

SEEWIESEN

LECTURE SERIES

FALL/WINTER 2018/19

Max Planck Institute
for Ornithology

MAX-PLANCK-GESELLSCHAFT

THURSDAY | January 17th, 2019 | 13.30 | HOUSE 4 LECTURE ROOM

SHAORYUAN WU

Jiangsu Normal University | Host: Küpper Research Group

Reconstructing the Mammalian Tree of Life in the Era of Genomics

Despite significant recent progress in understanding mammalian evolution, the relationships among the various orders of placental mammals and the timing of their diversification in the geological past are still debated. We use a large dataset, containing genome-scale DNA sequences from representatives of all placental orders, to construct a well-supported mammalian phylogeny based on techniques that circumvent key biases rooted in properties of genomic data. Our results provide a resolution to some controversial questions about mammalian phylogeny, for example by showing that flying lemurs are closely related to primates. By utilizing our new phylogenetic tree in combination with 21 well-dated fossils that allow calibration of evolutionary rates, we infer that the radiation of placental orders occurred in a rapid episode spanning the Cretaceous-Paleogene (KPg) boundary. We therefore propose a new hypothesis, the trans-KPg burst model of placental diversification, which matches the mammalian fossil record more closely than previous “molecular clock” reconstructions.

WHO IS SHAORYUAN WU?

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| 1993 | BS, Hunan Agricultural University, China |
| 2002 | MS, Chinese Academy of Sciences, China |
| 2011 | PhD, Harvard University, USA |
| 2011 | Visiting Professor, Shenyang Normal University, China |
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SELECTED PUBLICATIONS

- Yang S, Liu L, Cao C, Song N, Wang Y, Ma S, Zhang Q, Yu N, Ding X, Yang F, Tian S, Zhang K, Sun T, Yang J, Yao Z, Wu S, Shi L. (2018) USP52 acts as a deubiquitinase and promotes histone chaperone ASF1A stabilization. *Nature Communications* 9: 1285.
- Liu L, Zhang J, Rheindt FE, Lei F, Qu Y, Wang Y, Sullivan C, Nie W, Wang J, Yang F, Chen J, Edwards SV, Meng J, Wu S (2017) Genomic evidence reveals a radiation of placental mammals uninterrupted by the KPg boundary. *Proc. Natl. Acad. Sci. USA* 114: E7282-7290. –Highlighted by *Nature* (2017, vol. 548, no. 7668), and recommended by F1000Prime (DOI: 10.3410/f.728639209.793535590).
- Low GW, Chattopadhyay B, Garg KM, Irestedt M, Ericson PGP, Yap G, Tang Q, Wu S, Rheindt FE. (2017) Urban landscape genomics identifies fine-scale gene flow patterns in an avian invasive. *Heredity* 120: 138-153.
- Liu L, Xi Z, Wu S, Davis C, Edwards SV (2015) Estimating phylogenetic trees from genome-scale data. *Annals of the New York Academy Sciences* 1360 (2015): 36-53.
- Wu S*, Zhang F, Edwards SV, Wu W, Ye J, Bi S, Ni X, Quan C, Meng J, Organ CL (2014) The evolution of bipedalism in jerboas (Rodentia: Dipodoidea): Origin in humid and forested environments. *Evolution* 68 (7): 2108-2118.
- Zhou C-F, Wu S, Martin T, Luo Z-X (2013) A Jurassic mammaliaform and the earliest mammalian evolutionary adaptations. *Nature* 500 (7461): 163-167.
- Song S, Liu L, Edwards SV, Wu S (2012) Resolving conflict in eutherian mammal phylogeny using phylogenomics and the multispecies coalescent model. *Proc. Natl. Acad. Sci. USA* 109 (37): 14942-14947.

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