# FY2023 New
# Assembly/Committee Project Application

Submitter: **Melanie Koenigshoff**

All products or works, whether in writing or in another form, that are created partly or completely with the assistance of funding provided by the American Thoracic Society will be the intellectual property of the ATS exclusively, unless otherwise stipulated in writing by the ATS. The disposition of these products or works will be at the sole discretion of the ATS. Recipients agree, as a condition of receipt of ATS funding, that ATS owns the copyright and all other rights to these products or works.

Collaboration: There will be opportunities for other organizations to co-sponsor the document. The ATS prefers that the project not be discussed with potential co-sponsoring organizations until the project has been approved because premature discussions may jeopardize a final agreement. All negotiations for collaboration will be handled by ATS staff following project approval.

## SECTION I - GENERAL PROJECT INFORMATION

* 1. ATS PROJECT TITLE:

Precision cut lung slices (PCLS): emerging tools for preclinical and translational lung research

* 2. PROJECT PRIMARY ASSEMBLY:

Respiratory Cell & Molecular Biology

* 3. ATS SECTION:

*-- empty --*

* 4. ATS COMMITTEE SUBMITTING PROJECT APPLICATION:

*-- empty --*

* 5. What official ATS document will be developed as part of this project?

Workshop Report

* 6. Can the project move forward as a virtual project if necessary?

Yes

## SECTION II - RELEVANCE to ATS

### PROJECT DESCRIPTION

* A. Clearly and concisely describe the project's goals, objectives, and relevance/importance to the ATS. Goals and objectives should be focused and feasible to achieve. Do NOT include your meeting agenda here. If you are proposing a clinical practice guideline, this section should include your PICO question(s). (maximum of 6 questions are permitted)

Acute and chronic lung diseases are among the leading causes of death and represent a major health and financial burden on patients and society. The pathology of lung diseases is complex and heterogeneous, and discovery and development of new therapeutics remains a challenging task. Most lung diseases are without a cure. Thus, there is an urgent unmet need to identify more effective and targeted treatments. To achieve this, novel approaches and clinically relevant model systems are needed to explore disease pathomechanisms and, more importantly, to validate potential new targets and drugs. Animal models have contributed tremendously to the understanding of disease pathomechanisms. At the same time, they do not sufficiently mimic the nature and complexity of the native human tissue, and in some cases, such as with species-specific infections, animals cannot be used to model human disease. In the past, the transfer of novel potential therapeutic targets from animal models of disease to patients has failed, largely due to limited reflection of the human disease in the animal model. This further highlights the need for better human lung ex vivo modeling to evaluate pharmacological interventions prior to clinical trials.**This workshop will focus on an emerging new human lung tissue based translational model, precision-cut lung slices (PCLS), which has evolved as an exciting opportunity to advance lung disease research and accelerate novel therapies**. Recently, improved methodology and accessibility to human tissue has led to increased interest and usage of PCLS to be applied for lung disease modeling, facilitating mechanistic interrogation, drug discovery, and pre-clinical drug validation by a rapidly increasing number of investigators within the ATS community. PCLS from healthy and diseased human tissue are a promising tool which can 1) recapitulate the complexity of the lung's native environment, 2) enable the study of the complex interactions among different cell types and the extracellular matrix in the lungs' native 3D architecture, 3) allow for high resolution (live)imaging of cellular functions in several dimensions, and 4) mimic the onset and progression of lung diseases, complementing studies in end-stage diseased tissue. Importantly, this technology is low cost and feasible for many labs based on tissue access and even

more importantly, protocols are under active development that allow tissues to be prepared and shared with laboratories that don't have human tissue access themselves, thus making PCLS technically accessible to many translational lung research labs. **Altogether, PCLS are emerging as a remarkable tool to further bridge the gap between target identification and translation into clinical studies and thus are a novel tool with broad applications from basic to clinical research in pulmonary medicine**.

**Goal:**To define standardized generation, applications, and experimental readouts for the use of Precision Cut Lung Slices (PCLS) that will serve as consensus standard in the field.

**Objectives:**

1. To publicly highlight the relative advantages and disadvantages of existing methods used for generating and characterizing PCLS.
2. To consider recent methodological and technological advances for assessing PCLS
3. To provide general guidance concerning methods to generate and culture PCLS and novel and innovative endpoints and experimental readouts that can be applied.

**Relevance/ Importance to ATS:**

Publications with "PCLS",The usage of PCLS as a preclinical model within the ATS community is clearly on the rise. While at ATS 2020 8 abstracts contained "PCLS" or Precision Cut Lung Slices, this increased to 18 at ATS 2021. At this year´s ATS 2022, there were 31 abstracts utilizing "PCLS" and 19 sessions containing PCLS, including thematic poster session, (RAPiD) Poster discussions, mini symposia and symposia abstracts utilizing PCLS, further highlighting the attention this technology is gaining. Notably, there was a whole scientific symposium " D9:Precision cut lung slices: Use and applications of an ex vivo technique for pulmonary research" focused on the usage of PCLS that gained a lot of attention and had over 100 participants on a Wednesday afternoon. The speakers included clinicians, basic scientists and representatives from industry highlighting the broad applicability of PCLS use in the ATS community. Participants covered multiple assemblies including RCMB, RSF, AII, CP, and EPOH.

The review "Applications and Approaches for Three-Dimensional Precision-Cut Lung Slices. Disease Modeling and Drug Discovery" published in the AJRCMB in 2020 is one of the highest cited papers of the AJRCMB 2021, which highlights current research findings. **The rise in interest and usage as well as the advancement in methods and technology have created the need for a consensus on PCLS methodology and readouts.** Advances in optical imaging, genetic tools, bioinformatics, computational sciences, and "omics" technology, as well as cellular biology, allow new insights into and uses for this model. These advancements have also increased the complexity of the understanding PCLS

methodology and provided additional challenges as well as opportunities for translational research. This project should be prioritized this current year, because of the following reasons:

1) Recent advances in technology and readouts allow for detailed characterization of PCLS, advancing our understanding of the method significantly. Thus, now is the time for protocols to be discussed among experts and opinion leaders, streamlined and shared to increase reproducibility and allow for sharing of data and material. This has been a major discussion point in anym online (DocMatter) or in person (ATS) discussions. Clinicians and scientists need to develop a better understanding for the potential applications and usefulness of the method as well as importantcontrols and limitations that need to be considered. Here we want to provide a context to adequately generate and interpret PCLS experimental design and results.

