



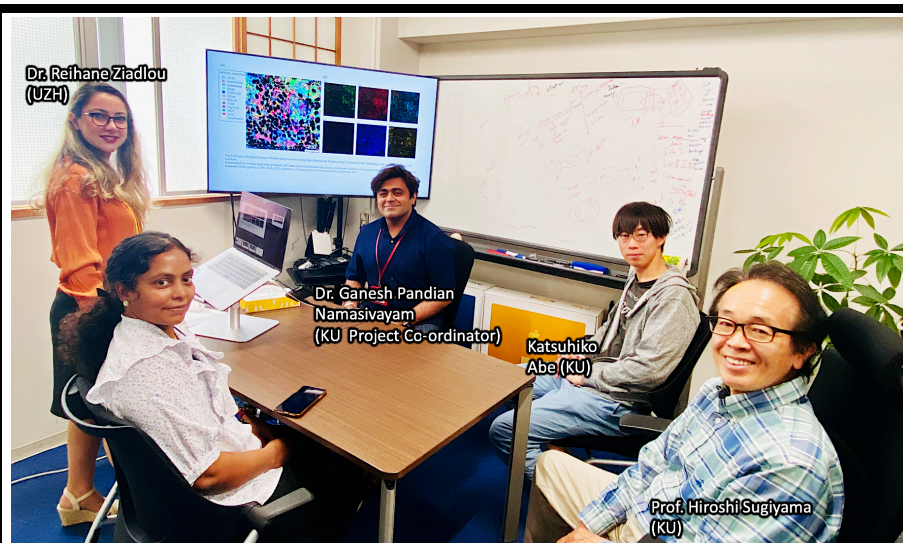
Report of UZH-KU Joint Research Project

Section 1

Project title:	Technology integration to achieve artificial regulation of white adipose tissue inflammation in obesity using SMART genetic switches
Project coordinator (KU) Name Position Faculty, department	Ganesh Pandian NAMASIVAYAM Junior Associate Professor Graduate School of Engineering/Department of Molecular Engineering/ Institute for Integrated Cell Material Sciences (iCeMS)/Kyoto/Japan
Project coordinator (UZH) Name Position Faculty, department	Marie-Charlotte Brügger Assistant Professor Department of Dermatology, University Hospital Zurich, Switzerland Faculty of Medicine, University Zurich, Zurich, Christine Kühne Foundation of Allergy Research and Education (CK CARE), Davos, Switzerland
Period of project	From: 1 April 2021 To: 31 March 2022
Project location	Zurich University and Kyoto University
No. of participants	[KU] Faculty members: Hiroshi Sugiyama, professor [UZH] Faculty members: Reihane Ziadlou, post-doc Others: *A participant list can be attached instead of completing the above section. The list should include the details above.
URL at which project outcomes can be viewed (e.g. workshop notifications/programs/reports, evidence of academic papers published or otherwise made available, etc.)	https://www.namasivayam.icems.kyoto-u.ac.jp/blank-1



Photographs with captions



Dr. Reihane Ziadlou from University of Zurich explains about Imaging Mass Cytometry to team Kyoto University.



Section 2

Summary of the project (approx. 200 words)

*KU project leaders are required to submit a summary of the project in Japanese in addition to the English summary (approx. 400 characters).

白色脂肪組織（AT）の慢性的な軽度の炎症は、メタボリックシンドローム・変形性関節症・癌などの疾患の病態メカニズムの一端を担っており、その炎症調節が課題となっている。本助成金により、京都大学（KU）とチューリッヒ大学（UZH）のチームは共同研究を遂行してきた。昨年度、KU では NF- κ B シグナル伝達経路・IL-6 などの関連する炎症反応の調整が可能な SMART 遺伝子スイッチの合成・スクリーニングを完了した。一方、UZH はヒト脂肪細胞の炎症モデルを標準化し、NF- κ B 関連の炎症への DNA ベースの遺伝子調節システムを検証している。また、JSPS 若手研究者海外挑戦プログラムにより現在 KU にいる UZH の Reihane Ziadlou 博士により、炎症モデルと脂肪由来間葉系幹細胞における SMART 遺伝子スイッチの有効性が調査されている。加えて、共著論文の作成と日本学術振興会国際助成金の申請を予定している。

Chronic, low-grade inflammation in obesity-related white adipose tissue (AT) has been recognized as a key pathomechanism underlying several other diseases such as metabolic syndrome, osteoarthritis and cancers. Therefore, there is an unmet need to develop alternative strategies to regulate AT-related inflammation. With this KU-UZH grant, the teams from Kyoto University (KU) and the University of Zurich (UZH) have synergistically mobilized the intellectual expertise from both sides to create a fruitful collaborative project. In FY2021, KU synthesized and screened smart (= Programmable DNA recognition) genetic switches capable of altering the nuclear factor kappa B (NF- κ B) signaling pathway and their associated inflammatory responses like Interleukin-6. On the other hand, UZH standardized an inflammatory model of human adipocytes to validate the DNA-based gene regulation system in controlling inflammation through NF- κ B signaling pathway. Dr. Reihane Ziadlou from UZH, who is now in KU with JSPS Young Researcher's Exchange Program hosted by the KU project leader is currently exploring the efficacy of smart genetic switches in the established inflammatory model and adipose-derived mesenchymal stem cells. The teams are also preparing the joint manuscripts and the applications for JSPS international grants and are expecting to sustain the collaborative activities.