ESRF	**Experiment title:** MRT vs BB: Evaluating acute damage in murine lung, a preliminary study for the treatment of pulmonary malignancies.	**Experiment number:** **MD-1181**
Beamline: ID17	**Date of experiment:** from:8.11.2018 to:10.12.2018	**Date of report:** 28.02.20
Shifts: 6	**Local contact(s):** Herwig Requardt	*Received at ESRF:*

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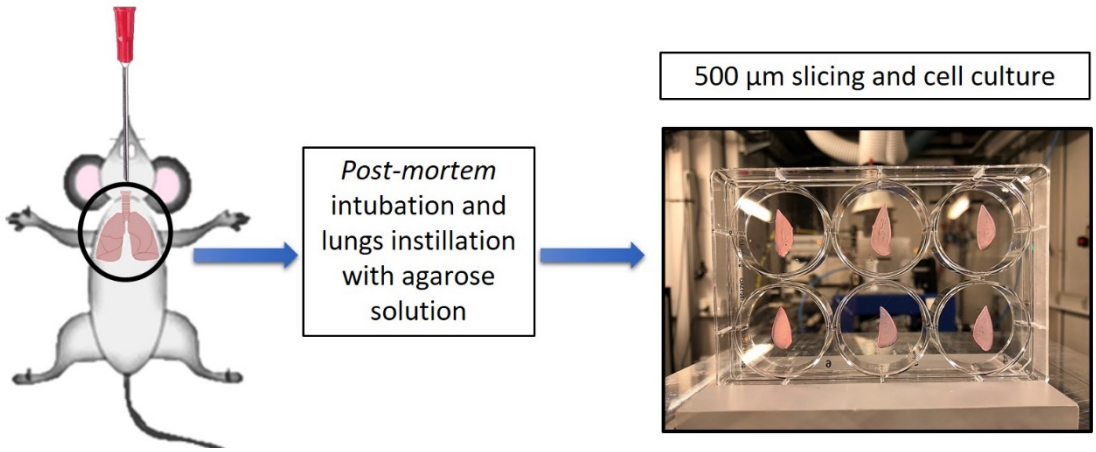
Report:

The aim of this project is to elucidate the early cellular and molecular mechanisms responsible for comprehensive tissue repair and minor degree lung fibrosis after Synchrotron MRT.

Material and Methods

We established an *ex-vivo* mouse model of lung tissue slices (Fig.1). Synchrotron MRT was applied (50 µm wide beams; 400 µm center to center) at the ID17 of the ESRF. Peak-doses of 100, 200, 400 and 800 Gy were delivered. Immunostaining and confocal microscopy were performed at different time points: 1h, 4h, 12h, 24h and 48h pi.

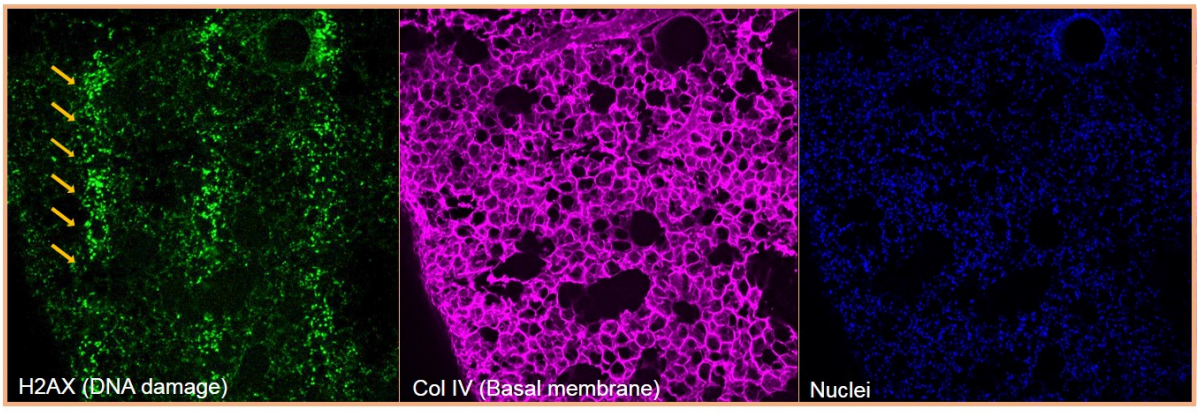
Fig.1 ***Ex-vivo*** **lung tissue slices model**



Results

The γH2A.X staining revealed persistent robust DNA damage in the cellular compartments exclusively within the beam paths after all doses up to 24h pi. Staining for type IV collagen does not reveal any structural damage to the basement membrane and ECM at all time points (Fig.2). Macrophages (negative for γH2A.X) were observed along the beam paths, suggesting that they migrated from the “valley” to the “peak” region.

Fig.2 **MRT does not elicits major structural damage in lung tissue**



Moreover, a first succesfull MRT trial was done on human lung tissue slices. Future work will involve confirming in the human model the results obtained in the mouse lung tissue slices.