

## Supplemental material 1 – Large domestic ruminants

Table describing isolation and characterization of iPSC from large domestic ruminants.

| Author/year     | Animal  | Cell type                                      | Repg. System   | Supplementation  | Days until colony                                       | Differentiation   | Reprogramming efficiency                | Immunocytochemistry  | Gene expression (endogenous)  | Gene expression (exogenous)         |
|-----------------|---------|--|--|--|---|---|---|--|---|-------------------------------------|
| Sumer, 2011     | Bovine  | Adult ear fibroblast                           | Retrovirus, hOSKM+ NANOG                                     | LIF+ bovine bFGF   | 7-14 days   | EB+ teratomas   | 0.000118%                               | OCT4, SSEA1  | ALP1, REX1, OCT4, SOX2, NANOG, c-MYC, KLF4  | OCT4, SOX2, NANOG, KLF4, C-MYC      |
| Han, 2011       | Bovine  | Embryonic fibroblast                           | Retrovirus PMXs - bovine OCT4, SOX2, KLF4, MYC, LIN28, NANOG | LIF+ bFGF or bFGF (optimal)  | +21 days  | EB+ teratomas   | 0 - approx. 0.006%                      | SSEA1, NANOG, SOX2, weak for SSEA4, negative for TRA-1-60, TRA-1-81. | OCT4, SOX2, not NANOG   | OCT4, SOX2, KLF4, MYC, LIN28, NANOG |
| Cao, 2012       | Bovine  | Fetal fibroblast (2.5-4m)                      | Lentivirus, hOCT4, pig Sox2, c-Myc, Klf4+GFP                 | LIF+bFGF   | -   | EB+teratoma+ induced differentiation into female germ cells | 0.0002-0.0007%                          | OCT4, NANOG, SSEA1. NEGATIVE FOR SSEA3, SSEA4, TRA-1-60, TRA-1-81.   | OCT4, KLF4, NANOG   | OCT4, KLF4                          |
| Deng, 2012      | Buffalo | Fetal fibroblasts                              | Retrovirus pMX, buffalo OSKM+NANOG+LIN28                     | bFGF+LIF   | 11-14 days  | EB+Teratoma   | -                                       | AP, Oct4, Sox2, Nanog, SSEA-1, SSEA-4, TRA-1-81, and E-Cadherin      | Oct4, Sox2, Nanog, STAT3, GP130, FOXD3, E-Cadherin, bFGF2, p53  | Silenced in some cell lines         |
| Wang, 2013      | Bovine  | Calf testicular cells                          | Electroporation of OCT4                                      | LIF+BMP4   | 17 days   | Induced differentiation and teratoma                        | 0.3%                                    | OCT4, NANOG, SOX2, SSEA-1, SSEA-4                                    | OCT4, SOX2, MYC, KLF-4, MEF2a, SUZ12, STAT3, DNMT1  | -                                   |
| Kawaguchi, 2015 | Bovine  | Amniotic cells from a 50d gestation            | PiggyBac Dox inducible transposon OSKM                       | Bovine LIF+FGF2 or bLIF, Mek/Erk inhibitor, GSK3 inhibitor and forskolin | 8 days (primary colonies), 14 days (flattened colonies) | EB EB+ chimera  | 0.01%                                   | OCT4, NANOG  | OCT4, SOX2, NANOG, CDH1, REX1, ESRRB, STELLA, LIFR, SOCS3. FGF5 AND OTX2 ONLY IN PRIMED IPSCS.        | OCT4-KLF, c-MYC                     |
| Talluri, 2015   | Bovine  | Fetal fibroblast                               | PiggyBac transposon - human OSKMNL                           | LIF+bFGF   | 14-17 days  | EB+ teratoma  |   | OCT4, SSEA1, SSEA3, WEAK FOR SSEA4                                   | OCT4, SOX2, c-MYC, KLF4, NANOG, REX1, ALP, CDH1, STAT3. SALL, DPPA, SOCS.negative for Brachyuri, FGF5 | -                                   |
| Cravero, 2015   | Bovine  | Mamary epithelial cells and dermal fibroblasts | Retrovirus pMX, murine leukemia virus, mOSKM                 | LIF + bFGF   | 12 and 15 days  | Teratoma, Partial differentiation into mammary cells        | 0.11 and 0,09%                          | OCT4, LIN28  | OCT4, SOX2, NANOG, LIN28, REX1, C-MYC, KLF4   | -                                   |
| Bai, 2016       | Bovine  | Retinal neural stem cells                      | Lentivirus, bovine miR302/367                                | Valproic acid, with or without melatonin                                 | 4 days  | Teratoma  | Control: 19,24% Melatonin group: 41,25% | OCT4, NANOG  | OCT4, SOX2, NANOG, miR-302a, miR302b,   | -                                   |

|             |        |                      |                                 |             |         |              |              |                                 |   |   |
|-------------|--------|----------------------|---------------------------------|-------------|---------|--------------|--------------|---------------------------------|---|---|
| Zhao, 2017  | Bovine | Fetal fibroblast     | PiggyBac transposon bovine OSKM | LIF+bFGF    | 8 days  | EB+ teratoma | -            | OCT4, SOX2, SSEA3, SSEA4, CDH-1 | miR302c, miR302d miR-367<br>OCT4 (weak), NANOG, SOX2, C-MYC, KLF4 | - |
| Canizo 2018 | Bovine | Embryonic fibroblast | Lentivirus                      | SB43 medium | 16 days | Non-assessed | Non-assessed | Non-assessed                    | Non-assessed  | - |

iPSC: induced pluripotent stem cells; hOSKM: human Oct4, Sox2, KLF4, c-Myc; LIF: leukemia inhibitor factor; bFGF: basic fibroblast growth factor; EB: embryoid body; OCT4: octamer-binding transcription factor 4; SSEA-1: stage-specific embryonic antigen-1; AP: alkaline phosphatase; REX-1: ZFP-42; SOX2: Sex determining region Y-box 2; KLF4: Kruppel-like factor 4; c-MYC: MYC Proto-Oncogene; PMX: Moloney murine leukemia virus (MMLV); LIN28: Lin-28 Homolog A; NANOG: Nanog Homeobox; SSEA-4: stage-specific embryonic antigen-4; TRA-1-60: T cell receptor alpha locus; TRA-1-81: PODXL; GFP: green fluorescent protein; BMP4: Bone Morphogenetic Protein 4; MEF2a: Myocyte Enhancer Factor A; SUZ12: Polycomb Repressive Complex 2 Subunit; STAT3: Signal Transducer And Activator Of Transcription 3; DNMT1: DNA Methyltransferase 1; CDH1: Cadherin 1; ESRRB: Steroid hormone receptor ERR2; STELLA: Dppa3 or PGC7; LIFR: Leukemia Inhibitory Factor Receptor Alpha; SOCS3: Suppressor of cytokine signaling 3; FGF5: Fibroblast Growth Factor 5; miR: microRNA; GP130: Interleukin 6 Signal Transducer; FOXD3: Forkhead Box D3; P53: Tumor Protein P53.

