRG 1486 strain and their citizen scientist given names.

Phage	Isolating host	Given name	Novel species	ANI* (%)	Closest known phage (accession number)	Family	Genus	Genome length (bp)	Accession number
			Novel strain						
CPL00121	<i>E. coli</i> BW25113		●	95.2	Escherichia phage tunus (NC_049816)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	51,258	OR896819
CPL00124	<i>E. coli</i> BW25113	Stokescottia	●	91.2	Salmonella phage L6jm (NC_048852)	<i>Demerecviridae</i>	<i>Tequintavirus</i>	109,873	OR896820
CPL00134L	<i>E. coli</i> BW25113	Phagiculus	●	47.0	Escherichia phage vB_EcoS_MM0 (MK373793)	<i>Drexlerviridae</i>	<i>Rogunavirinae</i> (subfamily)	46,458	OR896821
CPL00136	<i>E. coli</i> BW25113		●	96.5	Salmonella phage vB_SenS-3 (MT004791)	<i>Demerecviridae</i>	<i>Epseptomavirus</i>	111,837	OR896822
CPL00144L	<i>E. coli</i> BW25113	NorthRox	●	93.8	Escherichia phage vB_Eco_Sip (OU734268)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	51,138	OR896823
CPL00146S	<i>E. coli</i> BW25113	SmurfNell	●	91.0	Escherichia phage SuperGirl (MZ501105)	<i>Demerecviridae</i>	<i>Epseptomavirus</i>	111,148	OR896824
CPL00151	<i>E. coli</i> BW25113		●	96.8	Escherichia phage W115 (ON286974)	<i>Straboviridae</i>	<i>Krischvirus</i>	164,032	OR896825
CPL00152	<i>E. coli</i> BW25113	Aragogtheria	●	87.7	Salmonella phage ende (MT074454)	<i>Demerecviridae</i>	<i>Epseptomavirus</i>	111,070*	OR896826
CPL00159	<i>E. coli</i> BW25113	MikeNSara	●	94.5	Escherichia phage atuna (MN850620)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	50,759	OR896827
CPL00160	<i>E. coli</i> BW25113		●	97.0	Escherichia phage tuinn	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	51,375	OR896828
CPL00168	<i>E. coli</i> BW25113	MatMar	●	94.6	Escherichia phage Jahat_MG145 (MK552105)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	50,761	OR896829
CPL00169 (contained 2 phages)	<i>E. coli</i> BW25113	LinBro	●	91.6	Escherichia phage momo (MN850580)	<i>Ounavirinae</i> (subfamily)	<i>Felixounavirus</i>	85,930	OR896830
			●	97.5	Escherichia phage tunus (NC_049816)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	50,979	OR912983
CPL00172	<i>E. coli</i> BW25113	BubbaBully	●	76.5	Enterobacter phage N5822 (MW032452)	<i>Drexlerviridae</i>	<i>Henuseptomavirus</i>	51,300	OR896831
CPL00187	<i>E. coli</i> BW25113		●	96.5	Escherichia phage W115 (ON286974)	<i>Straboviridae</i>	<i>Krischvirus</i>	163,470	OR896832
CPL00188L	<i>E. coli</i> BW25113	WaterSpirit	●	92.5	Escherichia phage Jahat_MG145 (MK552105)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	51,324	OR896833
CPL00220	<i>E. coli</i> BW25113	Baret	●	92.8	Escherichia phage vB_Eco_mar004NP2 (LR027384)	<i>Demerecviridae</i>	<i>Tequintavirus</i>	108,072	OR896834
CPL00221	<i>E. coli</i> BW25113	RobRod40	●	69.3	Escherichia phage AugustePiccard (MZ501051)	<i>Drexlerviridae</i>	<i>Christensenvirus</i>	47,574	OR896835
CPL00224	<i>E. coli</i> BW25113	Identical to CPL00121		95.2	Escherichia phage tunus (NC_049816)	<i>Drexlerviridae</i>	<i>Warwickvirus</i>	51,258	OR896836
CPL00229	<i>E. coli</i> BW25113		●	95.0	Escherichia phage vB_Eco_mar004NP2 (LR027384)	<i>Demerecviridae</i>	<i>Tequintavirus</i>	98,746	OR896837
CPL00259L	<i>E. coli</i> BW25113	McMelon	●	89.9	Escherichia virus TH11 (MT446389)		<i>Dhillonvirus</i>	44,740	OR896838
CPL00262	<i>E. coli</i> BW25113		●	95.1	Salmonella phage S147	<i>Demerecviridae</i>	<i>Epseptomavirus</i>	38,265	OR896839

