SUPPLEMENTARY INFORMATION

Elemental mapping using energy-dispersive X-ray spectroscopy

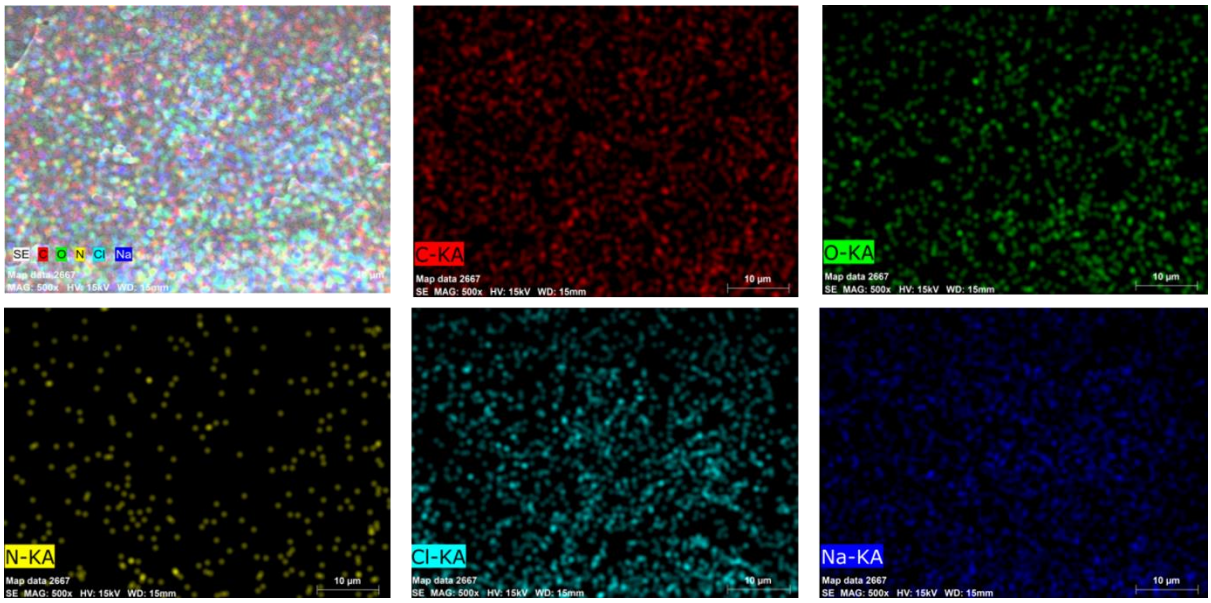

Fig. S1. FESEM micrographs displaying elemental mapping of rGO-DP1 nano conjugate.

Table S1. Weight percentage (%) of elements present in DP1, rGO and rGO-DP1.

Elements	DP1	rGO	rGO-DP1
	Elemental weight percentage (%)		
Carbon	64.69	82.72	57.36
Oxygen	24.30	17.28	19.46
Chlorine	0.61	-	2.27
Sodium	1.04	-	5.88
Nitrogen	9.36	-	15.02

High-resolution transmission electron microscopy

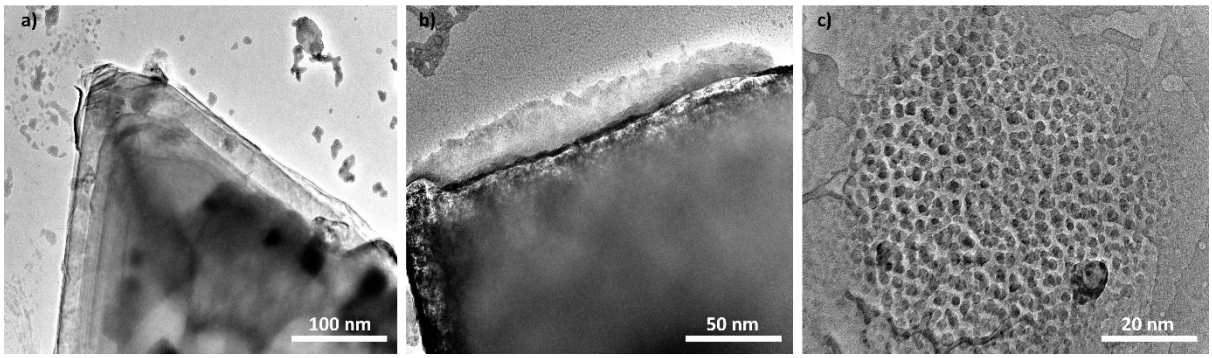

Fig. S2. HR-TEM micrographs rGO (a) and rGO-DP1 nano conjugate (b,c) at different magnifications.