2) A workshop would provide an optimal platform to discuss controversies, potential and future directions of the research such as definition of culture medium, culture time and conditions, storage and cryopreservation, genetic modification, and standardized readouts and endpoints.

3) The need for better translational models utilizing human tissue has been recognized by government as well as private funding agencies. Currently, there is a NHLBI U01 consortium focused on better models for pulmonary fibrosis, which includes the use of PCLS. NIEHS is planning a workshop focusing on human tissue-based models for exposure studies. In addition, the Three Lakes Foundation supports a nation-wide consortium effort for the use of PCLS as a model for drug discovery, among others.

4) The method is gaining considerable attention by the pharmaceutical industry as a preclinical model to test pharmacological therapeutics in a human ex vivo system, with several Phase II and at least one Phase III drug, which hasve been tested in PCLS beforehand. As a part of this workshop, we will evaluate the generation, culture and storage conditions of PCLS to enhance the reproducibility and validity of the model across different laboratories. **As the leading professional society in pulmonary and critical care medicine and with ATS members being pioneers in establishing PCLS models, it is imperative for the ATS to publish state-of-the-art recommendations in a timely manner.**

With an exponentially growing number of studies, the need for a consensus on PCLS research has been voiced and the relevance and timeliness of this workshop applications has been endorsed by multiple ATS Assemblies/Chairs, including Respiratory, Cell and Molecular Biology (RCMB, Enid Neptune), Respiratory Structure and Function (RSF, Janette Burgess), Environmental and Occupational Health (EOPH, Ilona Jaspers), and Allergy Inflammation and Immunology (AII, Anne Sperling). We would like to highlight that the relevance of PCLS for preclinical drug validation is also recognized by more clinically focused assemblies such as Clinical Problems (Brad Drummond). Importantly, several recent studies identifying novel drugs that have entered Phase II and Phase III clinical Trials have used PCLS as a

decision tool (Decaris et al. 2021; Hettiarachchi et al. 2020).

While other 3D models, such as organoid, or other tissue explant cultures, are on the rise and important to consider, the workshop will focus primarily on PCLS to be able to generate in-depth discussions about the multiple aspects of this technology that are important to develop the full potential and applicability of this methodology. We integrated a session on complimentary other models (Topic 5) to include a discussion about advantages and limitations that are important to consider for future studies. This approach allows for concrete recommendations about PCLS processing, procurement, disease modeling, drug discovery and considerations about endpoint analysis and future readouts.

The Editor of the American Journal of Respiratory, Cell and Molecular Biology (Dr. Paul Schumacker) has voiced his enthusiasm for consideration of a Workshop Report, also in light of the impactful and highly cited recent review (Alsafadi et al. 2020), corroborating the increasing interest and recent advances in PCLS for (pre)clinical research. We have also obtained feedback from Dr. Kevin Wilson (Chief, Documents & Medical Affairs), and incorporated their feedback to make sure to obtain concrete recommendations from the community during the workshop.

By being the first professional society setting criteria for PCLS research we will be able to provide value to researchers, clinicians and indirectly, patients – by better modeling human disease– and ensuring proper usage for scientists from academia and industry as well as to funding agencies, by providing a consensus standard for the field and general guidance regarding the use of PCLS.

* B. Describe any related ATS / non-ATS activities relevant to your project.

There has been recent interest in PCLS highlighted by the huge success of **PCLS centered symposium at the recent ATS** annual meeting " D9:Precision cut lung slices: Use and applications of an ex vivo technique for pulmonary research" plus 18 other sessions involving PCLS research. Furthermore, there has been a **very active and informative DocMatter Discussion** centered around the use of PCLS and the need to standardize methods and methodology involving 10 researchers across different assemblies and a total of 20 comments, which brought the current group together. PCLS have been presented as part of **ATS webinars**, such as the Webinar organized by the ATS Interest Group of Aging in June 2021.

* C. How does this project relate to health equality? How will health equality be addressed in this project?

This workshop addresses health equality in several ways: The PCLS technology itself will allow researchers a greater ability to study complex human tissues. This will translate into the ability to analyze samples that accurately reflect **patients' demographics** including (sex, age, race, geography) in a way that has been inaccessible until now. Representing **ethnic diversity in preclinical trials** is an important aspect of health equality. The workshop and the resulting report will address this issue and

provide recommendations to this point. Moreover, within the Workshop, we have prioritized the **inclusion of elite researchers from diverse backgrounds** in all sessions since we recognize that diversity is a critical component of scientific advancement and innovation.

* D. All applicants must review a document development video ( https://www.thoracic.org/members/assemblies/about/assembly-project-application-resource-center.php) and set of document-development vignettes prior to submitting this application.

Yes, I have review the document development video

E. FOR CME EDUCATIONAL PROJECTS/PRODUCTS ONLY: FOR MORE INFORMATION PLEASE SEE INSTRUCTIONS. PLEASE DESCRIBE THE FOLLOWING:

☑ Not Applicable

## SECTION III - METHODOLOGY

* A. Please describe the approach for creating the document. This section should demonstrate that the scope of work can be completed on time. There should be a clear plan for how tasks, such as paper writing, will be completed (e.g., how will writing tasks be divide? what are the opportunities for the committee to provide feedback?). Please include why you feel the selected document type is the most appropriate.

The goal of this proposal is to produce a Workshop Report that describes measurements and features of PCLS generation, culture, preservation (Topic 1), modeling (Topic 2) and experimental readouts including state-of-the-art imaging and omics-approaches (Topic 3) and integrate a session with a focus on translational preclinical studies (Topic 4). Within the final session, we will discuss future approaches and directions in PCLS research (Topic 5). This schedule allows for concrete recommendations about PCLS processing, procurement, disease modeling and drug discovery, and considerations about endpoint analysis and future readouts.

