Video-endoscopy of the lungs is a common diagnostic and therapeutic procedure in humans. Scientists at Charité – Universitätsmedizin Berlin now developed a miniature bronchoscope, which enables for examination and treatment of small animals. This represents a decisive step forward in experimental lung research – in the future it will be possible to obtain much more accurate and meaningful results. The initial applications of this method have been published in the American Journal of Respiratory Cell and Molecular Biology.*

Lung diseases are among the most frequent diseases occurring in humans, a fact that is reflected in the large number of research activities being conducted in the field of pneumology. Animal experiments are essential in the search for new therapeutic approaches. Because these often involve multiple examinations of the airways and lungs, an interdisciplinary team of scientists working with Prof. Martin Witzenrath, Department of Infectious Diseases and Respiratory Medicine, and Prof. Andreas Meisel, Department of Neurology, NeuroCure Clinical Research Center, have now developed a bronchoscope in miniaturized form. It is the smallest device currently available and was produced in cooperation with experts from a specialized manufacturer.

One challenge facing lung research in mice is the small size of their respiratory systems. Using this new technology, Berlin scientists are now developing minimally invasive applications for this field of research. Precisely targeted examinations or targeted treatments of certain regions of the lungs are now possible in very restricted spaces. “The procedure opens up new perspectives in research, in addition to improved control methods. For the first time it is now possible to separately treat and monitor specific lobes of the lungs”, says Prof. Witzenrath. In this way it is possible to carry out comparative studies or follow-up examinations in a single animal. This renders the results of experimental lung research more representative and more accurate.

In the future, the images and data provided by the fiber optic miniature bronchoscope will contribute to a better understanding of the disease mechanisms in people with lung disease. At the same time, this new method will serve to reduce the number of experimental animals in line with the existing international principles. The Charité – Universitätsmedizin Berlin is a cosignatory of the ‘Basel Declaration’, an agreement dedicated to replacing and/or refining animal models for research purposes.

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