## Supplemental material 2 – Small domestic ruminants

Table describing isolation and characterization of iPSC from small domestic ruminants.

| Year | Animal | Cell type  | Repg. System  | Supplementation                                    | Days until colony | Differentiation   | Reprogramming efficiency             | Immunocytochemistry  | Gene expression (endogenous)                              | Gene expression (exogenous)  |
|------|--------|--|---|--|-------------------|---|--------------------------------------|--|---|--|
| 2011 | Ovine  | Ear fibroblast (4w)                                | Lentiviral, Dox-inducible hOSKMNL +SV40 large t + hTERT | -  | 20 days           | EB+teratoma   | 0,00041                              | OCT4, SOX2, NANOG, SSEA1, TRA-1-60, TRA-1-81, REX1, CDH1. Negative for SSEA3, SSEA4. | OCT4, SOX2, NANOG, TDGF1, ERAS, DNMT3B, DAX1, DPPA4, GDF3 | Dox dependent  |
| 2011 | Goat   | Ear fibroblast                                     | Lentiviral, OSKM+ LIN28+ NANOG+ SV40 large t + hTERT    | LIF+bFGF+eFGF                                      | 7 days            | EB+teratoma   | -                                    | SSEA1, TRA-1-60, TRA-1-81, REX1, CDH1. Negative for SSEA3 E SSEA4.                   | OCT4, SOX2, NANOG, TDGF, REX1, DNMT3b, DAX1, CDH1         | Dox dependent  |
| 2011 | Ovine  | Fetal fibroblast (40d)                             | Lentivirus Tet-on-inducible, mOSKM                      | hFGF2  | +14 days          | EB+teratoma   | -                                    | OCT4, SOX2, NANOG, SSEA4. Negative for SSEA1, SSEA3, TRA-1-60, TRA-1-81              | SOX2, NANOG   | OCT4, SOX2, C-MYC, KLF4  |
| 2012 | Ovine  | Embryonic fibroblasts (30d)                        | Retrovirus, pMXs -mOSKM                                 | bFGF   | 8 days            | EB+ teratoma+ chimera   | -                                    | NANOG. Negative for SSEA1 AND SSEA4.   |   | Silencing of SOX2, C-MYC and/or KLF4 at passage 10. Most lines at passage 10 but residual expression of OCT4 |
| 2012 | Ovine  | Fetal fibroblasts (33,5d)                          | Retrovirus, pMX human OSKM                              | bFGF + LIF   | <15 days          | EB+teratoma + contribution to blastocysts                                     | 0,001875%                            | OCT4, NANOG  | OCT4, SOX2  | Silenced at p17  |
| 2013 | Goat   | Fetal ear fibroblasts                              | Lentivirus, hOSKM                                       | bFGF   | 6-7 days          | EB+ teratoma  | -                                    | OCT4, NANOG  | OCT4, SOX2, C-MYC, low NANOG and KLF4.                    | Silenced at passage 10   |
| 2015 | Goat   | Embryonic fibroblasts (60d)                        | Lentivirus, hOSKM OR PRMT5+OSKM                         | bFGF+LIF+ N2+B27+ascorbic acid+ PD99023+ CHIR99021 | 7 days            | EB+ spontaneous differentiation   | -                                    | SSEA1, SSEA4, C-MYC, OCT4  |   |  |
| 2015 | Goat   | Fetal fibroblast (40d)                             | Tet-on-inducible lentivirus, mOSKM                      | LIF, LIF+VC, LIF+VPA+LIF, LIF+VC+VPA+LiCl          | 7 days            | EB+teratoma   | 0,00009-0,00045%                     | OCT4, SOX2, NANOG, SSEA1, TRA-1-60, TRA-1-81. Negative for SSEA3, SSEA4              | OCT4, SOX2, NANOG, KLF4, LIN28, REX1, PODXL, DNMT3B       | Dox-inducible  |
| 2015 | Ovine  | Fetal fibroblasts                                  | Retrovirus, pMXs, mOSKM                                 | bFGF   |                   | EB+cloned blastocysts   | -                                    | OCT4, FGFR2. Negative for NANOG, GATA3, CDX2   | SOX2, OCT4, COL1A1.                                       | OCT4, SOX2, C-MYC, KLF4  |
| 2015 | Goat   | Fetal fibroblasts                                  | Pseudovirus, bovine OKSMNL + MIR302/367                 | LIF+2i or bFGF or bFGF in SNL feeders              |                   | spontaneous differentiation (extra-embryonic and neuronal lineages) +teratoma | -                                    | OCT4, SOX2, NANOG  | OCT4, SOX2, KLF4  | NANOG was silenced at passage 10. OCT4 was expressed in most lineages  |
| 2016 | Goat   | Transgenic - lactoferrin and normal ear fibroblast | Lentivirus, hOSKM                                       | bFGF   | 6-7 days          | EB+teratoma + cloned cleaved embryos  | 0,000276 (tg) and 0,000988% (non tg) | OCT4, NANOG, AKP   | NANOG, OCT4, SOX2, MYC                                    |  |
| 2017 | Goat   | Embryonic fibroblasts                              | Exogenous mRNA OSKM                                     | FGF2   | 15 days           | EB+ spontaneous differentiation   | -                                    | OCT4, SOX2, KLF4, C-MYC, NANOG, REX1, SSEA-1, TRA-1-60, TRA-1-81.                    | OCT4, SOX2, NANOG, DAX1, GDF3                             | Non applicable   |

iPSC: induced pluripotent stem cells; hOSKMNL: human Oct4, Sox2, KLF4, c-Myc, Nanog, Lin28; SV40: Simian virus 40; hTERT: Telomerase Reverse Transcriptase; EB: embryoid body; OCT4: octamer-binding transcription factor 4; SSEA-1: stage-specific embryonic antigen-1; AP: alkaline phosphatase; REX-1: ZFP-42 (Zinc Finger Protein 42 Homolog); SOX2: Sex determining region Y-box 2; KLF4: Kruppel-like factor 4; c-MYC: MYC Proto-Oncogene; SSEA-1: stage-specific embryonic antigen-1; TRA-1-60: T cell receptor alpha locus; TRA-1-81: PODXL; CDH1: Cadherin 1; SSEA-3: stage-specific embryonic antigen-3; SSEA-4: stage-specific embryonic antigen-4; TGDF1: Teratocarcinoma-Derived Growth Factor 1; ERAS: GTPase ERas; DMNT3B: DNA Methyltransferase 3 Beta; DAX1: dosage-sensitive sex reversal, adrenal hypoplasia critical region, on chromosome X, gene 1; DPPA4: Developmental Pluripotency Associated 4; GDF3: Growth Differentiation Factor 3; OSKM: Oct4, Sox2, KLF4, c-Myc; LIF: leukemia inhibitor factor; bFGF: basic fibroblast growth factor; eFGF: epidermal growth factor; m OSKM: mouse Oct4, Sox2, KLF4, c-Myc; LIN28: Lin-28 Homolog A; NANOG: Nanog Homeobox; PMX: Moloney murine leukemia virus (MMLV); PMRT5: Protein Arginine Methyltransferase 5; B-27: neuronal cell culture supplement; N2: chemically-defined, serum-free supplement based on Bottenstein's N-1 formulation; PD99023: Piperonyl butoxide; VC: vitamin C; LiCl: Lithium chloride; CHIR99021: GSK3 inhibitor; VPA: Valproic acid; GATA3: GATA Binding Protein 3; SNL: feeder cells from the STO cell line, transformed with neomycin resistance and LIF genes; FGF2: Fibroblast Growth Factor 2; COL1A1: Collagen Type I Alpha 1 Chain; CDX2: Caudal Type Homeobox 2; 2i: PD 0325901 (MEK inhibitor) and CHIR 99021 (GSK3 inhibitor); GDF3: Growth Differentiation Factor 3; miRNA: microRNA.