**Topics to cover:**

1. PCLS generation, cultivation and preservation / standardization of procurement/ processing and optimization– Discussion Lead: Ramaswamy Krishnan, Harvard, USA
2. PCLS disease models / injury and repair/ diseased tissue - Discussion Lead- Mareike Lehmann, University of Marburg, Germany
3. PCLS readouts multiomics / Imaging - Discussion Lead: Jennifer Sucre, Vanderbilt University
4. PCLS end points/ biomarkers / translational readouts / clinical biomarkers– Discussion Lead: Ivan Rosas, Baylor College of Medicine
5. PCLS future directions– Discussion Lead: Melanie Königshoff, University of Pittsburgh

The outline of the project is below:
4 Co-Chairs including one early career faculty member (Drs. Melanie Königshoff, Mauricio Rojas, Jane Bourke, and Mareike Lehmann (ECP)) will direct the project. Drs Königshoff and Lehmann will be responsible for timely completion of tasks and the workshop report. Five leaders have been assigned for each of the topics (Drs. Ramaswamy Krishnan, Melanie Königshoff, Mareike Lehmann (ECP), Jennifer Sucre (ECP), Ivan Rosas) and have enthusiastically agreed to participate in the approved workshop. The co-chairs and the topic experts will form the writing group (7 members total). We have further identified a panel of experts with general expertise in PCLS as well as specialized expertise in the distinct topics that will be important to integrate into the discussion during the workshop. Each discussion will be led by a discussion leader and an early career representative.

**Introductory Webinar (1st webinar)** In the webinar, the Co-Chairs will introduce the topic to all participants of the workshop (see Participants lists below) to review the workshop and the plan for a report. The webinar will be used to align expectations and define ideas. The webinar will be recorded and distributed to all participants of the workshop. During the webinar we will refine the questions that we want to answer to address our 6 defined topic areas and conduct a questionnaire after the webinar asking

1. Baseline demographics (Sex, race, ethnicity)
2. What is your current position?
3. What is your career stage?
4. What is your major area of disease focus?
5. What is your primary ATS assembly?
6. What is your current knowledge about PCLS (Scale 1-5)
7. How often do you use PCLS in your research?
8. Are you interested in a specific disease pathomechanism?
9. Do you use PCLS for mechanistic studies, screening or validation?
10. How do you generate and culture PCLS?
11. What readouts are important for your studies?
12. What do you think needs standardization?
13. Which limitations do PCLS exhibit?
14. For what do you wish to apply to PCLS in the future?
15. Which resources have you used/found useful for PCLS studies?
16. Do you have any additional questions you would like to address in the workshop?

The topic leaders will collect the answers and prepare a summary to be presented at the 2nd Webinar. Participants not able to join the webinar will have the opportunity to answer the questions afterwards online.

**Pre-Meeting webinar (2nd webinar)**

Results from the questionnaires will be presented and discussed in breakout rooms with the 5 respective topic discussion leaders and will be used to refine the workshop agenda. Each topic will have approx. 4-6 participants. Participants will be assigned to the topics based on interest and expertise in the first webinar.

**In-person workshop:** All participants will be asked to participate in the one-day workshop at the 2023 American Thoracic Society Conference. If required, the workshop can be shifted to a fully virtual format. At the workshop, we will introduce the workshop and outline the current state of the field. We will start the discussion of the topics with an opening 10 min presentation presenting the results from the Webinars to set the stage for the Workshop. Afterwards, each topic outlined below will have 2 short talks followed by an interactive discussion 45 mins. Each topic has two designated chairs including the discussion leader and one early career member to facilitate discussion. Areas of agreement and disagreement will and potential issues with methodologies will be documented by the chairs. Additionally, a Google document containing an outline for each topic will be provided, allowing and encouraging all individuals present to type comments/questions etc. into this common document during the discussion. As such, all participants can contribute to the discussion and a wide range of feedback is ensured. The topic leaders will compile the suggestions for each of their domains.

**Deliverable:** After the in-person workshop, the writing group (comprising of the co-chairs and discussion leads) will develop a Workshop Report reflecting the discussion of the workshop participants on the relevance of standardization of PCLS culture and experimental readouts based on the questionnaires and the workshop. They will develop a consensus statement on the relevance of each of the five areas as well as future directions for research involving PCLS.

**General Meeting Structure**: The structure will be a daylong meeting during the 2023 American Thoracic Society International Conference. It is planned in a way that it could be easily converted to an online meeting should this be necessary. The meeting will be divided into seven sessions. There will be a 10min plenary session by an investigator who will provide a perspective on how the field of PCLS has evolved, and what kind of challenges arise by this. We will have five sessions, focusing on the identified 5 topics. Each topic will be discussed separately over a 1.5 hour period. The topic leader will first introduce the topic in a 10 min rapid talks. Following this, there will be 2 short talks by experts in the field, followed by a 45 min open discussion for every topic where participants will be encouraged to actively discuss the specific topic.Discussion points will be focused on the specific topic and the question we want to address in the report. Topic 1: This topic focuses on PCLS generation, cultivation and preservation and aims to develop recommendations for standardization of procurement/ processing and optimizationTopic 2: PCLS disease models. Which injury/ disease models and readouts can be modeled in PCLS, what are the advantages and potential limitations, how would proof of concept studies look like. If working with diseased tissue adaptations to generation, cultivation and preservation are required. Topic 3: Which

advanced readouts can we recommend for mechanistic studies in PCLS? We will focus on multi-omic approches and advanced imaging techniques.Topic 4: The discussion will focus on how we can develop and measure quantitative translational readouts and relevant clinical biomarkers and especially on the standardization required for preclinical models. Topic 5: The discussion will focus on future directions for PCLS research such as advancement of the model system with bioreactors and genetic modifications.

