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Review article

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Human-specific genetics: new tools to explore the molecular and cellular basis of human evolution

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Supplementary table S1: A list of non-human great ape and primate PSC lines established

Year	Study	Species	Number of PSC lines	References
2013	Marchetto et al.	*Pan troglodytes*	2	[1]
2014	Fujie et al.	*Pan troglodytes*	2	[2]
2015	Romero et al.	*Pan troglodytes*	7	[3]
2016	Mora Bermudez et al.	*Pan troglodytes*	1	[4]
2017	Hemmi et al.	*Pan troglodytes*	1	[5]
2018	Pavlovic et al.	*Pan troglodytes*	2	[6]
2019	Pollen et al.	*Pan troglodytes*	4	[7]
2019	Kanton et al.	*Pan troglodytes*	1	[8]
2019	Field et al.	*Pan troglodytes*	1	[9]
2014	Wunderlich	*Pan paniscus*	1	[10]
2019	Kanton et al.	*Pan paniscus*	1	[8]
2013	Navara et al.	*Papio anubis*	2	[11]
2015	Ramaswamy et al.	*Pongo abelii*	2	[12]
2016	Mora Bermudez et al.	*Pongo abelii*	1	[4]
2019	Field et al.	*Pongo abelii*	1	[9]
2021	Geuder et al.	*Pongo abelii*	2	[13]
2014	Wunderlich et al.	*Gorilla gorilla*	1	[10]
2021	Benito-Kwiecinski et al.	*Gorilla gorilla*	1	[14]
2021	Geuder et al.	*Gorilla gorilla*	1	[13]
1995	Thomson et al.	*Macaca mulatta*	1	[15]
2006	Mitalipov et al.	*Macaca mulatta*	18	[16]

2001	Suemori et al	*Macaca fascicularis*	4	[17]
2012	Wunderlich et al.	*Macaca fascicularis*	3	[18]
2014	Wunderlich	*Macaca fascicularis*	1	[10]
2016	Otani et al.	*Macaca fascicularis*	2	[19]
2016	Otani et al.	*Macaca nemestrina*	1	[19]
2011	Ben-Nun et al.	*Mandrillus leucophaeus*	1	[20]
2017	Hemmi et al.	*Callithrix jacchus*	4	[5]
2020	Chung et al.	*Chlorocebus sabaeus*	11	[21]

PSC, pluripotent stem cell

Supplementary References

1. Marchetto, M. C. N. *et al.* Differential L1 regulation in pluripotent stem cells of humans and apes. *Nature* **503**, 525–529 (2013).
2. Fujie, Y. *et al.* New type of Sendai virus vector provides transgene-free iPS cells derived from chimpanzee blood. *PLoS One* **9**, e113052 (2014).
3. Gallego Romero, I. *et al.* A panel of induced pluripotent stem cells from chimpanzees: a resource for comparative functional genomics. *Elife* **4**, e07103 (2015).
4. Mora-Bermúdez, F. *et al.* Differences and similarities between human and chimpanzee neural progenitors during cerebral cortex development. *Elife* **5**, (2016).
5. Hemmi, J. J., Mishra, A. & Hornsby, P. J. Overcoming barriers to reprogramming and differentiation in nonhuman primate induced pluripotent stem cells. *Primate Biol* **4**, 153–162 (2017).
6. Pavlovic, B. J., Blake, L. E., Roux, J., Chavarria, C. & Gilad, Y. A Comparative Assessment

of Human and Chimpanzee iPSC-derived Cardiomyocytes with Primary Heart Tissues. *Sci. Rep.* **8**, 15312 (2018).

7. Pollen, A. A. *et al.* Establishing Cerebral Organoids as Models of Human-Specific Brain Evolution. *Cell* **176**, 743–756.e17 (2019).
8. Kanton, S. *et al.* Organoid single-cell genomic atlas uncovers human-specific features of brain development. *Nature* **574**, 418–422 (2019).
9. Field, A. R. *et al.* Structurally Conserved Primate LncRNAs Are Transiently Expressed during Human Cortical Differentiation and Influence Cell-Type-Specific Genes. *Stem Cell Reports* **12**, 245–257 (2019).
10. Wunderlich, S. *et al.* Primate iPS cells as tools for evolutionary analyses. *Stem Cell Res.* **12**, 622–629 (2014).
11. Navara, C. S. *et al.* Derivation of induced pluripotent stem cells from the baboon: a nonhuman primate model for preclinical testing of stem cell therapies. *Cell. Reprogram.* **15**, 495–502 (2013).
12. Ramaswamy, K. *et al.* Derivation of induced pluripotent stem cells from orangutan skin fibroblasts. *BMC Res. Notes* **8**, 577 (2015).
13. Geuder, J. *et al.* A non-invasive method to generate induced pluripotent stem cells from primate urine. *Sci. Rep.* **11**, 3516 (2021).
14. Benito-Kwiecinski, S. *et al.* An early cell shape transition drives evolutionary expansion of the human forebrain. *Cell* **184**, 2084–2102.e19 (2021).
15. Thomson, J. A. *et al.* Isolation of a primate embryonic stem cell line. *Proc. Natl. Acad. Sci. U. S. A.* **92**, 7844–7848 (1995).
16. Mitalipov, S. *et al.* Isolation and characterization of novel rhesus monkey embryonic stem cell lines. *Stem Cells* **24**, 2177–2186 (2006).
17. Suemori, H. *et al.* Establishment of embryonic stem cell lines from cynomolgus monkey blastocysts produced by IVF or ICSI. *Dev. Dyn.* **222**, 273–279 (2001).

18. Wunderlich, S. *et al.* Induction of pluripotent stem cells from a cynomolgus monkey using a polycistronic simian immunodeficiency virus-based vector, differentiation toward functional cardiomyocytes, and generation of stably expressing reporter lines. *Cell. Reprogram.* **14**, 471–484 (2012).
19. Otani, T., Marchetto, M. C., Gage, F. H., Simons, B. D. & Livesey, F. J. 2D and 3D Stem Cell Models of Primate Cortical Development Identify Species-Specific Differences in Progenitor Behavior Contributing to Brain Size. *Cell Stem Cell* **18**, 467–480 (2016).
20. Ben-Nun, I. F. *et al.* Induced pluripotent stem cells from highly endangered species. *Nat. Methods* **8**, 829–831 (2011).
21. Chung, Y. G., Seay, M., Elsworth, J. D. & Redmond, D. E. Generation of Pluripotent Stem Cells Using Somatic Cell Nuclear Transfer and Induced Pluripotent Somatic Cells from African Green Monkeys. *Stem Cells Dev.* **29**, 1294–1307 (2020).