

Comparative molecular characterization of embryonic stem (ES) and germ cells in chicken, as a non mammalian model

B. Pain



Stem cells



Lyon 
U846 INSERM
USC1361 INRA
UCB Lyon1
Stem cell and Brain Research Institute

De la poule ou de l'oeuf....



Une chimère....



Les Holocéphales : les Callorhynchidés, les Chiméridés, les Rhinochiméridés.

Une chimère....

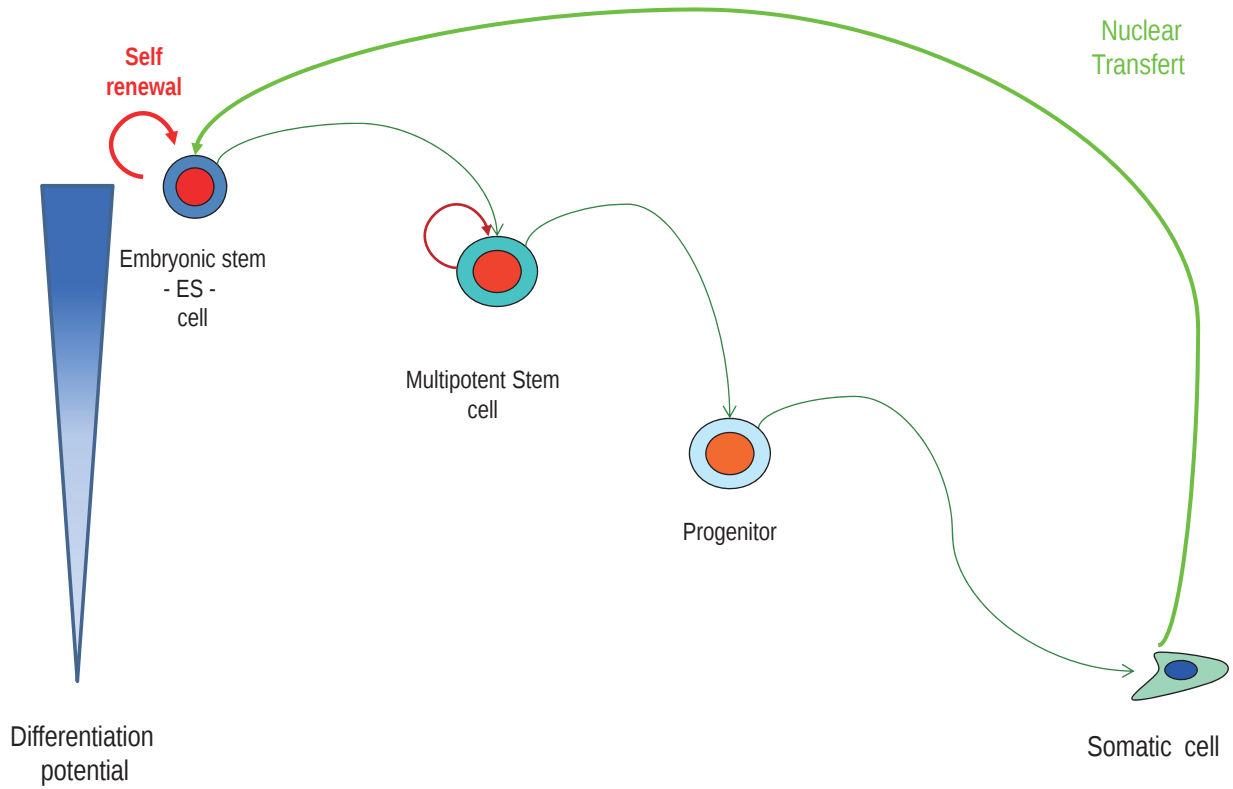


Animal mythologique – Chimère d'Arruzzo – Bronze étrusque

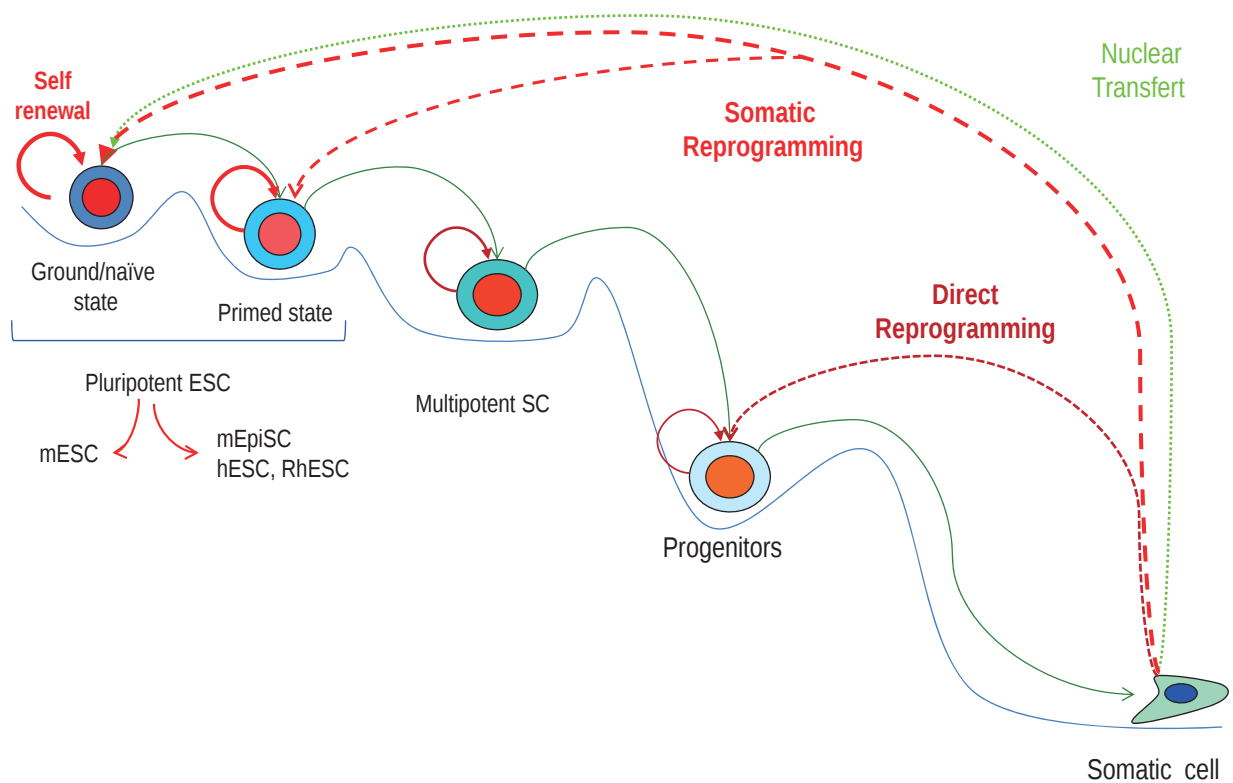
Une chimère....



