of mice (n = 3) with and without local phosphate repletion after 30% hepatectomy and then retrieved from the distal intestinal tract 24 hours later. Because intestinal phosphate concentrations may differ between the luminal filtrate and mucus layer under conditions of operative stress, \textit{P. aeruginosa} was retrieved from each “compartment” and analyzed separately. Collected bacterial RNA was used to determine relative in vivo expression of PstS, a phosphate scavenging protein by standard real-time reverse transcription polymerase chain reaction (RT-PCR) techniques.\(^5\)

**Statistical analysis.** All statistical analysis of the data was performed using the Student \(t\) test and analysis of variance (ANOVA) with Microsoft Excel and Sigma Plot software. Kaplan-Meier Survival analysis was performed using SPSS 15.0 software (Chicago, Ill).

**RESULTS**

Phosphate depletion results in increased PA-1 lectin expression, pyocyanin production, biofilm formation, and PstS expression in vitro (Fig 1). Results demonstrate that phosphate depletion increased the virulence of \textit{P. aeruginosa} as judged by increase in PA-1 lectin, pyocyanin production, biofilm formation, and PstS expression.

Within the intestinal mucus layer, 30% hepatectomy in mice results in depleted phosphate concentration (Fig 2). Results demonstrate the relationship between the phosphate content present in serum, the intestinal mucus layer, and the intestinal luminal filtrate under increasing degrees of catabolic stress. Whereas phosphate content was progressively depleted in the intestinal mucus layer with increasing stress, there was no appreciable change in the luminal filtrate phosphate concentration.

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**Fig 3.** (A) PA-1 lectin is required for \textit{P. aeruginosa} to cause lethal gut-derived sepsis. A 48-hour Kaplan-Meier survival analysis of groups of mice (n = 10) after 30% operative hepatectomy and intestinal inoculation with either wild-type \textit{P. aeruginosa} (Hep + Pa) or its complimentary PA-1 lectin mutant, \(\Delta\text{lecA}\) (Hep + Pa \(\Delta\text{lecA}\); \(P = .005\)). (B) Effect of oral versus systemic (IV) phosphate (Pi) repletion on mortality in gut-derived sepsis owing to \textit{P. aeruginosa}. A 48-hour Kaplan-Meier survival analysis of groups of mice (n = 10) after 30% hepatectomy and intestinal inoculation with \textit{P. aeruginosa} (Hep/Pa); 30% hepatectomy in mice given oral Pi repletion along with intestinal inoculation of \textit{P. aeruginosa} suspended in Pi (Hep/Pa + oral Pi); 30% hepatectomy and intestinal inoculation of \textit{P. aeruginosa} suspended in Pi only (Hep/Pa + local Pi); 30% hepatectomy in mice given IV Pi and intestinal inoculation of \textit{P. aeruginosa} (Hep/Pa + IV Pi). \(P = .025\) Hep/Pa plus oral Pi versus Hep/Pa. (C) Effect of oral and systemic (IV) phosphate repletion on the intestinal mucus layer of mice. Groups of mice (n = 5) underwent 30% hepatectomy and intestinal inoculation of \textit{P. aeruginosa} alone (Hep/P.a), 30% hepatectomy in mice given IV Pi and intestinal inoculation of \textit{P. aeruginosa} (Hep/P.a + IV Pi), or 30% hepatectomy in mice given oral Pi repletion plus intestinal inoculation of \textit{P. aeruginosa} suspended in Pi (Hep/P.a + oral Pi). \(^*\)\(P < .001\). Results are presented as mean values ± SD for all groups.