**Tentative Plan:**

07:00-7:10 Introduction to the workshop (Mareike Lehmann/Mauricio Rojas)

07:10-07:20 Current state of the field (Melanie Koenigshoff/ Jane Bourke)

07:20-07:30 Discussion Topic 1: Chair Ramaswamy Krishnan and Amanda Tatler (ECP)

**07:30- 07:40 Rapid Introduction Topic 1 – Ramaswamy Krishnan (USA)**

07:40-07:50 Short Talk 1 Katharina Sewald (Germany)

07:50-08:00 Short Talk 2 Holger Behrsing (USA)

08:00-08:45 Discussion 08:4530-09:00 Break Topic 2: Chair Mareike Lehmann (ECP) and Mauricio Rojas

**09:00-09:10 Rapid Introduction Topic 2 – Mareike Lehmann (Germany)**

09:10-09:20 Short Talk 1 Reinoud Gosens (Netherlands)

09:20-09:30 Short Talk 2 Julia Herbert (USA)

09:30-10:15 Discussion

10:15-10:30 Break Topic 3: Chair Jennifer Sucre (ECP) and Scott Randall

**10:30-10:40 Rapid Introduction Topic 3 – Jennifer Sucre (USA)**

10:40 -10:50 Short Talk 1 Nick Banovich (USA)

10:50-11:00 Short Talk 2 Charlotte Dean (UK)

11:00-11:45 Discussion

11:45-12:45 12:15-13:5 Lunch Break Topic 4: Chair: Ivan Rosas and Darcy Wagner (ECP)

**12:45-12:55 Rapid Introduction Topic 4 – Ivan Rosas (USA)**

12:55-13:05 Short Talk 1 Jane Bourke (Australia)

13:05-13:15 Short Talk 2 Scott Turner (USA)

13:15-14:10 Discussion

14:10-14:25 Break Topic 5: Chair: Melanie Königshoff and Hrish Kulkarni (ECP)

**14:25-14:35 Rapid Introduction Topic 5 – Melanie Königshoff (USA)**

14:35-14:450 Short Talk 1 Amanda Tatler (UK)

14:45-14:55 Short Talk 2 Bela Suki (USA)

14:55-15:40 Discussion

15:40-15:55 Break

15:55- 17:00 Summary and concluding remarks (Co-Chairs and Discussion Leads, all participants)

**Document Preparation** The writing committee will be led by the co-chairs (Drs Melanie Königshoff,

Mauricio Rojas, Jane Bourke and Mareike Lehmann) and include discussion leaders (Drs Ramaswamy Krishnan, Jennifer Sucre, Ivan Rosas). Drs Königshoff and Lehmann will be responsible for timely completion of tasks and the workshop report. A reference lists and a draft of recommendations of each topic will be provided by the discussion leads during the workshop will form the basis of the manuscript. Following the meeting, the discussion leaders will prepare a summary of their findings of the questionnaire and the workshop discussions which will be refined by the co-chairs. The Google document containing comments from all participants collected during the workshop will provide a basis for discussion and consensus of all workshop participants in the report. The co-chairs will summarize the importance of the different topics as discussed in the workshop. General guidance on PCLS generation, cultivation, preservation as well as basic readouts will be included in the document.
The report resulting from the proposal would unite important discussion points on PCLS. It would (1) publicly highlight the relative advantages and disadvantages of PCLS and their use in translational research, (2) discuss recent advancements in methodology and technology in the analysis of PCLS and (3) provide guidance on general steps for PCLS generation, cultivation, preservation as well as on common readouts as the basis for discussing the six topics, along with a media presence to support dissemination of this material. This would provide important information to the pulmonary community and serve as an instrument for investigators from both academia and industry to plan preclinical experiments on PCLS. This Workshop report will likely be highly cited, similar output, such as the 2020 review on PCLS Applications and Approaches in the AJRCMB. Importantly, the Workshop report will expand on the topics introduced in this review and further include several recent advancements in methodology and technologies that have been developed, applied, and emerged over the past two years, as presented by at ATS 2021 and ATS 2022, which highlighted the need for a consensus on PCLS methodology and readouts.

* B. If you are requesting a face-to-face meeting, please provide a detailed agenda that includes:

- the topic/activity
- the presenter/discussant/group leader name(s),
- start time
- duration (if not clear from the next topic/activity's start time).

*Tip. In person meetings are most successful when there is ample time for discussion spread throughout the meeting. It is often helpful to document group/sub-group discussion as a separate topic/activity.*
[Meeting_Structure_ATS_Workshop_PCLS_2022.docx]

* If you have chosen to develop a Workshop Report as part of this project, please complete a draft agenda below for the workshop. Please click "add new" to add a new agenda item.