Supplemental material 3 – Swine

Table describing isolation and characterization of iPSC from swine.

| Year                  | Animal | Cell type   | Repg. System   | Supplementation  | Days until colony          | Differentiation   | Reprogramming efficiency | Immunocytochemistry   | Gene expression (endogenous)           | Gene expression (exogenous)                               |
|-----------------------|--------|---|--|--|----------------------------|---|--------------------------|---|--|---|
| 2009                  | Pig    | Embryonic fibroblast                                | Retrovirus pMX, mOSKM or hOSKM   | bFGF   | 8-10 days                  | Teratoma  | -                        | AP, SSEA4 (weak), NANOG, REX1                                       | endoSOX2, NANOG, Lin28                 | Present   |
| 2009                  | Pig    | Fetal fibroblast                                    | Lentivirus, hOSKM  | bFGF, 5-AZA  | 22 days                    | EB+teratoma   | -                        | AP, SSEA1, OCT4, NANOG, SOX2  | OCT4, NANOG, SOX2, TDGF1, TERT         | Present   |
| 2009                  | Pig    | Primary ear fibroblast<br>Primary bone marrow cells | Lentivirus, human OCT4, SOX2, KLF4, MYC + LIN28, NANOG (or not) + rtTA |  | 7 days                     | EB+teratoma   | -                        | AP, SSEA3, SSEA4, TRA-1-60 TRA-81, CDH1, NANOG, REX                 | OCT4, SOX2, NANOG, DNMT3b, LIN28, CDH1 | Not applicable  |
| 2010                  | Pig    | Bone marrow MSCs                                    | Lentivirus, hOSKM + Lin28 + Nanog                                      | bFGF   | 7 days                     | EB+ chimeric embryos and piglets, contribution to embryo and placenta | -                        | AP, OCT4, SOX2  | OCT4                                   | Not silenced - expression of human OCT4                   |
| 2010                  | Pig    | Fetal fibroblast                                    | episomal Human OSKM+Nanog + Lin-28 + mouse c-Myc                       | LIF-based 2i medium 1uM VPA<br>2d of 5-aza after reprogramming | First passage at day 30    | teratoma  | -                        | AP, OCT4, SSEA1, SSEA4, pSTAT3                                      | OCT4, SOX2, NANOG                      | Evidence of integration or persistence of episomal vector |
| 2011 <sup>[167]</sup> | Pig    | Embryonic fibroblast                                | Retrovirus pMX, hOSKM  | bFGF   | 10-14 days                 | EB+ teratoma  | -                        | OCT4, SOX2, SSEA3, SSEA4, TRA-1-60                                  | LIN28, SOX2, NANOG                     | Present   |
| 2011                  | Pig    | Adult fibroblast (ear)                              | Retrovirus, pMX hOSKM + GFP or pCAG-OSKM-GFP                           | bFGF+LIF   | 9 days (retrovirus) 7 days | EB, in vitro induced differentiation (cardiomyocyte like) + Teratoma  | -                        | AP, NANOG, TRA-1-60, SSEA4  | -                                      | Plasmid integration was confirmed. Not silence            |
| 2012 <sup>[168]</sup> | Pig    | Adult fibroblast (ear)                              | Retrovirus, pMX mSKM + orange or OSKM+GFP                              | bFGF+LIF   | 8 days                     | EB, in vitro induced differentiation + Teratoma                       | -                        | AP, SSEA4, TRA-1-60, TRA-1-81, NANOG for SKM; SSEA3, NANOG for OKSM | OCT4, SOX2                             | Present   |
| 2012                  | Pig    | Embryonic fibroblasts                               | retrovirus - mouse pMXs-OSKM   | LIF or bFGF  | -                          | teratoma  | -                        | LIF or bFGF: AP<br>LIF: OCT4, NANOG, SSEA1, SSEA4.                  | OCT4, NANOG, SOX2, KLF4, KLF5          | Present   |

|                       |          |  |   |                                    |            |  |   |  |   |   |
|-----------------------|----------|--|---|------------------------------------|------------|--|---|--|---|---|
| guez, 2012            | Pig      | Fetal fibroblasts  | FUW-tETO hOSKM  | LIF then LIF+2i or LIF+3i          | 6-7 days   | EB   | -   | AP, OCT4, NANOG, Some colonies SSEA1   | OCT4, NANOG, SOX2, KLF4, NODAL, FGF5, SOME COLONIES: STELLA, REX1 | Present   |
| 2012 <sup>[169]</sup> | Mini pig | Primary embryonic fibroblast   | Tet-on hOSKM + nanogP8  | bFGF                               | 7 days     | EB   | -   | OCT4, NANOG, SOX2 (early passages), KLF4 (mosaic), c-MYC (one line). SSEA3, SSEA4 varied                                 | varied between lines  | Silenced at p10 (2 cell line)<br>Silenced at >p20   |
| g, 2012               | Pig      | Embryonic fibroblasts  | Retrovirus - pbxs mouse OSKM  | bFGF, LIF + bFGF or LIF + bFGF+VPA | 6-8 days   | EB +teratoma+ chimeric blastocyst  | bFGF 0,12%<br>bFGF+LIF 0,77%<br>bFGF+LIF+VPA 2,7% | AP, NANOG, SSEA1, -4, TRA_1-60, TRA-1-81   | OCT4, SOX2, NANOG, TERT   | Downregulated after p30<br>not silenced   |
| 2012 <sup>[170]</sup> | Pig      | Embryonic mesenchymal stem cell  | Retrovirus - pMX porcine KLF4 and OCT4  | LIF, 5i                            | 16-20 days | EB   | -   | OCT4, SSEA1, Nanog Weak or negative SSEA4, TRA-1-81  | -   | Silenced  |
| 2013 <sup>[171]</sup> | Pig      | Embryonic fibroblast   | mouse pCX-OKS-2A, pCX-cMyc (episomes)   | bFGF + SCF                         | 2-3 weeks  | EB   | -   | AP, Oct4, Sox2, Nanog, SSEA4, TRA-1-60, TRA-1-81   | OCT4, SOX2, NANOG, TDGF1, REX1, bFGF, FGFR1, FGFR2, AA, Nodal     | Silenced, integration deter   |
| iro, 2013             | Pig      | Embryonic fibroblast   | retrovirus, hOSKM   | pLIF + forskolin                   | 2 weeks    | Teratoma + chimera (Contribution to ICM and TE in embryos and contribution in fetuses) | -   | AP, STAT3, OCT4, NANOG, SSEA1, 3, CDH-1, ERAS, Low levels or negative for SSEA4, TRA-1-60 and -81                        |   | Not silenced  |
| 2013                  | Pig      | OCT4-GFP fetal fibroblasts   | ElestoporationSleeping beauty transposon - mOSKM                              | bFGF                               | 10-14 days | Teratoma + In vitro differentiation into neural lineage                                | -   | OCT4, NANOG. Heterogenous SSEA1 and TRA-1-60   | OCT4, SOX2, UTF1, SALL4, ESSRB, REX1, DPPA5, TERT. TEM            | Silenced  |
| 13                    | Pig      | Newborn ear fibroblasts, bone marrow cells, embryonic fibroblasts, adult fibroblasts | Retrovirus human OSKM, mouse OSKM, porcine OSKM, monkey OSKM or porcine OSKMN |                                    |            | Teratomas differed between lines   | -   | AP, OCT4 expression and NANOG expression. SSEA1, SSEA23/4, TRA-1-60 and TRA1-1-81 showed different results between lines | Nanog, Sox2,KLF4  | fetal fibroblast, LIF) showed silencing and then re-activation of exogenous factors. Cell lines (68 and 102) (mouse OSKM, bFGF+LIF+2i) showed silencing |
| , 2013                | Mini pig | Ear fibroblasts  | Lentivirus human OSKMNL   | LIF + bFGF                         |            | EB+ teratoma   | -   | AP, OCT4, NANOG, SSEA1   |   | Silenced  |