Evaluation of *P. aeruginosa* growth

In order to conduct *in vivo* studies of the designed wound dressing it was important to quantify growth of the organism by conducting absorbance based measurements. Fig. S3 displays the growth curve graph of *P*. *aeruginosa*. It was observed that during the first three hours post inoculation, the opportunistic pathogen experienced lag phase. During this phase of growth, the bacteria adapted itself to the surrounding medium and growth conditions. Change in size without multiplication of cells along with production of enzymes and ribonucleic acid are the characteristics of a bacterium in lag phase. Post four hours of inoculation the bacterial growth entered exponential phase during which growth of bacterium present in the medium started to increase at a constant rate thereby enhancing population of *P*. *aeruginosa* in the media. After 6 hours post inoculation, the medium became turbid suggesting that the *P*. *aeruginosa* started forming thick biofilm associated colonies. It was observed that the stationary phase of *P*. *aeruginosa* growth was probably reached after 10 hours of incubation as no change in optical density (OD) was observed. Therefore, for the course of this study, *P*. *aeruginosa present in* exponential log phase (OD = 0.6 at 600 nm, obtained approximately after 5 hours of incubation at 37 °C) was used to initiate bacterial infection.

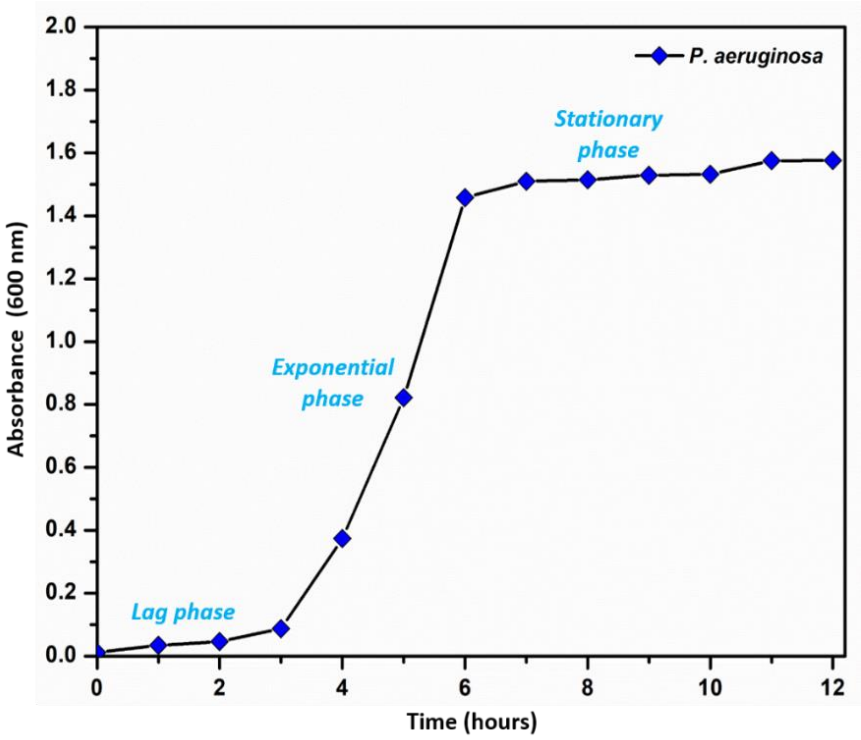

Fig. S3. Graph displaying characteristic growth curve of *P. aeruginosa* incubated in Luria-Bertani medium with respect to time (up to 12 hours at ± 37°C).