* ANI – average nucleotide identity (%) to nearest neighbour, calculated using VIRIDIC

*denotes original contig length as redundant termini were not found with apc

Table S5. Virulence Index (V_p) for each of the phages against the target strains *K. pneumoniae* BPRG 1484 and *E. coli* BPRG 1486. The closer the V_p is to one, the greater the virulence of the phage. Phages selected for the preparation of seed lots are highlighted.

Target strain	Phage	Virulence Index (V_p)
<i>K. pneumoniae</i> BPRG 1484	CPL00345	0.100826
<i>K. pneumoniae</i> BPRG 1484	CPL00361	0.689978
<i>K. pneumoniae</i> BPRG 1484	CPL00362	0.817532
<i>K. pneumoniae</i> BPRG 1484	CPL00363	0.982511
<i>K. pneumoniae</i> BPRG 1484	CPL00364	0.723433
<i>K. pneumoniae</i> BPRG 1484	CPL00365	0.590229
<i>K. pneumoniae</i> BPRG 1484	CPL00366	0.306778
<i>K. pneumoniae</i> BPRG 1484	CPL00367	0.323811
<i>K. pneumoniae</i> BPRG 1484	CPL00368	1.004923
<i>K. pneumoniae</i> BPRG 1484	CPL00369	0.992067
<i>K. pneumoniae</i> BPRG 1484	CPL00370	0.721374
<i>K. pneumoniae</i> BPRG 1484	CPL00371	0.736925
<i>K. pneumoniae</i> BPRG 1484	CPL00372	0.668646
<i>K. pneumoniae</i> BPRG 1484	CPL00373	0.634391
<i>K. pneumoniae</i> BPRG 1484	CPL00374	0.662472
<i>K. pneumoniae</i> BPRG 1484	CPL00375	0.79346
<i>K. pneumoniae</i> BPRG 1484	CPL00376	0.863438
<i>K. pneumoniae</i> BPRG 1484	CPL00377	0.248178
<i>K. pneumoniae</i> BPRG 1484	CPL00378	0.257166
<i>K. pneumoniae</i> BPRG 1484	CPL00379	0.912943
<i>K. pneumoniae</i> BPRG 1484	No phage	0

Target strain	Phage	Virulence Index (V_p)
<i>E. coli</i> BPRG 1486	CPL00121	0.891691
<i>E. coli</i> BPRG 1486	CPL00124	0.222727
<i>E. coli</i> BPRG 1486	CPL00134L	-0.069
<i>E. coli</i> BPRG 1486	CPL00136	0.257928
<i>E. coli</i> BPRG 1486	CPL00144L	0.32647
<i>E. coli</i> BPRG 1486	CPL00146S	0.99137
<i>E. coli</i> BPRG 1486	CPL00151	1.044243
<i>E. coli</i> BPRG 1486	CPL00152	0.531361
<i>E. coli</i> BPRG 1486	CPL00159	0.96467
<i>E. coli</i> BPRG 1486	CPL00160	0.355708
<i>E. coli</i> BPRG 1486	CPL00168	1.044042
<i>E. coli</i> BPRG 1486	CPL00169L	0.935219
<i>E. coli</i> BPRG 1486	CPL00172	0.969007
<i>E. coli</i> BPRG 1486	CPL00187	1.012859
<i>E. coli</i> BPRG 1486	CPL00188L	1.05294
<i>E. coli</i> BPRG 1486	CPL00220	0.950268
<i>E. coli</i> BPRG 1486	CPL00221	-0.09499
<i>E. coli</i> BPRG 1486	CPL00224	1.031495
<i>E. coli</i> BPRG 1486	CPL00229	0.364842
<i>E. coli</i> BPRG 1486	CPL00259L	0.606492
<i>E. coli</i> BPRG 1486	CPL00262	0.585566
<i>E. coli</i> BPRG 1486	T7	1.009949
<i>E. coli</i> BPRG 1486	No phage	0

Table S6. Titre (PFU/mL) of phage lysates at each stage of the preparation of the four *K. pneumoniae* seed lots.