|                       |     |                                      |  |   |                                    |   |                                |  |   |  |
|-----------------------|-----|--------------------------------------|--|---|------------------------------------|---|--------------------------------|--|---|--|
| 2016 <sup>[172]</sup> | Pig | Fetal fibroblasts                    | Lentiviral Tet-On human OSKM   | LIF, and after establishment: LIF, LIF+2i or bFGF | 2 weeks                            | EB  | -                              | AP, OCT4, SOX2, SSEA1 and SSEA4 varied regarding supplementation | OCT4, SOX2, KLF4, NANOG, REX1, CDH1, EpCAM, OCLN  | Not applicable   |
| v, 2016               | Pig | OCT4-GFP fetal fibroblasts           | Sleeping beauty transposon - porcine OSKM+porcine NANOG+human LIN28  | SAHA, VPA, NaB, AA or LIF and AA                  | 12 days                            | Contribution to embryo development, immature teratoma                 | -                              | AP, SSEA1  | OCT4, SOX2, NANOG, TERT, ZFP42, UTF1, CHD1, c-Myc, KLF4, KLF5, EpCAM, ESRRB, CDH1, TDH. | Silenced in one line; Downregulated but not silenced.  |
| itbudsabong, 2017     | Pig | Embryonic fibroblasts                | Retrovirus pMX hOSKM + lin28   | LIF+bFGF  | 5 dias                             | EB+ spontaneous cardiac differentiation +teratoma                     | -                              | AP, OCT4, SOX2, SSEA1  | SOX2, NANOG   | Continuous expression of SOX2 and LIN28  |
| r, 2017               | Pig | Venus-expressin neonatal fibroblasts | Lentivirus TetO-pOSKM  | LIF +2i or bFGF+2i                                | 1 <sup>st</sup> passage as 17 days | EB+ chimera+ teratoma (only + for LIF+2i)                             | -                              | NANOG, SSEA3. LIF iPSCs presented SSEA4                          | OCT4, KLF4, c-MYC, NANOG, LIN28, NROB1  |  |
| 18                    | Pig | Fetal fibroblasts                    | Electroporation - episomes pCXLE-hOCT3/4-shp53, pCXLE-hSK; pCXLE-hUL | bFGF+2i   | 13 days                            | EB+ c Contribution to ICM and TE 48h after injection into parthenotes | -                              | NANOG, OCT4, SOX, SSEA1  | OCT4, SOX2, NANOG,  | Presence of pCXLE-sSK and pCXLE-hUL at 20p. After subcloning at 20p, several lines were transgene free |
| , 2018                | Pig | Embryonic fibroblasts                | Retrovirus pMX pOSKM   | LIF+2i with or without Albumax                    | First passage at 30d               | EB + teratoma + contribution to parthenotes                           | Albumax 24.96% Control: 12.85% | AP, OCT4,SOX2, SSEA-1, NANOG                                     |   |  |
| o, 2018               | Pig | Embryonic fibroblasts                | Lentivirus, hOSKM  | SB medium, bFGF                                   | 5 days                             | -   | -                              | AP, NANOG, SOX2, SSEA1, SSEA4, TRA-1-81                          | OCT4, KLF4, NANOG, NODAL  | Present  |

iPSC: induced pluripotent stem cells; PMX: Moloney murine leukemia virus (MMLV); hOSKM: human Oct4, Sox2, KLF4, c-Myc; mOSKM: mouse Oct4, Sox2, KLF4, c-Myc; bFGF: basic fibroblast growth factor; EB: embryoid body; SSEA-1: stage-specific embryonic antigen-1; AP: alkaline phosphatase; NANOG: Nanog Homeobox; REX-1: ZFP-42; endo SOX2: endogenous Sex determining region Y-box 2; LIN28: Lin-28 Homolog A; TDF1: Teratocarcinoma-Derived Growth Factor 1; TERT: Telomerase Reverse Transcriptase; DMNT3B: DNA Methyltransferase 3 Beta; TRA-1-60:

T cell receptor alpha locus; TRA-1-81: PODXL; CDH1: Cadherin 1; MSCs: mesenchymal stem cells; c-MYC: MYC Proto-Oncogene; VPA: Valproic acid; SSEA-4: stage-specific embryonic antigen-4; STAT3: Signal Transducer And Activator Of Transcription 3; LIF: leukemia inhibitor factor; mSKM: mouse Sox2, KLF4, c-Myc; OSKM: Oct4, Sox2, KLF4, c-Myc; 2i: PD 0325901 (MEK inhibitor) and CHIR 99021(GSK3 inhibitor); 3i: PD 0325901 (MEK inhibitor), CHIR 99021(GSK3 inhibitor) and SU 5402 (FGFR inhibitor); FGF5: Fibroblast Growth Factor 5; STELLA: Dppa3 or PGC7; REX-1: ZFP-42; 5i: small molecules (PD 0325901 (MEK inhibitor), CHIR 99021(GSK3 inhibitor), forskolin, SB43152 (Activin/BMP/TGF- $\beta$  pathway inhibitor), and sodium butyrate); pCX-OKS-2A: vector encoding three transcription factors (Oct3/4, Sox2 and Klf4) connected with 2A self-cleaving peptide (2A); pCX-c-Myc: vector encoding c-Myc; ICM: inner cell mass; TE: trophectoderm; SCF: Stem Cell Factor; FGFR1: Fibroblast growth factor receptor 1; FGFR2: Fibroblast growth factor receptor 2; ERAS: ES Cell Expressed Ras; UTF1: Undifferentiated embryonic cell transcription factor 1; SALL4: Sal-like protein 4; ESRRB: Steroid hormone receptor ERR2; DPPA5: Developmental Pluripotency Associated 5; OSKM: Oct4, Sox2, KLF4, c-Myc; OSKMN: Oct4, Sox2, KLF4, c-Myc, Nanog; EpCAM: Epithelial Cell Adhesion Molecule; OCLN: Occludin; AA: Activin A, SAHA: Epigenetic modifier; NaB: sodium butyrate (histone deacetylase inhibitor); ZFP-42: Zinc Finger Protein 42 Homolog; KLF5: Kruppel-like factor 5.



## Supplemental material 4 – Horses

Table describing isolation and characterization of iPSC from horses.

| Author/year       | Cell type  | Repg. System               | Supplementation                         | Days until colony | Differentiation                                       | Reprogramming efficiency | Immunocytochemistry                                       | Gene expression (endogenous)           | Gene expression (exogenous) |
|-------------------|--|----------------------------|---|-------------------|---|--------------------------|---|--|-----------------------------|
| Nagy, 2011        | Fetal fibroblast   | PiggyBac transposon, mOSKM | LIF+bFGF +2i+A8301+Thiazovivin+SB431542 | 17-18 days        | EB+teratoma   | 0.028%                   | AP, NANOG, SSEA1, SSEA4, TRA-60, TRA1-81                  | Oct4, Nanog, Klf4                      |                             |
| Khodadadi, 2012   | Adult fibroblast   | PMX hOSK                   | LIF+ bFGF+ eFGF                         | 8-10 days         | EB+teratoma   | -                        | AP, OCT4, NANOG, SSEA1, SSEA4                             | OCT4, SOX2, NANOG, STAT3               | OCT4, SOX2, KLF4, C-MYC     |
| Breton, 2013      | Foal fibroblast  | PMX, mOSKM                 | LIF+bFGF                                | 9 days            | EB+teratoma   | -                        | AP, OCT4, SOX2, NANOG, REX1, TRA1-60, SSEA1, SSEA4, LIN28 | OCT4, SOX2, LIN28, NANOG, DNMT3B, REX1 | OCT4, C-MYC                 |
| Whitworth, 2014   | Adult fibroblast   | Lentivirus, hOSKM          | LIF                                     | -                 | EB+ in vitro teratoma assay                           | -                        | AP, NANOG, REX1, SSEA4, TRA1-60, TRA1-81                  | NANOG, OCT4, TERT                      | OCT4, SOX2                  |
| Sharma, 2014      | Foal keratinocytes   | PMX, mOSKM                 | LIF                                     | 5 days            | EB+teratoma + neuronal differentiation                | 0.18%                    | AP, OCT4, SOX2, LIN28, SSEA1                              | OCT4, SOX2, LIN28, NANOG, DNMT3B, REX1 | OCT4, SOX2, KLF4, C-MYC     |
| Quattrocchi, 2016 | Myogenic mangioblast and peripheral mesenchymal stem cells                   | Retroviral pMX, hOSKM      | bFGF                                    | -                 | Teratoma + in vitro spontaneous differentiation       | 0.0001%                  | AP, OCT4, SOX2, NANOG, LIN28                              | OCT4, SOX2, NANOG, LIN28               | Silenced                    |
| Lee, 2016         | Adult eAdMSC   | Lentivirus TetO, mOSKM     | LIF                                     | 15-16 days        | EB+teratoma+ myogenic differentiation (in vivo- mice) | 0.003%                   | AP, OCT4, SOX2, NANOG, SSEA1,                             | OCT4, SOX2, NANOG, LIN28, REX          | -                           |
| Moro, 2018        | Adult fibroblast   | Lentivirus, hOSKM          | LIF + bFGF                              | 10-12 days        | EB+ spontaneous differentiation in vitro              | -                        | AP, OCT4, SOX2, C-MYC                                     | OCT4, REX1, NANOG                      | -                           |
| Pessôa, 2019      | Adult fibroblast and adipose tissue mesenchymal cells, umbilical cord tissue | Lentivirus, hOSKM          | bFGF                                    | 11-15 days        | EB+ spontaneous differentiation in vitro              | -                        | AP, OCT4  | OCT4, NANOG                            | Present                     |

iPSC: induced pluripotent stem cells; 2i: PD 0325901 (MEK inhibitor) and CHIR 99021(GSK3 inhibitor); A8301: Activin/NODAL/TGF- $\beta$  pathway inhibitor; SB31542: Activin/BMP/TGF- $\beta$  pathway inhibitor; EB: embryoid body; AP: alkaline phosphatase; NANOG: Nanog Homeobox; SSEA-1: stage-specific embryonic antigen-1; TRA-1-60: T cell receptor alpha locus; TRA-1-81: PODXL; OCT4: octamer-binding transcription factor 4; KLF4: Kruppel-like factor 4; PMX: Moloney murine leukemia virus (MMLV); hOSK: human Oct4, Sox2, KLF4; LIF: leukemia inhibitor factor; bFGF: basic fibroblast growth factor; eFGF: epidermal growth factor; REX-1: ZFP-42 (Zinc Finger Protein 42 Homolog); SOX2: Sex determining region Y-box 2; LIN28: Lin-28 Homolog A; SSEA-4: stage-specific embryonic antigen-4; DNMT3B: DNA Methyltransferase 3 Beta; TERT: Telomerase Reverse Transcriptase; hOSKM: human Oct4, Sox2, KLF4, c-Myc; mOSKM: mouse Oct4, Sox2, KLF4, c-Myc.



