



**HAL**  
open science

## Generation of embryo chimeras with pluripotent stem cells in non-human primates.

Yannicke Pijoff, Cloé Rognard, Guillaume Marcy, Anais Amzal, Thierry Joly, Marielle Afanassieff, Pierre Savatier, Irène Aksoy

### ► To cite this version:

Yannicke Pijoff, Cloé Rognard, Guillaume Marcy, Anais Amzal, Thierry Joly, et al.. Generation of embryo chimeras with pluripotent stem cells in non-human primates.. 2nd meeting StemPhase, Jun 2022, Rennes (FR), France. hal-04217487

**HAL Id: hal-04217487**

**<https://hal.inrae.fr/hal-04217487v1>**

Submitted on 25 Sep 2023

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

## Poster + Flash-talk

*Yannicke Pijoff*

### **Generation of embryo chimeras with pluripotent stem cells in non-human primates.**

*Yannicke Pijoff<sup>1</sup>, Cloé Rognard<sup>1</sup>, Guillaume Marcy<sup>1</sup>, Anais Amzal<sup>1</sup>, Thierry Joly<sup>2</sup>, Marielle Afanassieff<sup>1</sup>, Pierre Savatier<sup>1</sup> and Irène Aksoy<sup>1</sup>*

<sup>1</sup>Institut Cellule souche et Cerveau, INSERM U1208, INRAE USC1361, Université Claude Bernard Lyon1, 69675 BRON Cedex

<sup>2</sup>ISARA-Lyon, UPSP ICE, VetAgro-Sup, 69007 Lyon

In contrast to rodent pluripotent stem cells (PSCs), which self-renew in the naïve state of pluripotency, conventional non-human primate PSCs (NHP-PSCs) self-renew in the primed state of pluripotency. As a result, they are unable to colonise pre-implantation embryo to form somatic chimeras. We developed an original strategy to reprogram NHP-PSCs to naïve-like pluripotency using LIF, Activin, and chemical inhibitors of PKC and WNT signalling. The resulting cells, called 2CLA, acquired gene expression profile closer to the pluripotent cells of primate embryos. To study chimeric competency, NHP 2CLA cells expressing constitutive GFP were injected into morula-stage rabbit and cynomolgus monkey embryos. The reconstituted embryos were cultured to the late blastocyst stage. While conventional NHP-PSCs (prior to reprogramming) returned only 20% of positive embryos harbouring less than 10 GFP<sup>+</sup> cells (n = 15), 90% of rabbit blastocysts analysed displayed 10 to 50 GFP<sup>+</sup> cells in the epiblast and trophoblast after injection of naïve-like cells. Similar results were obtained after injection of NHP-PSCs into cynomolgus monkey embryos. Thus, after reprogramming to naïve-like pluripotency, NHP-PSCs acquire competence to colonise the epiblast and trophoblast in interspecies chimeras. Chimeric embryos are currently undergoing single-cell RNA-seq analysis to characterize the phenotype of injected NHP 2CLA cells. This work will lead to better understand the mechanisms involved in chimera generation for studying primate development.