Phage	Mini phage lysate	Midi phage lysate	Maxi phage lysate	Precipitated phage suspension (in 20 mL saline)	CsCl phage band before dialysis	Phage band after dialysis (final seed lots)
CPL00362	10 ¹⁰	1.2 x 10 ⁹	TNTC	TNTC	TNTC	2.0 x 10 ¹¹
CPL00368	1.2 x 10 ⁹	2.4 x 10 ¹¹	5.0 x 10 ¹²	2.8 x 10 ¹⁴	3.8 x 10 ¹⁶	2.0 x 10 ¹⁰
CPL00369	2.6 x 10 ¹⁰	2.7 x 10 ¹⁴	2.5 x 10 ⁹	Not recorded	4.9 x 10 ¹⁵	5.2 x 10 ¹¹
CPL00379	4.9 x 10 ¹³	1.2 x 10 ⁸	TNTC	3.8 x 10 ¹¹	4.3 x 10 ¹⁷	4.0 x 10 ¹¹

Too numerous to count (TNTC)

Table S7. Purity of the four *K. pneumoniae* phage seed lots as determined by short-read DNA sequencing.

Phage	Number of reads	Coverage of phage genome (x-fold)	% host reads	% unmapped reads	Evidence of prophage
CPL00362	2,895,997	10,868	1.13	0.14	No
CPL00368	2,508,024	3,341	0.12	0.18	No
CPL00369	4,407,409	10,946	15.92	0.16	No
CPL00379	2,677,102	5,799	25.3	0.61	No

Galleria mellonella infection assays

The first stage in the *G. mellonella* infection model experiments was to establish the dose of *K. pneumoniae* required to induce a measurable effect on melanisation and survival of the larvae so that any rescue effect of the phage cocktails could be observed and these results are presented in Figures S2 and S3. Challenging *G. mellonella* larvae with *K. pneumoniae* at the highest dose tested of 4.6×10^6 CFU induced melanisation of the larvae and caused larval death. After 8 h, melanisation was significantly greater in larvae receiving the highest dose (Figure S2) and after 24 h, 60% of these larvae had died (Figure S3). No melanisation occurred in the larvae receiving PBS in place of *K. pneumoniae* and all larvae in this treatment group survived the duration of the experiment (24 h post-infection).

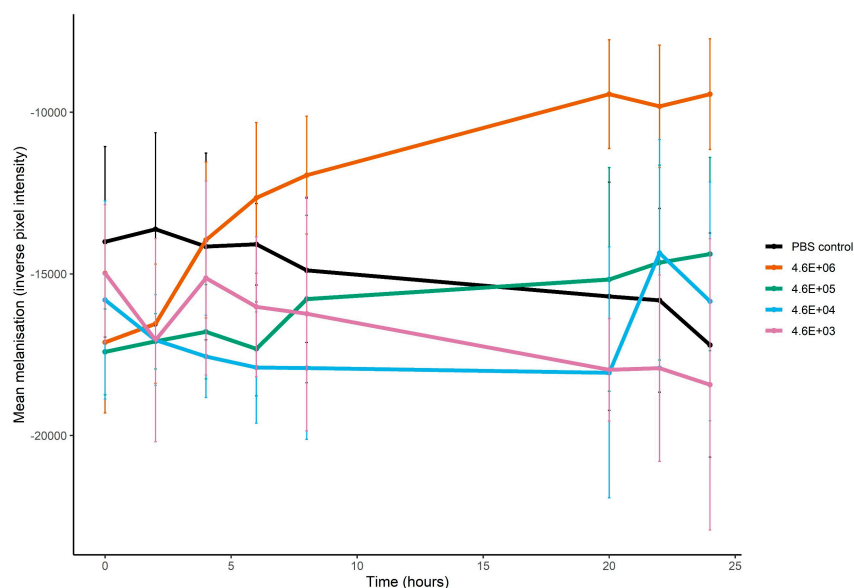


Figure S2. Effect of *K. pneumoniae* dose (CFU/mL) on melanisation of *G. mellonella* larvae. *K. pneumoniae* dose was administered in 10 μ L, control larvae received 10 μ L of sterile PBS.