**Start Time** : 7:00 AM

**End Time** : 7:09 AM

**Title of Talk or Function** : Introduction

**Speaker Name** : Lehmann/Rojas

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**Start Time** : 7:10 AM

**End Time** : 7:19 AM

**Title of Talk or Function** : Current state of the field

**Speaker Name** : Koenigshoff/Burke

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**Start Time** : 7:20 AM

**End Time** : 7:29 AM

**Title of Talk or Function** : Discussion

**Speaker Name** : all

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**Start Time** : 7:30 AM

**End Time** : 7:39 AM

**Title of Talk or Function** : Rapid Intro Topic 1

**Speaker Name** : Krishnan/Tatler

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**Start Time** : 7:40 AM

**End Time** : 7:49 AM

**Title of Talk or Function** : Topic 1 Short Talk 1

**Speaker Name** : Sewald

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**Start Time** : 7:50 AM

**End Time** : 7:59 AM

**Title of Talk or Function** : Topic 1 Short Talk 2

**Speaker Name** : Behrsing

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**Start Time** : 8:00 AM

**End Time** : 8:44 AM

**Title of Talk or Function** : Topic 1 Discussion

**Speaker Name** : all

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**Start Time** : 8:45 AM

**End Time** : 8:59 AM

**Title of Talk or Function** : BREAK

**Speaker Name** : all

**Start Time** : 9:00 AM

**End Time** : 9:09 AM

**Title of Talk or Function** : Rapid Intro Topic 2

**Speaker Name** : Lehmann/Rojas

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**Start Time** : 9:10 AM

**End Time** : 9:19 AM

**Title of Talk or Function** : Topic 2 Short Talk 1

**Speaker Name** : Gosens

---

**Start Time** : 9:20 AM

**End Time** : 9:29 AM

**Title of Talk or Function** : Topic 2 Short Talk 2

**Speaker Name** : Herbert

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**Start Time** : 9:30 AM

**End Time** : 10:14 AM

**Title of Talk or Function** : Topic 2 Discussion

**Speaker Name** : all

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**Start Time** : 10:15 AM

**End Time** : 10:29 AM

**Title of Talk or Function** : BREAK

**Speaker Name** : all

---

**Start Time** : 10:30 AM

**End Time** : 10:39 AM

**Title of Talk or Function** : Rapid Intro Topic 3

**Speaker Name** : Sucre/Randall

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**Start Time** : 10:40 AM

**End Time** : 10:49 AM

**Title of Talk or Function** : Topic 3 Short Talk 1

**Speaker Name** : Banovich

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**Start Time** : 10:50 AM

**End Time** : 10:59 AM

**Title of Talk or Function** : Topic 3 Short Talk2

**Speaker Name** : Dean

**Start Time** : 11:00 AM

**End Time** : 11:44 AM

**Title of Talk or Function** : Topic 3 Discussion

**Speaker Name** : all

**Start Time** : 11:45 AM

**End Time** : 12:44 PM

**Title of Talk or Function** : LUNCH BREAK

**Speaker Name** : all

**Start Time** : 12:45 PM

**End Time** : 12:54 PM

**Title of Talk or Function** : Rapid Intro Topic 4

**Speaker Name** : Rosas/Wagner

**Start Time** : 12:55 PM

**End Time** : 1:04 PM

**Title of Talk or Function** : Topic 4 Short Talk 1

**Speaker Name** : Burke

**Start Time** : 1:05 PM

**End Time** : 1:14 PM

**Title of Talk or Function** : Topic 4 Short Talk 2

**Speaker Name** : Turner

**Start Time** : 1:15 PM

**End Time** : 2:09 PM

**Title of Talk or Function** : Topic 4 Discussion

**Speaker Name** : all

**Start Time** : 2:10 PM

**End Time** : 2:24 PM

**Title of Talk or Function** : BREAK

**Speaker Name** : all

**Start Time** : 2:25 PM

**End Time** : 2:34 PM

**Title of Talk or Function** : Rapid Intro Topic 5

**Speaker Name** : Koenigshoff

**Start Time** : 2:35 PM

**End Time** : 2:44 PM

**Title of Talk or Function** : Topic 5 Short Talk 1

**Speaker Name** : Tatler

**Start Time** : 2:45 PM

**End Time** : 2:54 PM

**Title of Talk or Function** : Topic 5 Short Talk 2

**Speaker Name** : Suki

**Start Time** : 2:55 PM

**End Time** : 3:39 PM

**Title of Talk or Function** : Discussion

**Speaker Name** : all

**Start Time** : 3:40 PM

**End Time** : 3:54 PM

**Title of Talk or Function** : BREAK

**Speaker Name** : all

**Start Time** : 3:55 PM

**End Time** : 4:59 PM

**Title of Talk or Function** : Summary and concluding remarks

**Speaker Name** : Co-Chairs and Discussion Leads, all participants

* C. PROPOSED PARTICIPANTS - *Every guideline must have a methodologists. Please include all proposed participants. For more details contact ATS Documents Department documents@thoracic.org*

- Include a list of all planned participants. For '**area of expertise relevant to the project**', provide sufficient detail to justify the person's inclusion on this project and to demonstrate their role on the project. For example, this could include specific clinical or research expertise and/or prior experience with document development.
- Before beginning work on the project all participants will have their conflict of interest disclosures vetted by the ATS. If the project is co-sponsored by other societies or groups, there may be approvals required before a participant can be formally added to the project committee.

**Name** : Jane Bourke, PhD
**Institution** : Monash University, Australia
**"Role" on Project committee** : Co Chair
**Area of Experties relevant to project** : Respiratory pharmacology in PCLS; RSF
**Email** : jane.bourke@monash.edu
**Airfare** : Domestic
**Country** : Australia

**Name** : Melanie Königshoff, MD, PhD
**Institution** : University of Pittsburgh
**"Role" on Project committee** : Chair
**Area of Experties relevant to project** : Chronic lung disease modeling and drug discovery in PCLS; RCMB
**Email** : koenigshoffm@upmc.edu
**Airfare** : Domestic
**Country** : United States

**Name** : Mareike Lehmann, PhD
**Institution** : Philipps University Marburg
**"Role" on Project committee** : Chair
**Area of Experties relevant to project** : Aging related mechanisms in PCLS, RCMB
**Email** : mareike.lehmann@helmholtz-muenchen.de
**Airfare** : International
**Country** : Germany

**Name** : Mauricio Rojas, MD
**Institution** : University of Ohio, USA
**"Role" on Project committee** : Co Chair
**Area of Experties relevant to project** : PCLS as IPF model, RCMB

**Email** : Mauricio.Rojas@osumc.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Ramaswamy Krishnan, PhD

**Institution** : Harvard Medical Center, USA

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Mechanical engineering, stretch, airway contractility, cryopreservation; RC;B

**Email** : Rkrishn2@bidmc.harvard.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Scott Randell, PhD

**Institution** : The University of North Carolina, USA

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Airway tissue explants and distal lung preps as complimentary approach to PCLS; RCMB

**Email** : scott_randell@med.unc.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Ivan Rosas, MD

**Institution** : Baylor College of Medicine, USA

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Preclinical testing in PCLS; CP

**Email** : ivan.rosas@bcm.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Jennifer Sucre, MD PhD

**Institution** : Vanderbilt University

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Imaging of PCLS, pediatric PCLS