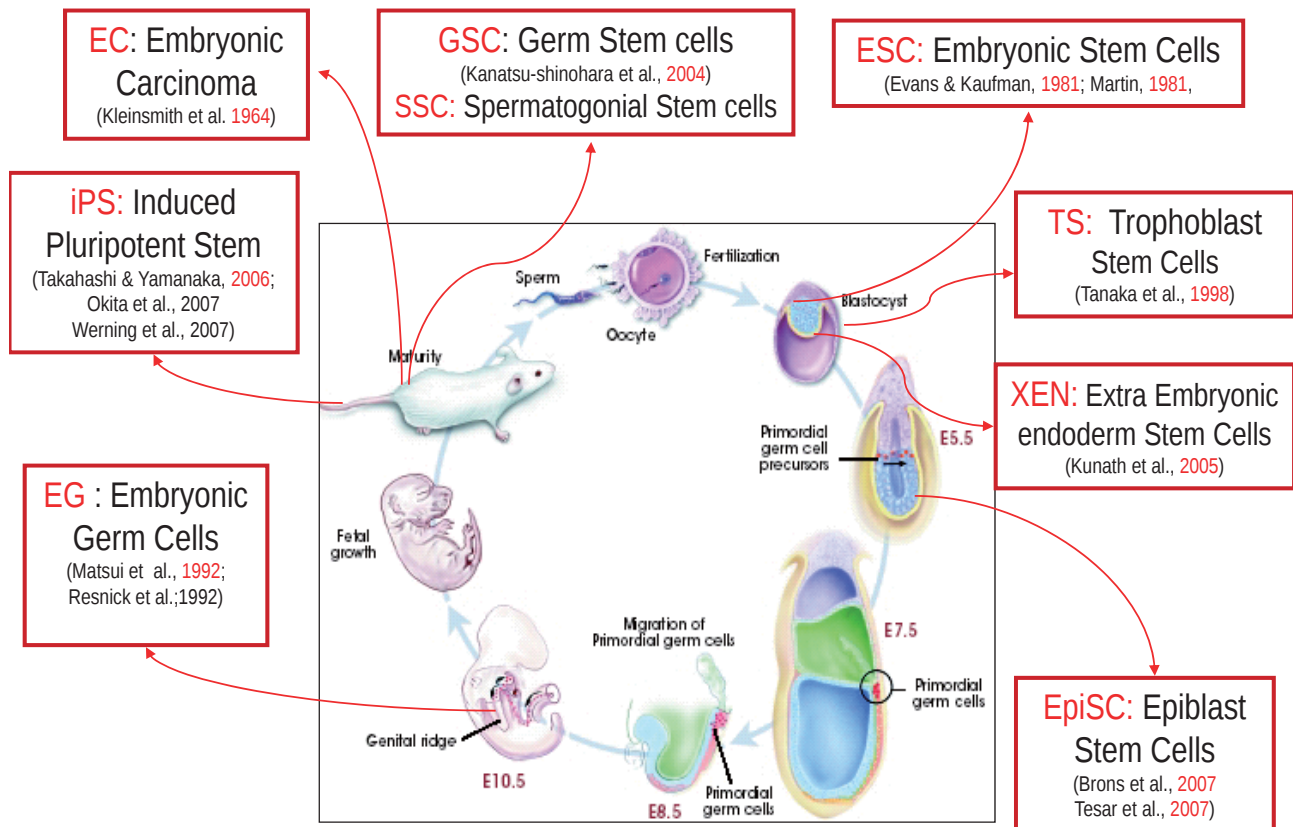
Stem Cells



Stem Cells

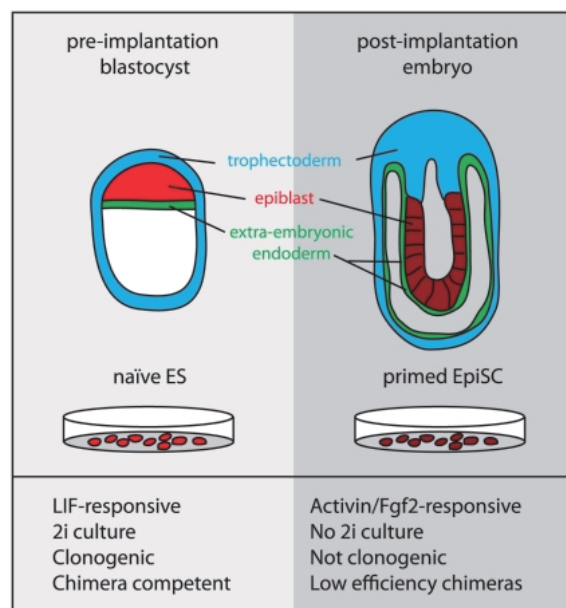


mES cells



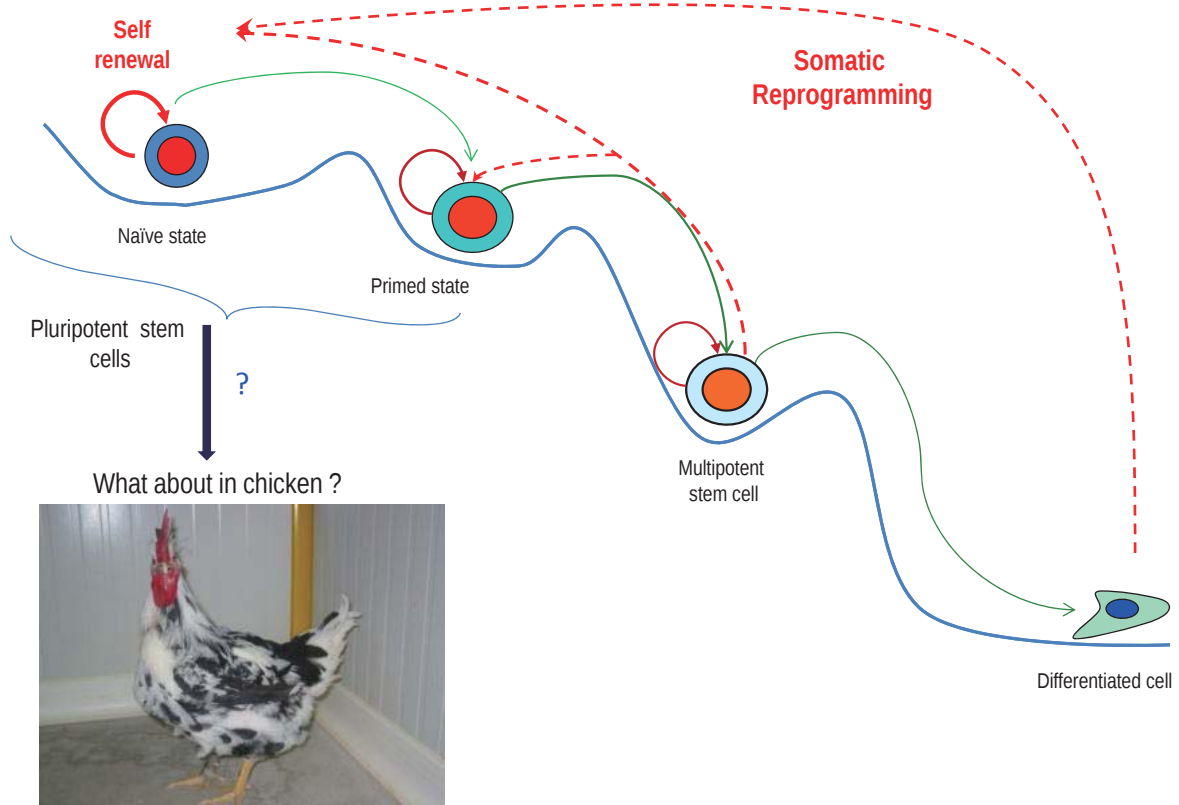
mES cells

Naïve vs Primed cells

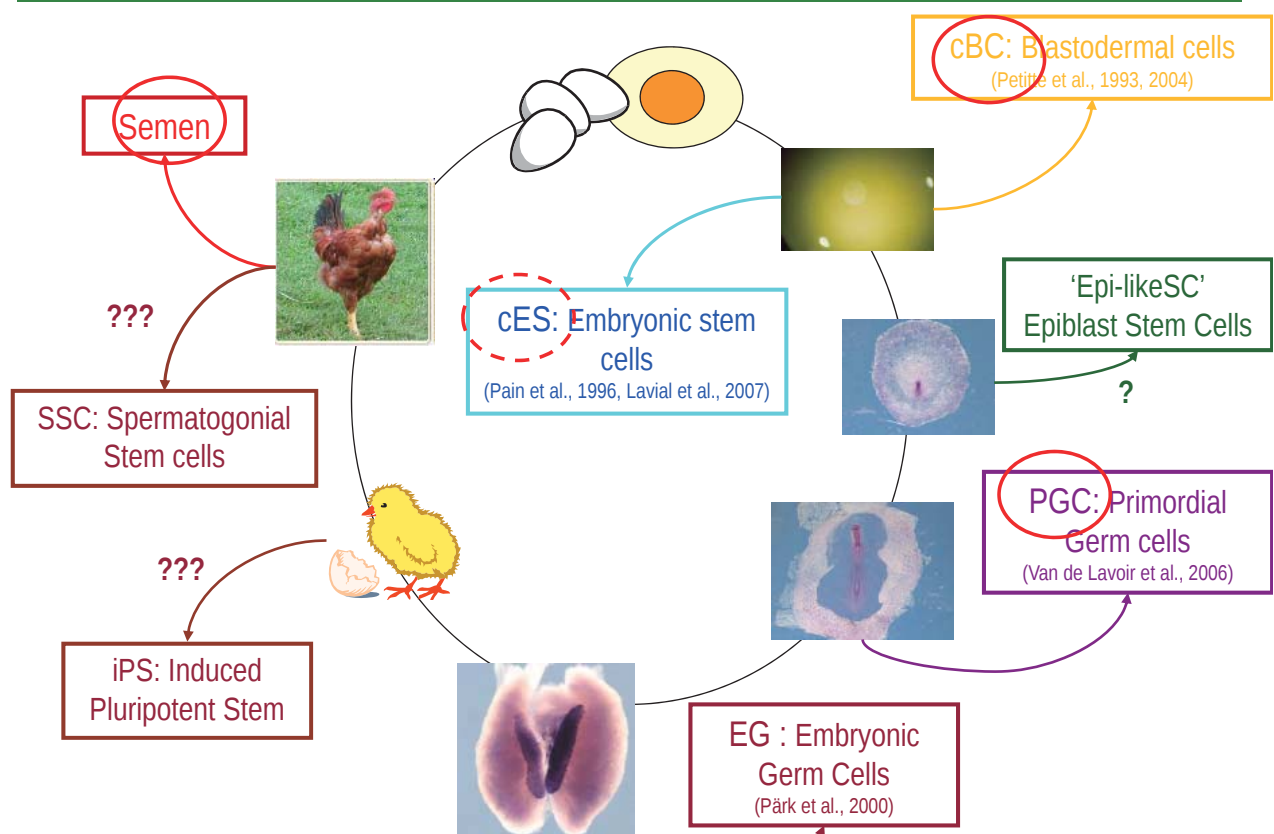


(Blair et al., 2012)

Stem cells



cES cells



Adapted from Lavial & Pain, 2010

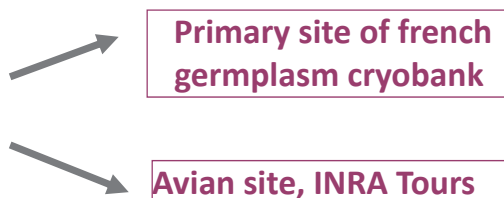
Management of genetic biodiversity in avian species

- 1) a decrease in genetic diversity in poultry due to commercial needs and agriculture restructuring
- 2) Genetic diversity is maintained in small populations exposed to management failure and inbreeding
- 3) High risk of total disappearance in case of health crisis
- ➔ requirement to define a management of reproductive cells to ensure the sustainability of the poultry genetic diversity
- ➔ development of Avian Reproductive biotechnologies for the management of genetic diversity in particular to develop different types of cryoconserved reproductive cells and new strategies for their identification, maintenance and cryopreservation
- ➔ National Cryobank
- ➔ CRB-ANIM Infrastructure project
- ➔ Cryobird project
- ➔ EU & International Symposium

