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## Poster Abstracts

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### IMPACT OF SURFACTANT DEPLETION & SHORT TIME LIQUID VENTILATION ON INTRA-ALVEOLAR &-CELLULAR SURFACTANT: AN ELECTRONMICROSCOPICAL EVALUATION

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**Background:** The bronchoalveolar lavage (BAL) procedure is widely used in animal models to induce surfactant depletion and to study appropriate therapeutic interventions. However, little is known, how BAL affects the intra-alveolar or -cellular content and the morphological composition of the pulmonary surfactant.

Partial liquid ventilation (PLV) with perfluorocarbons (PFC) has been used to improve oxygenation in surfactant depleted animals. Data on the impact of PLV on surfactant metabolism are controversial.

**Objective:** To quantify morphological changes (light & electronmicroscopical level) of surfactant that are caused by BAL and short term PLV with a stereological approach.

**Methods:** Adult, male wistar rats were lavaged and either conventionally ventilated (*Lavage-Air*, n=5) or treated with PLV (*Lavage-PFC*, n=5) for 1 hour. For control, healthy animals with air (*Healthy-Air*, n=5) or PFC filled lungs (*Healthy-PFC*, n=5) were studied. PLV was performed with 30 ml/kg of PF 5080 from 3M. To quantify changes of lung parenchyma, intracellular and -alveolar surfactant pool at light and electron microscopic level a design-based stereological approach was used.

**Results:** Compared to *Healthy*-lungs, *Lavage*-animals had more type II cells with lamellar bodies in the process of secretion and freshly secreted lamellar-body-like surfactant in the alveoli. Fraction of surfactant covered alveolar epithelial surface area and total intraalveolar surfactant content were significantly smaller in *Lavage*-animals (table). Compared with *Air*-filled lungs, *PFC*-groups had a significantly higher total lung volume, but no other differences.

	<b>Healthy</b>		<b>Lavage</b>	
	<i>Air</i>	<i>PFC</i>	<i>Air</i>	<i>PFC</i>
<b>Alveolarepithel covered with surfactant [%]</b>	21,9±1,8	19,9±2,2	8,0±0,9	8,6±1,0
<b>Volume of i.a. surfactant per lung [mm<sup>3</sup>]</b>	21,1±4,5	19,3±1,6	10,0±1,1	13,3±2,3
<b>Density of surfactant per parenchyma [106mm<sup>3</sup>]</b>	4,4±0,7	5,0±0,7	2,9±0,2	2,6±0,3

**Conclusions:** The present study quantifies – for the first time – morphological changes in the pulmonary surfactant in a widely used animal model of surfactant depletion. In contrast to data published in the literature, short time PLV in surfactant depleted animals neither affects the intracellular and -alveolar surfactant composition nor the surfactant content.