**Email** : jennifer.sucre@vanderbilt.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Christopher Anderson, PhD

**Institution** : URMC, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Optimization of PCLS generation, pediatric lung disease; RCMB

**Email** : Christopher_Anderson@urmc.rochester.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Nicholas Banovich, PhD

**Institution** : Translational Genomics Research Institute, USA

**"Role" on Project committee** : Speaker

**Area of Experties relevant to project** : Omics approachs for PCLS; RCMB

**Email** : nbanovich@tgen.com

**Airfare** : Domestic

**Country** : United States

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**Name** : Holger Behrsing, PhD

**Institution** : Insitute for In Vitro Sciences

**"Role" on Project committee** : Speaker

**Area of Experties relevant to project** : PCLS generation and storage, Predictive Toxicology in PCLS; EOPH

**Email** : hbehrsing@iivs.org

**Airfare** : Domestic

**Country** : United States

---

**Name** : Charlotte Dean, PhD

**Institution** : mperial College London, UK

**"Role" on Project committee** : Speaker

**Area of Experties relevant to project** : PCLS live imaging, Alveologenesis, Regeneration models; RSF

**Email** : c.dean@imperial.ac.uk

**Airfare** : International

**Country** : United Kingdom

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**Name** : Reinoud Gosens, PhD

**Institution** : University Medical Center Groningen, Netherlands

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : COPD, pro-regenerative modeling in PCLS; RSF

**Email** : r.gosens@rug.nl

**Airfare** : International

**Country** : Netherlands

**Name** : Naftali Kaminski, MD
**Institution** : Yale University, USA
**"Role" on Project committee** : Member
**Area of Experties relevant to project** : Staging of IPF tissue, drug discovery and validation in PCLS; RCMB
**Email** : naftali.kaminski@yale.edu
**Airfare** : Domestic
**Country** : United States

**Name** : Timothy R. Watkins, MD MSc
**Institution** : Gilead Sciences Inc.
**"Role" on Project committee** : Speaker
**Area of Experties relevant to project** : Executive Director, Clinical Research, Respiratory Disease Area Lead Inflammation Therapeutics,; CP, DDDD
**Email** : Tim.Watkins@gilead.com
**Airfare** : Domestic
**Country** : United States

**Name** : Sumita Kathri, MD
**Institution** : Cleveland Clinic, USA
**"Role" on Project committee** : Member
**Area of Experties relevant to project** : PCLS imaging; AII
**Email** : KHATRIS@ccf.org
**Airfare** : Domestic
**Country** : United States

**Name** : Cynthia Koziol-White, PhD
**Institution** : Rutgers University, USA
**"Role" on Project committee** : Member
**Area of Experties relevant to project** : E-cigarette expsoures in PCLS; EOPH
**Email** : cjk167@rbhs.rutgers.edu
**Airfare** : Domestic
**Country** : United States

**Name** : Yong Ho Kim, PhD
**Institution** : EPA, USA
**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Wildfire exposure, lung toxicity; EOPH

**Email** :

**Airfare** : Domestic

**Country** : United States

---

**Name** : Hrish Kulkarni, MD

**Institution** : Washington University of St Louis, USA

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Acute Lung Injury modeling in PCLS; AII

**Email** : hkulkarn@wustl.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Claudia Loebel, PhD

**Institution** : University of Michigan, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Cell ECM interaction, PCLS and complementary models (organoids)

**Email** : loebelcl@umich.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Frederica Michielin

**Institution** : University College London

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Decell PCLS, organoids

**Email** : f.michielin@ucl.ac.uk

**Airfare** : International

**Country** : United Kingdom

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**Name** : Enid Neptune, MD

**Institution** : John Hopkins University, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Translational COPD research, mucus modeling in PCLS; RCMB

**Email** : eneptune@jhmi.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Alexandra Noel, PhD

**Institution** : Louisiana State University, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Tobacco product delivery systems, ex vivo exposure to PCLS; EOPH

**Email** : anoel@lsu.edu

**Airfare** : Domestic

**Country** : United States

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**Name** : Ganesh Raghu

**Institution** : University of Washington

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : PCLS Pioneer, endpoints

**Email** : graghu@uw.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Katharina Seewald, PhD

**Institution** : Fraunhofer, Germany

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Standardization of PCLS for industry-grade preclinical testing ; RCMB

**Email** : katherina.sewald@item.fraunhofer.de

**Airfare** : International

**Country** : Germany

---

**Name** : Ashish Sharma, MD

**Institution** : University of Florida, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Lung transplantation, ischemia-reperfusion injury, PCLS generation; CP

**Email** : ashish.sharma@surgery.ufl.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Bela Suki, MD

**Institution** : Boston University, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Developing of a screening device based on stretchable PCLS; RSF

**Email** : bsuki@bu.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Anne Sperling, PhD

**Institution** : University of Virginia, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Immune response in Asthma and Allergy, PCLS modeling; AII

**Email** : anne.sperling@virginia.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Amanda Tatler, PhD

**Institution** : University of Nottingham, UK

**"Role" on Project committee** : Discussant

**Area of Experties relevant to project** : Novel approaches to PCLS modeling, RCMB

**Email** : Amanda.Tatler@nottingham.ac.uk

**Airfare** : International

**Country** : United Kingdom

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**Name** : Daniel Tschumperlin, PhD

**Institution** : Mayo Clinic, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : ECM regulation in PCLS; RCMB

**Email** : Tschumperlin.Daniel@mayo.edu

**Airfare** : Domestic

**Country** : United States

---

**Name** : Scott Turner, PhD

**Institution** : Pliant Pharmaceuticals, USA

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : PCLS for preclinical drug validation; RCMB

**Email** : sturner@pliantrx.com

**Airfare** : Domestic

**Country** : United States

---

**Name** : Ricardo Pineda

**Institution** : University of Pittsburgh

**"Role" on Project committee** : Member

**Area of Experties relevant to project** : Technologies forPCLS Generation
**Email** : ricardo.pineda@upmc.edu
**Airfare** : Domestic
**Country** : United States

