Figure 1: Protein turnover signaling and myogenesis during acute loss and recovery of muscle mass. An overview of cellular signaling responsible for regulation of protein turnover and myogenesis as measured during acute atrophy (top figure) and recovery of muscle mass (bottom) in response to pulmonary inflammation induced by LPS (L) in control and elastase (E)-induced emphysematous mice. Targets measured as mRNA expression are indicated by italics. Targets measured as protein expression are displayed in bold. All markers and indicated phosphorylation sites shown here were measured in this thesis (except eIF4E). During regeneration, markers of protein synthesis were increased beyond baseline in E+L mice compared to L, potentially indicating a compensatory mechanism as a result of insufficient muscle mass recovery. Levels of Myostatin were higher in E+L compared to LPS, and fusion capacity was decreased in E+L compared to L, both indicating impaired myogenesis in E+L mice.
Figure 2: Expression of markers implicated in muscle mass regulation in differentiated myotubes incubated with COPD patient serum in presence or absence of TNF. Myoblasts from a human cell line were differentiated into myotubes and incubated with 2.5% human serum for 6 hours. To create a pro-inflammatory environment in order to mimic exacerbation, myotubes were also simultaneously incubated with TNF (2 ng/ml). Cells were harvested and mRNA levels of (A) IκBα, (B) MuRF1, (C) Atrogin-1 and (D) BNIP3 were determined. Controls (C) n=14, COPD n=48.

* p < 0.05, ** p < 0.01, *** p < 0.001, compared to their respective control. # represent a trend (0.05 < p < 0.1). An interaction between serum source and TNFα was detected for IκBα (p<0.001) and MuRF1 (p<0.001), indicating an increased response to TNF of myotubes cultured in serum of COPD patients.