## Supplemental material 5 – Dogs

Table describing isolation and characterization of iPSC from dogs.

| Author/year     | Cell type                   | Repg. System                          | Supplementation                    | Days until colony | Differentiation                                | Reprogramming efficiency            | Immunocytochemistry                            | Gene expression (endogenous)  | Gene expression (exogenous)                   |
|-----------------|-----------------------------|---------------------------------------|------------------------------------|-------------------|--|-------------------------------------|--|---|---|
| Shimada, 2010   | embryonic fibroblast        | Retrovirus, predicted canine OSKM     | LIF+bFGF+2i+ valproic acid + A8301 | 7 days            | Direct differentiation                         | -                                   | AP, Oct3/4                                     | -   | -   |
| Luo, 2011       | Adult testicular fibroblast | Lentivirus, hOSKM                     | LIF+bFGF                           | 6-8 days          | EB   | -                                   | OCT4, SOX2, NANOG, LIN28, TRA-1-60, SSEA4      | SOX2, c-MYC, LIN-28, SOCS3, STAT3, GBX2                                 | Expressed in different levels                 |
| Lee, 2011       | Adult fibroblast            | lentivirus, hOSKM                     | LIF+bFGF                           | 12-15 days        | EB/Teratoma                                    | Fibro: +- 0.84%<br>cAdMSC: +- 1.74% | AP, Oct-4, Sox2, Nanog, TRA-1-60, SSEA-4       | Oct-4, Sox2, Nanog  | -   |
| Whitworth, 2012 | Adult dermal fibroblast     | Lentivirus, hOSKMLN                   | LIF                                | 12 days           | EB/teratoma                                    | 0.0007%                             | AP, Oct4, SSEA1, SSEA4, TRA1-60, TRA1-81, Rex1 | Oct4, Nanog, Telomerase   | "barely detectable or absent"                 |
| Koh, 2013       | Adult skin fibroblast       | Retrovirus, mOSKM                     | LIF+bFGF                           | 7-9 days          | EB direct differentiation /Teratoma            | -                                   | AP, SSEA1                                      | OCT4, SOX2, NANOG, LIN28, PODXL, FGF5, REX1, LAMP1, TERT, partial DPPA5 | "Not fully silenced"                          |
| Baird, 2015     | Adult aneuploidy cAdMSC     | Retrovirus, hOSKM +GFP                | LIF+bFGF                           | +/- 3 days        | EB   | -                                   | AP, Oct-4, TRA-1-60, TRA-1-81, SSEA-4          | -   | Silenced (absent GFP expression)              |
| Nishimura, 2017 | embryonic fibroblast        | Lentivirus, mOSKM                     | Feeder free, bFGF                  | 5 days            | EB/ no teratoma                                | 0.048%                              | OCT4, NANOG, SSEA4                             | OCT3/4, C-MYC, KLF4, SOX2, GBX2, NANOG                                  | Expressed                                     |
| Gonçalves, 2017 | Fetal fibroblast            | Lentivirus, mOSKM, hOSKM, mOSKM+hOSKM | bFGF                               | 11 days           | EB/teratoma                                    | -                                   | AP, OCT4, SOX2                                 | OCT4, SOX2  | Silenced on hOSKM ciPS, present on mOSKM ciPS |
| Chow, 2017      | Adult skin fibroblasts      | Sendai virus, OSKM                    | Lif                                | -                 | EB/Teratoma induction into mesenchymal lineage | -                                   | OCT3/4, NANOG, CD105                           |   | Non- integrative                              |
| Tsukamoto, 2018 | Embryonic fibroblasts       | Sendai virus SeVdp, hOSKM             | LIF+bFGF                           | 7 days            | EB/ Teratoma                                   | 0.02%                               | AP, NANOG, SSEA1, TRA-1-60 (partially)         | OCT4, SOX2, NANOG   | Non-integrative                               |

iPSC: induced pluripotent stem cells; OSKM: Oct4, Sox2, KLF4, c-Myc; LIF: leukemia inhibitor factor; bFGF: basic fibroblast growth factor; 2i: PD 0325901 (MEK inhibitor) and CHIR 99021(GSK3 inhibitor); A8301: Activin/NODAL/TGF- $\beta$  pathway inhibitor; AP: alkaline phosphatase; OCT3/4:

octamer-binding transcription factor 3/4; hOSKM: human Oct4, Sox2, KLF4, c-Myc; EB: embryoid body; OCT4: octamer-binding transcription factor 4; SOX2: Sex determining region Y-box 2; NANOG: Nanog Homeobox; LIN28: Lin-28 Homolog A; TRA-1-60: T cell receptor alpha locus; SSEA-4: stage-specific embryonic antigen-4; REX-1: ZFP-42 (Zinc Finger Protein 42 Homolog); SOCS3: Suppressor of cytokine signaling 3; STAT3: Signal Transducer And Activator Of Transcription 3; TRA-1-81: PODXL; GBX2: Gastrulation Brain Homeobox 2; cAdMSC: canine adipose derived mesenchymal cells; TERT: Telomerase Reverse Transcriptase; DPPA5: Developmental Pluripotency Associated 5; SSEA-1: stage-specific embryonic antigen-1; FGF5: Fibroblast Growth Factor 5; LAMP1: Lysosomal Associated Membrane Protein 1.

## Supplemental material 6 – Rabbits

Table describing isolation and characterization of iPSC from rabbits.

| Author/year         | Cell type                     | Repg. System      | Supplementation | Days until colony | Differentiation                        | Reprogramming efficiency | Immunocytochemistry             | Gene expression (endogenous) | Gene expression (exogenous) |
|---------------------|-------------------------------|-------------------|-----------------|-------------------|--|--------------------------|---------------------------------|------------------------------|-----------------------------|
| Honda, 2010         | Adult liver and stomach cells | Lentiviral, hOSKM | bFGF+ mLif      | 8-15 days         | EB+ induced differentiation+ teratoma  | 0.55%<br>0.25%           | AP, SSEA1, SSEA4, OCT3/4, NANOG | OCT4, SOX2, KLF4, c-MYC      | silenced                    |
| Osteil, 2013        | Adult fibroblast              | Retroviral, hOSKM | bFGF            | -                 | EB+ teratoma                           | -                        | AP, OCT4                        | OCT4, NANOG                  | silenced                    |
| Phakdeedindan, 2018 | Embryonic fibroblast          | Retroviral, hOSKM | LIF+bFGF        | 4 days            | EB+ Teratoma + Cardiac differentiation | 0.191%                   | AP, OCT-3/4, SSEA-4             | OCT3/4, NANOG, SOX2, KLF4    | silenced                    |

iPSC: induced pluripotent stem cells; bFGF: basic fibroblast growth factor; mLIF: mouse leukemia inhibitor factor; AP: alkaline phosphatase; OCT3/4: octamer-binding transcription factor 3/4; SSEA-1: stage-specific embryonic antigen-1; SSEA-4: stage-specific embryonic antigen-4; EB: embryoid body; NANOG: Nanog Homeobox; KLF4: Kruppel-like factor 4; c-MYC: MYC Proto-Oncogene; LIF: leukemia inhibitor factor.