Evaluation of change in body weight

In order to determine the effect of the synthesized wound dressings on *P. aeruginosa* infected wound, change in body weight was monitored throughout the treatment period. Comparative graphical data displaying change in body weight (grams) of mice over a period of 8 days where the weight was observed on alternative days has been displayed in Fig. S4. Assessment of changes in body weight pattern of mice infected with bacteria particularly during excision wound models is crucial in order to access the health of the mice because decrease in weight is one of the first signs reflecting the progression of an infection [50]. It was observed that that in the control group in which excision wound was induced in mice but no infection showed decrease in weight on the second day followed by a stable weight gain. Whereas, *P. aeruginosa* infected group which was not given any wound dressing treatment showed a maximal weight loss on the eighth day. In the experimental group treated with rGO alone coated wound dressing, loss in weight was observed on the second day followed by steady weight. It was observed that rGO coated group showed steady yet slow recovery. In the alone DP1 coated wound dressing group weight loss (on day 2) followed by weight gain on day 4 was observed.

In comparison to all the experimental groups, highest weight gain was observed in the antibiotic coated wound dressing group.

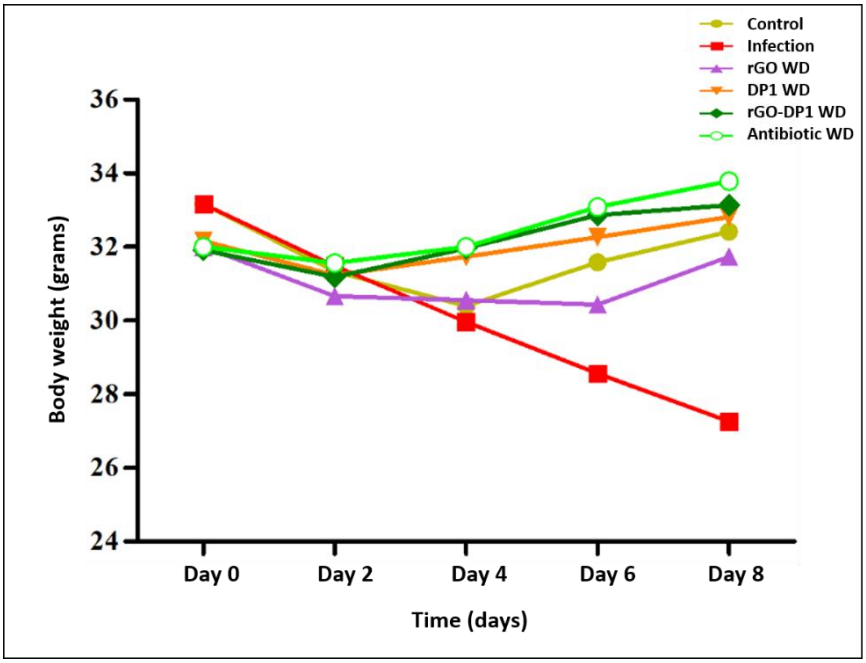

Fig. S4. Change in weight of mice infected with *P. aeruginosa* in wound excision model. Weight changes of mice (n=6 per experimental group) infected with 5 X 10^8 CFU/mL *P. aeruginosa* and their respective treatment groups were measured on alternate days for a period of 8 days.

On the second day after wound infection, all the wound dressing groups displayed maximum weight loss which may signify the onset of infection and thereby signifying body's coping mechanism. On day 4 post inoculation, significant weight gain was observed in DP1, rGO-DP1 and antibiotic loaded wound dressing groups. This increase in body weight is the first positive reflecting recovery (Cigana et al., 2020). The weight gain may be a consequence of variations in the diversity of gut microbiota which usually materializes upon consumption of antibiotics (Vallianou et al., 2021). Also, incorporation of low dose antibiotics in mice causes activation of additional genes that translate carbohydrates to short-chain fatty acids, causing lipid conversion in the liver thereby increasing fat build-up (Cho et al., 2012). The constant decrease in the body weight of *P. aeruginosa* infected mice may be attributed to progression of infection in organs such as lungs and may be applied as a prediction parameter for imminent mortality [51]. Trammell and Toth conducted a study during which parameters such as were identified to forecast a mortality in mice after inducting bacterial infection in mice models (Trammell & Toth, 2011).