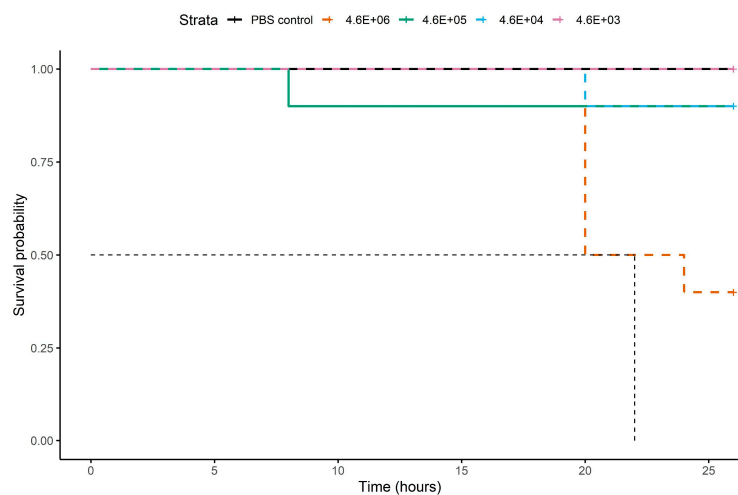


Figure S3. Effect of *K. pneumoniae* dose (CFU/mL) on survival of *G. mellonella* larvae. *K. pneumoniae* dose was administered in 10 μ L, control larvae received 10 μ L of sterile PBS.

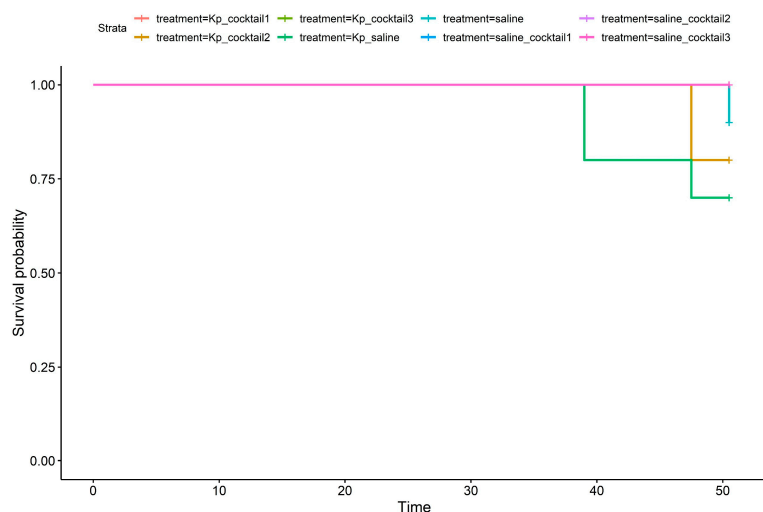


Figure S4. Effect of phage cocktails on survival of *K. pneumoniae* infected *G. mellonella* larvae. Each larvae received 2 injections: 10 μ L of *K. pneumoniae* bacterial cells or 10 μ L of saline and 10 μ L of phage cocktail or 10 μ L saline. *K. pneumoniae* dose = 4.0×10^6 CFU delivered in a 10 μ L volume. Phage cocktail dose = 2×10^7 PFU in saline delivered in a 10 μ L volume (with 1×10^7 PFU for each phage in the two-phage cocktails and 5×10^6 PFU for each phage in the four-phage cocktail).

Table S8. Full linear model showing the effect of treatment (saline, phage cocktail 1, phage cocktail 2, phage cocktail 3) and time on the melanisation of *K. pneumoniae* infected larvae (n = 10 per treatment group). *K. pneumoniae* infected larvae treated with saline was set as the reference group. Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.'