## Supplemental material 7 – Avian

Table describing isolation and characterization of iPSC from avian species.

| Author/year    | Animal                         | Cell type                    | Repg. System                       | Supplementation | Days until colony | Differentiation                    | Reprogramming efficiency | Immunocytochemistry     | Gene expression (endogenous)                      | Gene expression (exogenous)                    |
|----------------|--------------------------------|------------------------------|------------------------------------|-----------------|-------------------|------------------------------------|--------------------------|-------------------------|---|--|
| Lu, 2012       | Quail                          | Embryonic fibroblast         | Lentivirus, hOSKMNL                | bFGF            | 17 days           | EB+neural differentiation+ chimera | -                        | AP, POU5F1, SOX2        | -   | OCT4, SOX2, c-MYC, LIN28, NANOG                |
| Roselló, 2013  | Zebra finch, chicken and quail | Embryonic fibroblast         | Lentivirus, mOSKM (Stemcca)        | LIF+ bFGF+ 3i   | 5 days            | EB + teratoma + chimera            | -                        | AP, SSEA1               | Oct4, Sox2, c-Myc, Nanog, Vasa                    | Silenced: Chicken, Present: quail, zebra finch |
| Yu, 2014       | Chicken                        | Embryonic fibroblast         | Mini circle DNA, hOSLN             | bFGF            | 2 weeks           | EB + chimera                       | -                        | AP, POU5F1, SOX2, NANOG | Pou5f1, Sox2, Nanog, Rex-1, Slc2a3, Dnmt3b, Terf1 | -  |
| Choi, 2016     | Chicken                        | Embryonic fibroblast         | Retroviral, hOSKM, +Nanog          | bFGF+Lif        | 8 days            | -                                  | -                        | AP, SSEA1               | Nanog, Sox2                                       | -  |
| Fuet, 2017     | Chicken                        | Embryonic fibroblast         | Piggybac transposon, cOSKM + NANOG | LIF             | 7-8 days          | EB                                 | -                        | AP, SSEA1, EMA1         | ALPL, OCT4, SOX2, NANOG, CLDN3, SALL4, TRIM71     | -  |
| Kim, 2017      | Chicken                        | Adult feather follicle cells | pMX mOSKM + NANOG                  | LIF+bFGF        | 3-4 days          | EB + chimera                       | -                        | SSEA1                   | NANOG, POUV, LIN28                                | Present  |
| Katayama, 2018 | Chicken                        | Fibroblast                   | Lentivirus, mOSKM+ Lin28           | bFGF            |                   | EB + teratoma                      | -                        | AP, SSEA1, SSEA3, SSEA4 | PouV, Sox2, Nanog, Tbx3, Esrrb, Rex1              | Present  |

iPSC: induced pluripotent stem cells; hOSKMNL: human Oct4, Sox2, KLF4, c-Myc, Nanog, Lin28; bFGF: basic fibroblast growth factor; EB: embryoid body; AP: alkaline phosphatase; POU5F1: POU class 5 homeobox 1 (OCT4); SOX2: Sex determining region Y-box 2; c-MYC: MYC Proto-Oncogene; LIN28: Lin-28 Homolog A; NANOG: Nanog Homeobox; mOSKM: mouse Oct4, Sox2, KLF4, c-Myc; LIF: leukemia inhibitor factor; 3i: PD 0325901 (MEK inhibitor), CHIR 99021(GSK3 inhibitor) and SU 5402 (FGFR inhibitor); SSEA-1: stage-specific embryonic antigen-1; hOSNL: human Oct4, Sox2, Nanog, Lin28; REX-1: ZFP-42 (Zinc Finger Protein 42 Homolog); SLC2A3: Solute Carrier Family 2 Member 3; DMNT3B: DNA Methyltransferase 3

Beta; cOSKM: chicken Oct4, Sox2, KLF4, c-Myc; TERF1: Telomeric repeat-binding factor 1; EMA1: Erythrocyte merozoite antigen 1; CLDN3: Claudin 3; TRIM71: Tripartite Motif Containing 71; PMX: Moloney murine leukemia virus (MMLV); TBX3: Tbox 3; ESRRB: Steroid hormone receptor ERR2.

## Supplemental material 8 – Wild

Table describing isolation and characterization of iPSC from wild species.

| Author/year      | Animal  | Cell type             | Repg. System                             | Supplementation  | Days until colony                 | Differentiation  | Reprogramm ing efficiency                 | Immunocytoche mistry  | Gene expression (endogenous)  | Gene expression (exogenous)  |
|------------------|---|-----------------------|--|--|-----------------------------------|--|---|---|---|--|
| Ben-Nun, 2011    | Drill primatenort hen white rhinoceros;                   | Fibroblast            | Drill: Retrovirus, hOSKM<br>Rhino: VSV.G | bFGF   | 30 days(Drill)<br>27 days (Rhino) | EB+ teratoma (Drill)   | Drill: 0.0003 to 0.001%<br>Rhino: 0.0006% | Drill: Sox2, Nanog, Oct4 and AP<br>Rhino: Sox2, Nanog, OCT4 | Drill: Oct4, Sox2, Nanog  | Silenced   |
| Rosselló, 2013   | Mouse, Chicken, Quali, Zebra finch, zebrafish, Drosophila | Fibroblast            | Lentivirus, mOSKM (Stemcca)              | LIF (mouse)<br>LIF+ bFGF+ 3i (avian)<br>LIF+ 3i (zebrafish)<br>3i (drosophila) | 5-7 days                          | EB (avian, fish, drosophila) + teratoma (quali, chicken)<br>+ Chimera (chicken and fish) | -   | AP, SSEA1 (exception of Dosophila)                          | Oct4, Sox2, c-Myc, Vasa, Nanog (except fish)<br>Drosophila: Vasa, VVL, dMyc, SoxN, Dichaete, Escargot, Snail,<br>Oct4, Sox2, Nanog, Rex1, Otx2, Gata6 | Silenced- Chicken,zebra fish present- quali, zebra finch, Drosophila |
| Menzorov, 2015   | Mink  | Embryonic fibroblast  | Lentivirus LeGo, hOSKM                   |  | 2 weeks                           | Teratoma   | -   | -   |   | c-Myc and KLF4: silenced; Oct4 and Sox2: not analyzed                |
| Weeratunga, 2018 | Tasmania devil  | Adult fibroblasts     | Lentivirus, hOSKMNL                      | LIF+bFGF   | 12-14 days                        | EB+ in vitro teratomas   | 0.0005%–0.00075%                          | AP, OCT4, SOX2, NANOG                                       | OCT4/POU5F1, POU5F3, NANOG, SOX2, DAX1, ESRRB   | Silenced   |
| Whitworth, 2018  | Platypus  | Adult fibroblasts     | Lentivirus, hOSKMNL                      | LIF+bFGF+3i+SB4315 42  |                                   | EB+ in vitro teratomas   | -   | AP, SSEA1, SSEA4, TRA1–60                                   | OCT4, SOX2, and NANOG   | Sox2: silenced; rest: present  |
| Verma, 2012      | Snow leopard  | Adult ear fibroblast  | Retrovirus pMX, hOSKMNL                  | LIF  | 3 days                            | Teratoma   | -   | AP, NANOG, OCT4, SSEA4                                      | OCT4, NANOG   | OCT4, SOX2, NANOG: silenced<br>KLF4, c-MYC: present                  |
| Verma, 2013      | Bengal tiger, leopard, Serva                              | Adult ear fibroblast  | Retrovirus pMX, hOSKM+NANOG              | LIF  | 3 days                            | EB+Teratoma  | -   | AP, NANOG, OCT4, SSEA4                                      | OCT4, NANOG   | OCT4, SOX2, NANOG: silenced<br>KLF4, c-MYC: present                  |
| Mo, 2014         | Bat   | Embryonic fibroblasts | PiggyBac hOSKMNL+NR5A2+ bat MIR302/367   | LIF+3i   | 14 days                           | EB+teratoma  | -   | AP, Oct4, Sox2, Nanog, TBX3, TRA-1-60                       | Oct4, Sox2  | -  |
| Katayama, 2016   | Prairie Vole  | Embryonic fibroblasts | PiggyBac mOSKMNL                         | bFGF+LIF+2i+ thiazovivin   | 12-19 days                        | EB+teratoma  | -   | AP, SSEA-1, SSEA-4, OCT4 (not sure endo or exogenous)       | Tbx3, Esrrb, Sox2, Oct3/4   | -  |