**Name** : Gloria Pryhuber, MD
**Institution** : University of Rochester, USA
**"Role" on Project committee** : Member
**Area of Experties relevant to project** : LungMap, Biorepository, PCLS generation; RSF
**Email** : gloria.pryhuber@urmc.rochester.edu
**Airfare** : Domestic
**Country** : United States

**Name** : Dary Wagner
**Institution** : University of Lund
**"Role" on Project committee** : Discussant
**Area of Experties relevant to project** : Bioengineering approaches to PCLS
**Email** : darcy.wagner@med.lu.se
**Airfare** : International
**Country** : Sweden

* D. The ATS encourages diversity and inclusion on all its committees and projects and has identified several groups that have been historically under-represented on ATS committees. It may not be possible or needed to include all these groups on this project and there is no expected quota for diversity and inclusion. To facilitate the review of the proposed committee, please complete this summary of diversity and inclusion. Please indicated if your proposed participants include any of the following Underrepresented in Medicine Definition. Underrepresented in medicine means those racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general population.Underrepresented Group Group underrepresented in the biomedical, clinical, behavioral, and social sciences, such as people with disabilities, people from disadvantaged backgrounds, and underrepresented racial and ethnic groups such as blacks or African Americans, Hispanics or Latinos, American Indians or Alaskan Natives, and Native Hawaiians and other Pacific Islanders.

**Diversity** : Women
**How Many?** : 16
**Comments/Clarifications** : several women experts are included

**Diversity** : Underrepresented minorities in medicine

**How Many?** : 6

**Comments/Clarifications** : Several URMs are included

**Diversity** : Early career representatives

**How Many?** : 11

**Comments/Clarifications** : Several ECPs are included

**Diversity** : Non-MD/DO professionals

**How Many?** : 24

**Comments/Clarifications** : Several Non MDs are included

**Diversity** : International repersentatives

**How Many?** : 8

**Comments/Clarifications** : Several International participants are included

## SECTION IV - TIMELINE

Tentative timetable. Please provide a sufficiently detailed timeline to support that the necessary activities/tasks needed to complete the project will be completed within the expected timeframe (e.g., CPGs submitted for publications within 2 years; all other documents submitted within 1 year). This should include pre- and post meeting work, such as conference calls, in-person meetings, literature review, writing deadlines (outlines, first drafts, review by co-authors etc.). This section should NOT include meeting agendas. Please include a completion date for each task through submission for peer review (for document projects) or completion (for non-document projects)

**Activity/Task** : Kickoff call with ats, discussion leaders, email to participant confirming participation

**Location/Communication modality** : Preconference / Zoom

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 01/02/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 01/15/2023

**Activity/Task** : Introductory Webinar (1st webinar)

**Location/Communication modality** : Preconference (zoom)

**# of Participants** : 34

**Anticipated Started Date (MM/DD/YYYY)** : 01/15/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 01/30/2023

**Activity/Task** : Discussion between the Discussion leaders and co-chairs

**Location/Communication modality** : Preconference (zoom/E-mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 02/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 04/15/2023

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**Activity/Task** : In-person Meeting / Virtual meeting

**Location/Communication modality** : Conference

**# of Participants** : 34

**Anticipated Started Date (MM/DD/YYYY)** : 05/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 05/24/2023

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**Activity/Task** : Discussion leaders compile results and prepare summary

**Location/Communication modality** : Postconference (zoom)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 06/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 06/30/2023

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**Activity/Task** : Writing group prepares first draft based on summaries

**Location/Communication modality** : Postconference (zoom)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 07/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 08/30/2023

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**Activity/Task** : Final document preparation

**Location/Communication modality** : Postconference (zoom/E-Mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 09/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 09/30/2023

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**Activity/Task** : Distribution of document to all participants

**Location/Communication modality** : Postconference (E-Mail)

**# of Participants** : 34

**Anticipated Started Date (MM/DD/YYYY)** : 10/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 10/15/2023

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**Activity/Task** : Collection and incorporation of feedback from participants

**Location/Communication modality** : Postconference (zoom/E-Mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 11/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 11/15/2023

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**Activity/Task** : Submission of manuscript by M. Lehmann

**Location/Communication modality** : Postconference (Internet)

**# of Participants** : 1

**Anticipated Started Date (MM/DD/YYYY)** : 11/15/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 11/30/2023

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**Activity/Task** : Peer Review

**Location/Communication modality** : virtual

**# of Participants** : 3

**Anticipated Started Date (MM/DD/YYYY)** : 12/01/2023

**Anticipated Completion Date (MM/DD/YYYY)** : 12/30/2023

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**Activity/Task** : Revision 1st round

**Location/Communication modality** : Postconference (zoom/E-Mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 01/02/2024

**Anticipated Completion Date (MM/DD/YYYY)** : 01/30/2024

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**Activity/Task** : Peer review (second round)

**Location/Communication modality** : virtual

**# of Participants** : 3

**Anticipated Started Date (MM/DD/YYYY)** : 02/01/2024

**Anticipated Completion Date (MM/DD/YYYY)** : 02/28/2024

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**Activity/Task** : Revision (second round)

**Location/Communication modality** : Postconference (zoom/E-Mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 03/01/2024

**Anticipated Completion Date (MM/DD/YYYY)** : 03/30/2024

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**Activity/Task** : Approval BoD

**Location/Communication modality** : Postconference (zoom/E-Mail)

**# of Participants** : 8

**Anticipated Started Date (MM/DD/YYYY)** : 04/01/2024

**Anticipated Completion Date (MM/DD/YYYY)** : 04/30/2024

---

**Activity/Task** : Article accepted and in print

**Location/Communication modality** : virtual

**# of Participants** : 34

**Anticipated Started Date (MM/DD/YYYY)** : 05/01/2024

**Anticipated Completion Date (MM/DD/YYYY)** : 05/15/2024

## SECTION V - BUDGETS

FY2023 PROPOSED ATS BUDGET

* Round Trip Coach Airfare-Domestic ($575 per person) Number of Persons? 3

* Round Trip Coach Airfare-International ($2000 per person) Number of Persons? 1

* Hotel and per diem (Full Day Meeting at ATS Conference Fri & Sat Only) ($425 per person) Number of Persons? 33