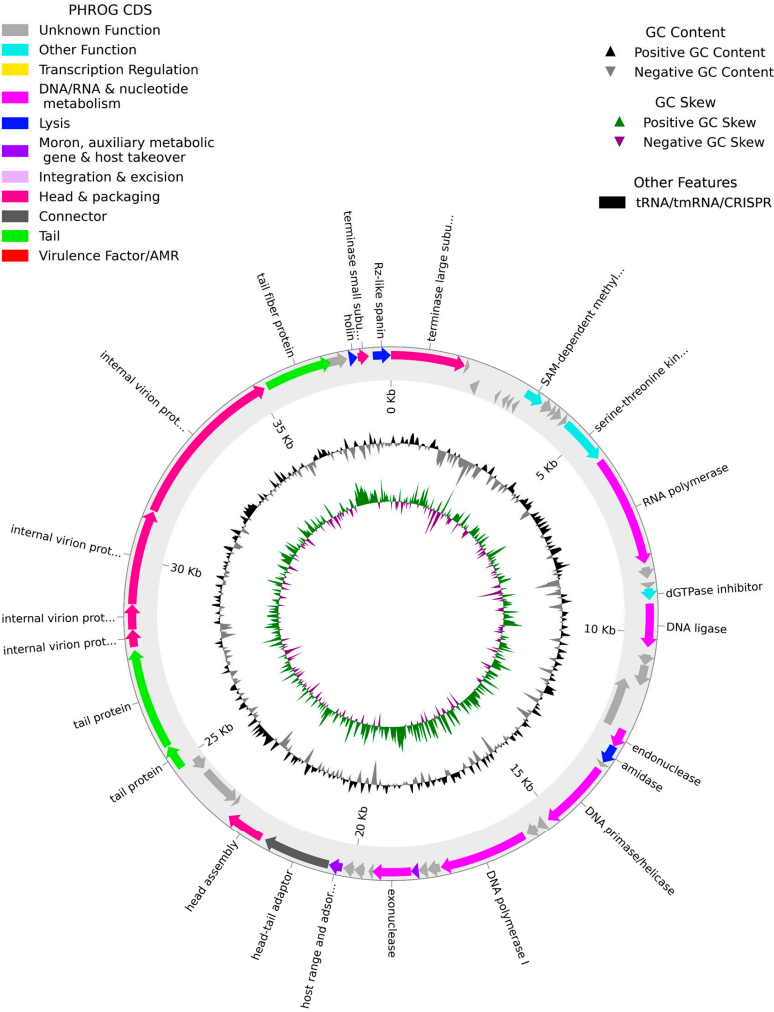
Variable	Estimate	Standard error	t value	p value
Intercept	-17121.2	1013.4	-16.9	<0.001***
Infected larvae + saline	491.3	1433.1	0.34	0.73
Infected larvae + cocktail 1	536.3	1433.1	0.37	0.70
Infected larvae + cocktail 2	119.6	1433.1	0.08	0.93
Infected larvae + cocktail 3	1382.9	1433.1	0.97	0.33
Time 14hrs	4571.1	1433.1	3.19	0.002**
Time 17hrs	4964.6	1433.1	3.46	<0.001***
Time 19hrs	5548.5	1433.1	3.87	<0.001***
Time 21hrs	5961.1	1433.1	4.16	<0.001***
Time 24hrs	6744.6	1433.1	4.71	<0.001***
Interactions treatment:time				
Infected larvae + saline:14hrs	-6340.1	2026.7	-3.13	0.002**
Infected larvae + cocktail 1:14hrs	-1988.2	2026.7	-0.98	0.33
Infected larvae + cocktail 2:14hrs	-2075.6	2026.7	-1.02	0.31
Infected larvae + cocktail 3:14hrs	-4751.4	2026.7	-2.34	0.02*
Infected larvae + saline:17hrs	-5.945.0	2026.7	-2.93	0.004**
Infected larvae + cocktail 1:17hrs	-2697.5	2026.7	-1.33	0.18
Infected larvae + cocktail 2:17hrs	-2409.0	2026.7	-1.19	0.24
Infected larvae + cocktail 3:17hrs	-2931.3	2026.7	-1.45	0.15
Infected larvae + saline:19hrs	-7687.1	2026.7	-3.80	<0.001***
Infected larvae + cocktail 1:19hrs	-2789.1	2026.7	-1.38	0.17
Infected larvae + cocktail 2:19hrs	-1765.4	2026.7	-0.87	0.38
Infected larvae + cocktail 3:19hrs	-4726.5	2026.7	-2.33	0.02*
Infected larvae + saline:21hrs	-6031.6	2026.7	-2.98	0.003**
Infected larvae + cocktail 1:21hrs	-2342.5	2026.7	-1.16	0.24
Infected larvae + cocktail 2:21hrs	-2007.2	2026.7	-0.99	0.32
Infected larvae + cocktail 3:21hrs	-3814.9	2026.7	-1.88	0.06
Infected larvae + saline:24hrs	-7368.7	2026.7	-3.64	<0.001***
Infected larvae + cocktail 1:24hrs	-2829.4	2026.7	-1.40	0.16
Infected larvae + cocktail 2:24hrs	-3363.4	2026.7	-1.66	0.09
Infected larvae + cocktail 3:24hrs	-5563.6	2026.7	-2.75	0.006**

