NOTE: Please save this file locally before filling in the table, DO NOT work on the file within your internet browser as changes will not be saved. Adobe Acrobat Reader (available free here) is recommended for completion.

The ARRIVE guidelines 2.0: author checklist

The ARRIVE Essential 10

These items are the basic minimum to include in a manuscript. Without this information, readers and reviewers cannot assess the reliability of the findings.

Item		Recommendation	Section/line number, or reason for not reporting
Study design	1	For each experiment, provide brief details of study design including: a. The groups being compared, including control groups. If no control group has been used, the rationale should be stated. b. The experimental unit (e.g. a single animal, litter, or cage of animals).	N/A, this is a preliminary cage of animals
Sample size	2	a. Specify the exact number of experimental units allocated to each group, and the total number in each experiment. Also indicate the total number of animals used. b. Explain how the sample size was decided. Provide details of any *a priori* sample size calculation, if done.	3 pigs were used without grouping 10 pulmonary nodules in each pig (30 in total) were selected into this study for preliminary evaluating the safety and effectiveness of this technology, without sample size calculation
Inclusion and exclusion criteria	3	a. Describe any criteria used for including and excluding animals (or experimental units) during the experiment, and data points during the analysis. Specify if these criteria were established *a priori.* If no criteria were set, state this explicitly. b. For each experimental group, report any animals, experimental units or data points not included in the analysis and explain why. If there were no exclusions, state so. c. For each analysis, report the exact value of *n* in each experimental group.	there is no specific including criteria. The pigs used were all 45kg Danish Landrace Pigs in SPF-class. The excluding criteria is pigs with pulmonary disease such as pneumonia. there were no exclusions. no group in this study.
Randomisation	4	a. State whether randomisation was used to allocate experimental units to control and treatment groups. If done, provide the method used to generate the randomisation sequence. b. Describe the strategy used to minimise potential confounders such as the order of treatments and measurements, or animal/cage location. If confounders were not controlled, state this explicitly.	There is no group, so randomisation was not used. The order of treatments and measurements or animal location do not affect the results.
Blinding	5	Describe who was aware of the group allocation at the different stages of the experiment (during the allocation, the conduct of the experiment, the outcome assessment, and the data analysis).	This is a cohort animal study for preliminary evaluation of a new technology. Blinding was not applied.
Outcome measures	6	a. Clearly define all outcome measures assessed (e.g. cell death, molecular markers, or behavioural changes). b. For hypothesis-testing studies, specify the primary outcome measure, i.e. the outcome measure that was used to determine the sample size.	Distances and angles were all accurately detected in corresponding software. There is no specific primary outcome measures.
Statistical methods	7	a. Provide details of the statistical methods used for each analysis, including software used. b. Describe any methods used to assess whether the data met the assumptions of the statistical approach, and what was done if the assumptions were not met.	Average and standard deviation were calculated using SPSS26.0. Not applicable.Only average and standard deviation were calculated.
Experimental animals	8	a. Provide species-appropriate details of the animals used, including species, strain and substrain, sex, age or developmental stage, and, if relevant, weight. b. Provide further relevant information on the provenance of animals, health/immune status, genetic modification status, genotype, and any previous procedures.	Three female 12 months 45kg Danish Landrace Pigs in SPF-class were used in this study These pigs were wild type and provided by Silversnake Biomedicine Technology Co., Ltd (Shanghai, China)
Experimental procedures	9	For each experimental group, including controls, describe the procedures in enough detail to allow others to replicate them, including: a. What was done, how it was done and what was used. b. When and how often. c. Where (including detail of any acclimatisation periods). d. Why (provide rationale for procedures).	pigs were anesthetized, the ventilator was connected, and vital signs were monitored. Natural pulmonary structures, such as lymphonodus and bifurcation of bronchiole Anytime when everything was ready. There is no special requirements about time and frequency. hybrid operation room with CT scan What was done in the animal study was physical operation, instead of chemical or genetic interference. Therefore, only normal pulmonary anatomical structure and
Results	10	For each experiment conducted, including independent replications, report: a. Summary/descriptive statistics for each experimental group, with a measure of variability where applicable (e.g. mean and SD, or median and range). b. If applicable, the effect size with a confidence interval.	The average angle between the actual puncturing needle and the expected path was 14.52° ± 6.04°. Meanwhile, the average distance between the puncture point and the expected point was 8.74 ± 5.07 mm, Not applicable

The Recommended Set

These items complement the Essential 10 and add important context to the study. Reporting the items in both sets represents best practice.

Item		Recommendation	Section/line number, or reason for not reporting
Abstract	11	Provide an accurate summary of the research objectives, animal species, strain and sex, key methods, principal findings, and study conclusions.	line 33-53
Background	12	a. Include sufficient scientific background to understand the rationale and context for the study, and explain the experimental approach. b. Explain how the animal species and model used address the scientific objectives and, where appropriate, the relevance to human biology.	line 57-77 line 103-126
Objectives	13	Clearly describe the research question, research objectives and, where appropriate, specific hypotheses being tested.	line 88-89
Ethical statement	14	Provide the name of the ethical review committee or equivalent that has approved the use of animals in this study, and any relevant licence or protocol numbers (if applicable). If ethical approval was not sought or granted, provide a justification.	line 101-102
Housing and husbandry	15	Provide details of housing and husbandry conditions, including any environmental enrichment.	line 104. The pigs used in this study were hous
Animal care and monitoring	16	a. Describe any interventions or steps taken in the experimental protocols to reduce pain, suffering and distress. b. Report any expected or unexpected adverse events. c. Describe the humane endpoints established for the study, the signs that were monitored and the frequency of monitoring. If the study did not have humane endpoints, state this.	line 107-113 no adverse events happened. line 112-113. vital signs were continuously monitored. They were clam and general anesthetized throughout the whole study.
Interpretation/ scientific implications	17	a. Interpret the results, taking into account the study objectives and hypotheses, current theory and other relevant studies in the literature. b. Comment on the study limitations including potential sources of bias, limitations of the animal model, and imprecision associated with the results.	line 262-268 line 268-270
Generalisability/ translation	18	Comment on whether, and how, the findings of this study are likely to generalise to other species or experimental conditions, including any relevance to human biology (where appropriate).	line 272-275
Protocol registration	19	Provide a statement indicating whether a protocol (including the research question, key design features, and analysis plan) was prepared before the study, and if and where this protocol was registered.	Not applicable. There is no protocol used in this study.
Data access	20	Provide a statement describing if and where study data are available.	line 290
Declaration of interests	21	a. Declare any potential conflicts of interest, including financial and non-financial. If none exist, this should be stated. b. List all funding sources (including grant identifier) and the role of the funder(s) in the design, analysis and reporting of the study.	line 286-287 line 277-281

Article Information: https://dx.doi.org/10.21037/tlcr-21-554

*As the checklist was provided upon initial submission, the section/line number reported may be changed due to copyediting and may not be referable in the published version.