

**Marlen Kücklich<sup>1</sup>, Susann Jänig<sup>1</sup>, Claudia Birkemeyer<sup>2</sup>, Anja Widdig<sup>1,3</sup>**

<sup>1</sup> Institute of Biology, University of Leipzig, Leipzig, GER

<sup>2</sup> Institute of Analytical Chemistry, University of Leipzig, Leipzig, GER

<sup>3</sup> Junior Research Group of Primate Kin Selection, Department of Primatology, Max-Planck-Institute for Evolutionary Anthropology, Leipzig, GER

Correspondence: marlen-k@gmx.net

## **Difference in olfactory profiles across female cycle stages in chimpanzees**

Primates are considered to be microsmatic, i.e. have a poor sense of smell. However, recent studies showed that olfaction seems to be important for several primate species in various behavioural contexts. Observations on male chimpanzees (*Pan troglodytes*) investigating female genitals suggest that olfactory cues might be indicative of menstrual cycle phases. Accordingly, the current study investigated whether there are differences between olfactory profiles of female chimpanzees depending on their menstrual cycle. Body odour samples including (semi-)volatiles were collected from six females at the Zoo Leipzig and analysed using gas chromatography-mass spectrometry. Considering whole body odour profiles, we found no difference in relation to cycle phases. However, based on 37 odour profiles, 64 substances were identified with ten substances classified as endogenous (i.e., likely to derive from animal itself as they were previously found in mammals). Three of these substances (acetic, dodecanoic and succinic acid) were specific for only one cycle phase. Interestingly, they were previously found in body and vaginal odour of women and chimpanzees. Two further substances (9-octadecanamide, 19-norcholesta-1,3,5(10)-trien-6-one) showed perspicuous variances of their proportions between cycle phases. Notably, all five substances occurred right before or during the potential time of ovulation. In conclusion, we detected no quantitative but qualitative differences in odour profiles from different cycle phases, which could provide olfactory information about the females' reproductive status. In the light of these results, methodological aspects and potentially communicative functions will be discussed.