Final report of UZH-KU fund for ECR program

Section 1

Applicant (at the time of application, i.e. supervisor of the visiting researcher or the visiting researcher themselves)	
Name	Naoki Morimoto
Job title	Associate Professor
University	Kyoto University
Affiliation	Graduate School of Science, Laboratory of Physical Anthropology

Section 2

Visiting researcher (if different from the above)	
Name	Yuma Tomizawa
Job title	PhD student
University	Kyoto University
Affiliation	Graduate School of Science, Laboratory of Physical Anthropology

Section 3

Host researcher	
Name	Christoph Zollikofer
Job title	Professor
University	University of Zurich
Affiliation	Anthropological Institute and Museum, Department of Anthropology

Section 4

Summary of the project (approx. 200 words)
*KU visiting researchers are required to submit a summary of the project in Japanese in addition to the English summary (approx. 400 characters).

Encephalization and acquisition of bipedal locomotion are hallmarks of human evolution. Bipedality with upright posture shaped the human pelvis in a specific way compared to other primates. The human pelvis is rounded and narrow, which is thought to be associated with the stability and efficiency of bipedal locomotion. The human-specific pelvic morphology results in a narrow birth canal. Additionally, the head is large already at birth to reach large brain at adult. As a result, neonatal head and maternal pelvic dimensions typically exhibit a tight fit and difficulties in childbirth in humans. It has been proposed that humans exhibit morphological covariations between the skull and pelvis to ameliorate obstructed labor. In this proposed project, we aim to test such covariation at wider and higher levels. We plan to collect the Computed Tomography (CT) data of both the pelvis and skull for wide range of primates housed at University of Zurich. The visiting researcher from Kyoto University scanned $N = 20$ individuals (skull and pelvis) of nine primate species. Additionally, he exchanged research ideas with the researchers at University of Zurich throughout his stay, which will potentially be a foundation for further collaboration. We will perform the geometric morphometric analyses using three-dimensional data derived from CT.

脳の大型化と直立二足歩行の獲得は、ヒトの本質的な生物学的特徴である。直立二足歩行への

適応により、ヒトの骨盤は丸くかつ幅が狭いという特殊な形態を有する。この特殊な形態のため、ヒトの産道は狭くなった。加えて、脳の大型化に伴い、ヒトの頭は新生児段階から大きい。狭い産道と大きな頭の新生児という組み合わせにより、ヒトは難産である。ヒトでは、難産を緩和するメカニズムとして、骨盤と頭蓋骨の形態が互いに対応する共変動を示すという仮説が近年提唱された。本研究では、霊長類における骨盤と頭蓋骨の共変動を更に詳細に調査することを目的とする。このために、スイス・チューリッヒ大学に所蔵されている霊長類標本の骨盤と頭蓋骨をコンピューター断層装置（CT）を用いて撮像することを計画した。京都大学の渡航研究者は 9 種 20 個体分の霊長類標本を撮像した。さらに、チューリッヒ大学の若手研究者とも期間を通じて交流し、今後の共同研究発展の礎となったと考える。今後、三次元形態測定の手法を用いてデータを分析する。