Commented [M5]: Revised numeration, please confirm.

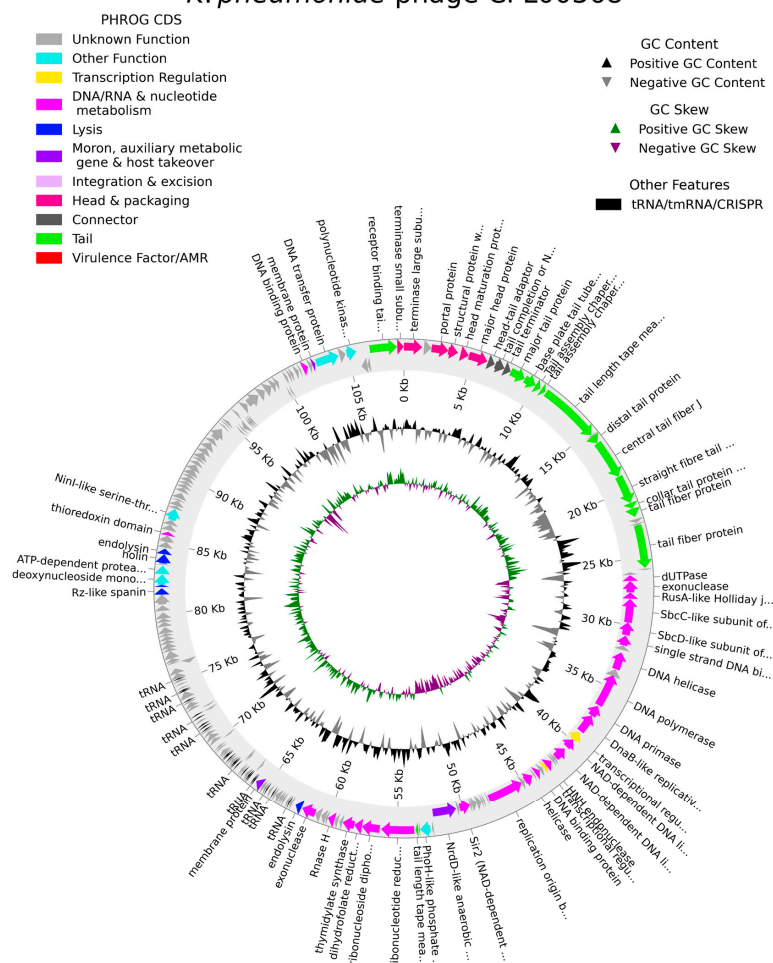
Commented [JF6R5]: Accepted, thank you.

(a) CPL00362

K. pneumoniae phage CPL00362



K. pneumoniae phage CPL00368



(c) CPL00369