iPSC:

|                 |                                     |  |   |  |            |   |   |  |   |                  |
|-----------------|-------------------------------------|--|---|--|------------|---|---|--|---|------------------|
| Liu, 2008       | Rhesus monkey                       | Adult ear fibroblasts                    | pMX retrovirus, monkey OSKM                                 |  | 26-29 days | EB+direct differentiation+teratoma                  | - | AP, NANOG, SSEA-4, TRA-1-60, TRA-1-81                      | OCT4, SOX2, NANOG, DPPA2, DPPA4, SALL4, Lin28, CRIPTO, DNMT3b, NFE2L3 | Silenced         |
| Tamioka, 2010   | Marmoset                            | Fetal liver cells                        | Retrovirus, hOSKMNL   | LIF  | 4-5 weeks  | EB+teratoma   | - | AP, SSEA-3, SSEA-4, TRA-1-60, TRA-1-81                     | Oct4, Sox2, Klf4, c-Myc, Nanog, Lin28                                 | Silenced         |
| Chan, 2010      | Huntington transgenic rhesus monkey | Huntington fibroblasts                   | pMX retrovirus, monkey OSK                                  | bFGF and Valproic acid                           | 2 weeks    | Teratoma + direct differentiation into neural cells | - | AP, OCT4, SSEA4, TRA-1-60                                  | OCT4, SOX2, KLF4  | OCT4, SOX2, KLF4 |
| Shimozawa, 2013 | Cynomolgus monkey                   | Newborn skin cells and fetal fibroblasts | pMX retrovirus, monkey OSKM                                 | LIF+bFGF   | 4 weeks    | EB+teratoma   | - | Oct-3, SSEA4, TRA-2-54, TRA-1-60, TRA-1-81, Nanog          | POU5F1, SOX2, c-MYC, KLF4, Nanog, REX1                                | Silenced         |
| Fang, 2014      | Rhesus monkey                       | Adult ear fibroblasts                    | Retrovirus, Oct4 + KLF4                                     | First bFGF Later LIF+2i + SB203580               | 7-10 days  | Teratoma+ chimera                                   | - | AP, OCT4, SOX2, NANOG, TRA-1-81/TBX3, TRA-1-60, and SSEA-4 | OCT4, SOX2, SALL4, NANOG  | -                |
| Ramaswamy, 2015 | Orangutan                           | Adult skin fibroblasts                   | pMX retrovirus, hOSKM                                       | bFGF   | 2 weeks    | EB + in vitro differentiation + teratoma            | - | AP, TRA-1-60, TRA-1-81, SSEA4, OCT4, SOX2, NANOG           | -   | -                |
| Thoma, 2016     | Cynomolgus monkey                   | Adult kidney fibroblasts                 | Senday virus, hOSKM   | bFGF + Y-27632                                   | 20 days    | Differentiations into endothelial cells             | - | OCT4, SOX2, NANOG  | -   | -                |
| Zhang, 2017     | Rhesus monkey                       | Dermal fibroblasts (ear)                 | Episomal vectors, hOCT4 +SOX2 +KLF4 + L-MYC + LIN28 + shp53 | bFGF+ CHIR99021+ IWR-1, ACTIVIN A + hVITRONECTIN | 3-4 weeks  | EB+ in vitro differentiations + Teratoma            | - | Oct3/4, Sox2, Nanog, tra-1-81, tra-1-60, SSEA4             | OCT3/4, SOX2, NANOG   | Silenced         |

induced

pluripotent stem cells; hOSKM: human Oct4, Sox2, KLF4, c-Myc; VSV.G: Vesicular stomatitis virus G; bFGF: basic fibroblast growth factor; EB: embryoid body; SOX2: Sex determining region Y-box 2; NANOG: Nanog Homeobox; OCT4: octamer-binding transcription factor 4; AP: alkaline phosphatase; LIF: leukemia inhibitor factor; 3i: PD 0325901 (MEK inhibitor), CHIR 99021(GSK3 inhibitor) and SU 5402 (FGFR inhibitor); SSEA-1: stage-specific embryonic antigen-1; VVL: Ventral veins lacking; d- MYC: MYC Proto-Oncogene; OCT4: octamer-binding transcription factor 4; SOX2: Sex determining region Y-box 2; NANOG: Nanog Homeobox; REX-1: ZFP-42; OTX2: Orthodenticle Homeobox 2; GATA6: GATA Binding Protein 6;

hOSKMNL: human Oct4, Sox2, KLF4, c-Myc, Nanog, Lin28; bFGF: basic fibroblast growth factor; SB43152: Activin/BMP/TGF- $\beta$  pathway inhibitor; SSEA-4: stage-specific embryonic antigen-4; TRA-1-60: T cell receptor alpha locus; DAX1: dosage-sensitive sex reversal, adrenal hypoplasia critical region, on chromosome X, gene 1; ESRRB: Steroid hormone receptor ERR2; PMX: Moloney murine leukemia virus (MMLV); hOSKMN: human Oct4, Sox2, KLF4, c-Myc, Nanog; NR5A2: Nuclear Receptor Subfamily 5 Group A Member 2; KLF4: Kruppel-like factor 4; c-MYC: MYC Proto-Oncogene; mOSKMNL: mouse Oct4, Sox2, KLF4, c-Myc, Nanog, Lin28; miR: microRNA; TBX3: Tbox 3; TRA-1-81: PODXL; DPPA2: Developmental Pluripotency Associated 2; DPPA4: Developmental Pluripotency Associated 4; SALL4: Sal-like protein 4; CRIPTO: Teratocarcinoma-derived growth factor 1; DNMT3B: DNA Methyltransferase 3 Beta; NFE2L3: Nuclear Factor, Erythroid 2 Like 3; OSK: Oct4, Sox2, KLF4; OSKM: Oct4, Sox2, KLF4, c-Myc; POU5F1: POU class 5 homeobox 1; SB203580: pyridinyl imidazole inhibitor; Y-27632: ROCK inhibitor; CHIR99021: GSK3 inhibitor; IWR-1: WNT pathway inhibitor.

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