* Breakfast Meeting at ATS Conference ($75.00 Per Person) Number of Persons? *-- empty --*

* Lunch Meeting at ATS Conference ($75.00 Per Person) Number of Persons? 33

Conference Calls (# of people x # minutes x 0.10)

* # of people 34

* # of minutes 180

* # of calls 3

* Medical Librarian - This item requires approval and justifications from document development staff (up to $5000) *-- empty --*

Other Project Expenses

☑ Not Applicable

## SECTION VI - Conflict of Interest Management

*ATS members and others participating in official ATS projects have diverse experiences and relationships that positively contribute to project development. Disclosure and consideration of potential "conflicts of interest" (COI) relationships and personal interests that could be perceived as unduly influencing a participant's generation or assessment of evidence, and thereby potentially misinforming healthcare decision makers is essential to assure that official ATS projects always reflect the best available evidence and scientific rigor. Therefore, for all proposed projects:*

- Yes, I agree to follow COI rules

## SECTION VII - Chair Acknowledgement

*Submission of application constitutes Electronic signature. Electronic Signatures are considered binding.*

## SECTION VIII - Revising Application After Reviewer Feedback

*Please do not complete until Planning Committee reviews are received.*

* Revision - Tell us what revisions have been made and how reviews from Planning Committee were addressed

We thank the reviewers and the committee for the positive feedback on our proposal. Several important points were raised that we have addressed in the resubmission. We feel this has further improved the focus of the proposal as well as ensured a diverse group of experts including both early career members as well as senior investigators. We have further clarified and streamlined discussion points and responsibilities associated to the manuscript generation ensuring the achievement of the stated objectives.

1. The scope of the proposal was determined to be quite large and we agree with this concern. We have adapted the proposal in a way that it focusses on PCLS completely and will leave out a designated alternative approach session. We will however ensure that this topic is discussed throughout all sessions as required. By integrating this topic, we remove redundancy and focus our scope. In addition, we by taking this approach, we also allow for more time for other sessions.
2. There was concern about too little discussion time for each topic. By reducing the number of topics to five instead of six, we significantly extended discussion time by 50% to 45mins per topic allowing enough time for in-depth discussion and formulation of recommendations, which are essential for this workshop.
3. We have further clarified the responsibilities for manuscript generation. The pre-Workshop meetings as well as summaries from the workshop itself will provide the basis for the manuscript. Drs Königshoff and Lehmann will be responsible for timely delivery of the manuscript according to the indicated timelines.
4. We have put additional emphasis to include a diverse group of particvipants, while maintaining international representation. We have included additional early career members and female faculty, increasing female faculty to 16 (of 33 total). One of the co-chairs is an early career member and we have actively increased active early career participation by adding one early career member next to a more senior investigator as a chair to each of the five topics. Equally, we ensured that 50% of the chairs are female. Out of 34 participants, we have further increased diversity within the participants pool (16 women, 6 URM, 11 ECP, 24 Non MDs, and 8 international participants).
5. We have now clarified the discussion points of each topics that should be discussed on in each part. Discussion points will be focused on the specific topic and the question we want to address in the report.

a. Topic 1: This topic focuses on PCLS generation, cultivation and preservation and aims to develop recommendations for standardization of procurement/ processing and optimizationb. Topic 2: PCLS disease models. Which injury/ disease models and readouts can be modeled in PCLS, what are the advantages and potential limitations, how would proof of concept studies look like. If working with

diseased tissue, adaptations to generation, cultivation and preservation are required. c. Topic 3: Which advanced readouts can we recommend for mechanistic studies in PCLS? We will focus on multi-omic approaches and advanced imaging techniques.d. Topic 4: The discussion will focus on how we can develop and measure quantitative translational readouts and relevant clinical biomarkers and especially on the standardization required for preclinical models. e. Topic 5: The discussion will focus on future directions for PCLS research such as advancement of the model system with bioreactors and genetic modifications.

6. We have now included more information on how the 1-day workshop will lead to the envisioned report. By focusing on specific discussion points we streamline the discussion and ensure meaningful results. We have further clarified responsibilities associated with the manuscript generation. Thank you again for your valuable feedback, we are very exciting about this proposal and believe this will have a great impact on ATS society members.

* Can we share your application with ATS members if it is deemed a model application by the Program Review Subcommittee (PRS)?

Yes

# ATS BUDGET SUMMARY CHART

| Line Item | Budget Parameters | Number of Persons | Total |
|---|---|---|---|
| **Round Trip Coach Airfare-Domestic** *($575 per person)* | *$575.00* | 3 | $1,725.00 |
| **Round Trip Coach Airfare-International** *($2000 per person)* | *$2,000.00* | 1 | $2,000.00 |
| **Hotel and per diem (Full Day Meeting at ATS Conference Fri & Sat Only)** *($425 per person)* | *$425.00* | 33 | $14,025.00 |
| **Breakfast Meeting at ATS Conference** *($75.00 Per Person)* | *$75.00* | | N/A |
| **Lunch Meeting at ATS Conference** ($75.00 Per Person) | *$75.00* | 33 | $2,475.00 |
| **Conference Calls** *(# of people x # minutes x 0.10)* | *34 x 180 x 0.10* = $612.00 | **(# Calls)** 3 | $1,836.00 |
| **Medical Librarian** – This item requires approval and justifications from document development staff *(up to $5000)* | N/A | N/A | N/A |
| **Other Project Expenses** – Must provide Budget justification | N/A | N/A | N/A |
| ***Note:*** *Your proposed budget may be adjusted by staff and/or PRS to comply with ATS budgetary Policies and Procedures.* | | **Total** | ***$22,061.00*** |