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**Title:** In vivo macrophage phagocytosis of inhaled black carbon air pollution in COPD

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**Body:** Background Since airway macrophage (AM) phagocytosis of bacteria is impaired in patients with chronic obstructive pulmonary disease (COPD) (Donnelly LE et al., Eur Respir J 2010; 35: 1039–1047), we sought evidence for impaired uptake of traffic-derived black carbon (BC) in AM in COPD. Methods AM were obtained from patients with COPD (n=29) by sputum induction with hypertonic saline after informed consent. The mean area ( $\mu\text{m}^2$ ) of BC was assessed in 50 AM per patient using image analysis. Spirometry was performed, and COPD was classified according to GOLD criteria. AM BC load was compared between patient's GOLD stages by Mann Whitney test, and correlation between % predicted FEV1 and AM BC was tested by Spearman rank correlation. Results Compared with COPD GOLD stage 1 (n=9), patients with GOLD stage 3 (n=5) had reduced AM BC ( $p<0.05$ , [Figure 1]). Percent predicted FEV1 and AM- BC were positively correlated ( $R_s 0.38$ ,  $p<0.05$ , [Figure 2]). Conclusion In vivo phagocytosis of inhaled black carbon by AM is impaired in severe COPD. This may contribute to the vulnerability of patients with COPD to particulate matter air pollution.