2024 年度 SP+ Fund 報告書（General）

Project Report: SP+ Fund 2024 (General Program)

プロジェクトの基本情報／Key Project Information	
課題名（英語） Project name (in English)	Fostering synergy in an integrated therapeutic approach to precisely control allergic immune response through strategic alliance with clinical immunologists
期間／Period	From 2024/07/01 Until 2025/03/15
主な研究分野 Main research fields	Chemical biology, Immune regulation, Epithelial cells, Nucleic acid therapeutics
活動内容 （該当するものに全て✓してください。） Activities to be funded (check ✓ all applicable items)	☑ 研究ワークショップ、会議、ラウンドテーブル、シンポジウム等の実施／Research workshops, conferences, roundtables, symposiums, etc. ☑ 共同研究や研究打合せにかかる渡航・招へい Travel/invitations for collaborative research or research meetings ☑ その他 （具体的に）／Other (please specify) (Joint Education activities)
区分／Type of collaboration	☑ Bilateral ※本学と SP 校との 2 機関で実施するプロジェクト (Project conducted by Kyoto University and one SP institution) ☐ Multilateral ※本学と SP 校に加え、さらに 1 機関以上 (Project conducted by Kyoto University, an SP institution, and one or more additional institutions)
実施場所／Location of implementation	☑ 京都大学／Kyoto University ☑ その他／Other location (University of Zurich)

申請者（京都大学）／Applicant (Kyoto University)	
姓／Family name	NAMASIVAYAM
名／Given name	Ganesh Pandian
職名／Position	Junior Associate Professor and Principal Investigator
所属部局 Faculty/dept. of affiliation	Graduate School of Engineering/Department of Molecular Engineering/Institute for Integrated Cell Material Sciences, Kyoto University Institute for Advanced Study

SP 校のプロジェクト代表者／Representative from SP institution	
姓／Family name	AKDIS
名／Given name	Cezmi
職名／Position	Director and Professor
所属大学／Institution	☐ ボルドー大学／University of Bordeaux ☐ ウィーン大学／University of Vienna

SP 校のプロジェクト代表者／Representative from SP institution	
	☑ チューリヒ大学／University of Zurich ☐ ハンブルク大学／University of Hamburg ☐ 国立台湾大学／National Taiwan University
所属部局 Faculty/dept. of affiliation	Faculty of Medicine, Swiss Institute of Allergy and Asthma Research, Christine Kühne-Center for Allergy, University of Zurich

その他のプロジェクト代表者（Multi の場合）／Representative from other collaborating institution (in the case of multilateral projects) ※	
姓／Family name	
名／Given name	
職名／Position	
所属大学／ Institution	☐ ボルドー大学／University of Bordeaux ☐ ウィーン大学／University of Vienna ☐ チューリヒ大学／University of Zurich ☐ ハンブルク大学／University of Hamburg ☐ 国立台湾大学／National Taiwan University ☐ その他／Other （機関名／name of institution:　　）
所属部局 Faculty/dept. of affiliation	

※4機関以上によるプロジェクトの場合は、必要に応じて欄を追加願います。
If the project involves four or more institutions, please insert additional fields as required.

プロジェクトの実施内容／Summary of the project

公開されている関連リンクや、フライヤー、プログラム、報告書、広報記事等の提出をもって して代えることも可能です。 This could be substituted by submitting publicly available relevant links, flyers, programs, reports, publicity articles, etc.

The exponential upsurge in allergy diseases in recent years is increased by the propagation of allergens in food, personal care products and planetary health challenges that amplify environmental allergens. Encouraged by the foundation set in FY 2023, the chemical biology team from Kyoto University (Team KU) formed a strategic alliance with the clinical immunology team from the University of Zurich (Team UZH) to overcome the existing barriers and foster a novel therapeutic strategy for allergy treatment. Team KU synthesized and shipped SMART-TFs targeting key genes associated with allergic immune response. Team UZH standardized protocols to validate the biological efficacy of SMART-TFs. Team UZH shared the results of the first version of SMART-TFs and discuss alternative targets to aid Team KU for creating advanced versions of SMART-TFs after optimization studies by measuring gene expression profiles. A joint publication got published in `Allergy` journal and three more are under preparation. Team UZH Director Prof. Cezmi visited KU for 5 days and gave a lecture for expanding his collaboration with KU faculties and the analysis center facilities. Prof. Namasivayam visited twice for meeting with Swiss government officials in February and again in March for the World Immune Regulation Meeting 2025 and disseminated results to clinical immunologists to expand the network and delivered a talk on mitochondrial immunotherapy for asthma research and space travel adaptation. After discussion, it has been decided that the Google-sponsored aging research center will be established under the umbrella of Science City Davos.

Prof. Cezmi from UZH visiting KU and interacting with the faculties to accelerate mitochondrial immunotherapy

今後の展望／Prospects for future research collaboration

- **Sustainable collaborative follow-up activities.**

⇒ In FY2024, the teams initiated closely inter-twined the links between KU and UZH with scientific and personnel exchanges. Team KU member Mr. Katsuhiko Abe visited UZH with Namasivayam Group`s JSPS Kiban B to develop SMART-Flare technology. Also, using iCeMS internship program program, Ms. Francesca Zanninelli a master course student who will be enrolled for PhD in UZH visited KU and learned the know-how of SMART-TF. Importantly, the team KU expanded the network and established a sustainable mechanism with a broader topic on allergy and asthma research with Prof. Cezmi who has a strong network as the world leader in this topic Prof. Namasivayam met the principle investigators Prof. Milena Sokolowska, Prof. Mantel Pierre-Yves. Prof. Ganesh E. Phad, Dr. Urszula Radzikowska, Dr. Yasutaka Mitamura, Dr. Yagiz Pat and Dr. Duygu Yazici and Prof. Ismail Ogulur.

⇒ Prof. Namasivayam has been approached by Google Life Sciences and Indian Government consortium on establishing a multi-national research center in combination with the recently established onsite laboratory INtelligent ChemBioInformatics (IN-CBI) to tackle age-related diseases. Prof. Cezmi kindly offered to lend support on this and moved his connections to establish Science City Davos to be the hub for this activity.

⇒ Prof. Cezmi Akdis appointed Prof. Namasivayam as`Adjunct Principal Investigator` position to closely co-ordinate with the other PIs and to explore future possibilities for common grant application, for exchange fellowships and involvement to the FY 2026 world immune regulation meeting.

- **Third party funding acquired/that may potentially be acquired.**

Epithelial barrier theory is expected to open paradigm-shifting opportunities in autoimmune, metabolic and neurodegenerative diseases, which has been in steep rise and now affecting almost two billion humans. Therefore, the continuation of this joint proof-concept study can be extended to target other diseases and our project can sustain collaborative activities. Prof. Namasivayam has already acquired JSPS Grants in Scientific Research – B on ` Development of a transcription therapy approach for skin cell rejuvenation using on-demand design artificial transcription factors` with Dr. Charlotte as Research Collaborator. The teams are now preparing for the competitive funds to ETH-Zurich-Leading House Asia consolidation grant. We also plan to apply for Bill & Mellinda Gates Foundation and Wellcome trust. The KU team will be appying for the Swiss National Foundation joint program with JSPS, cross-border grants including Strategic International Collaborative Research Program (SICORP)/ JSPS Bilateral programs, Human Frontier Science Program (HFSP), Cross-disciplinary type. Because allergic immune response is

a common phenomenon behind many communicable and non-communicable diseases, we will also try funds from industries interested in acquiring technology and patents are expected.