Management of genetic biodiversity in avian species

- ➔ **The National Cryobank –Avian ressources (E. Blesbois – INRA Tours)**
- > 10 years in semen cryobanking (Blesbois et al., 2006, 2007, 2008)

2 sites of storage



- Strong expertise in avian sperm biology and cryoconservation



10 µm

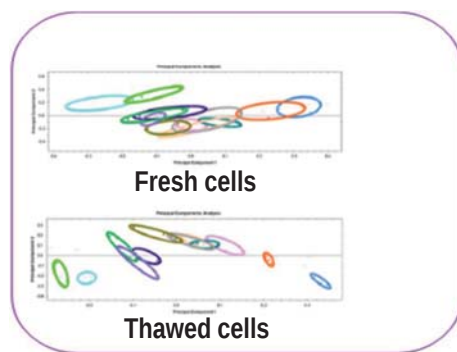


(Blesbois et al)

- Elaboration of freezing-thawing protocols for new species



- Evaluation of quality of cryopreserved spermatozoa

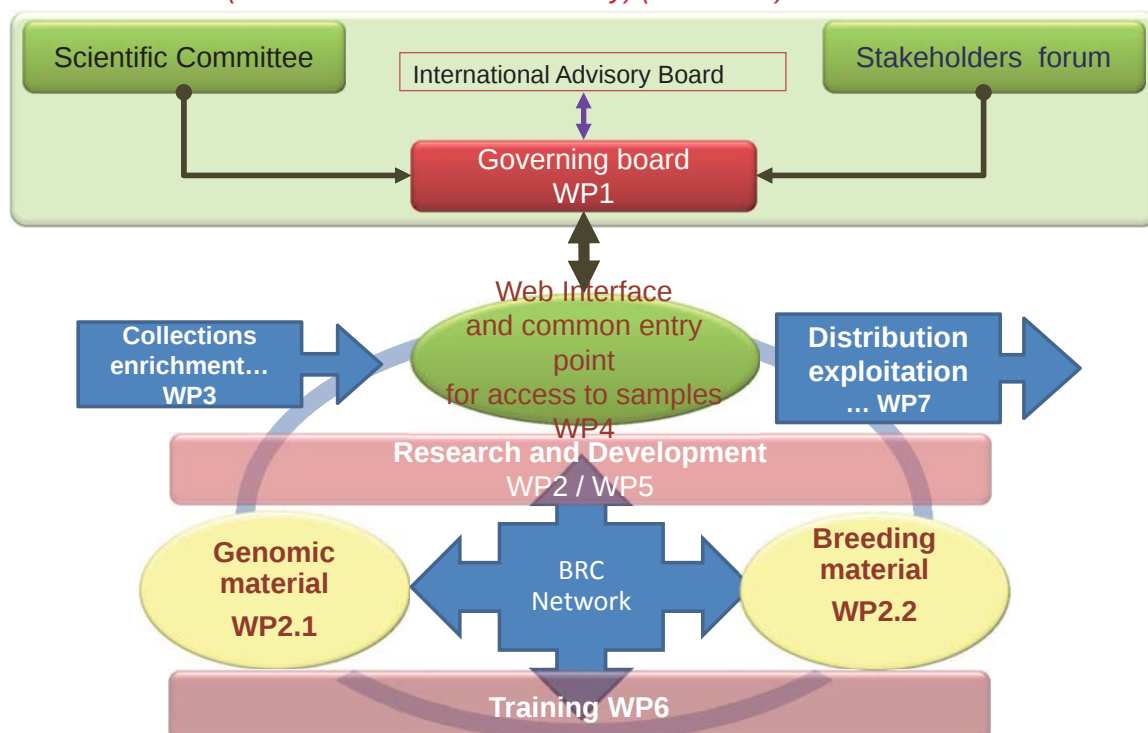


➔ Differential proteomic study of peptide profiles of fresh and thawed cells:

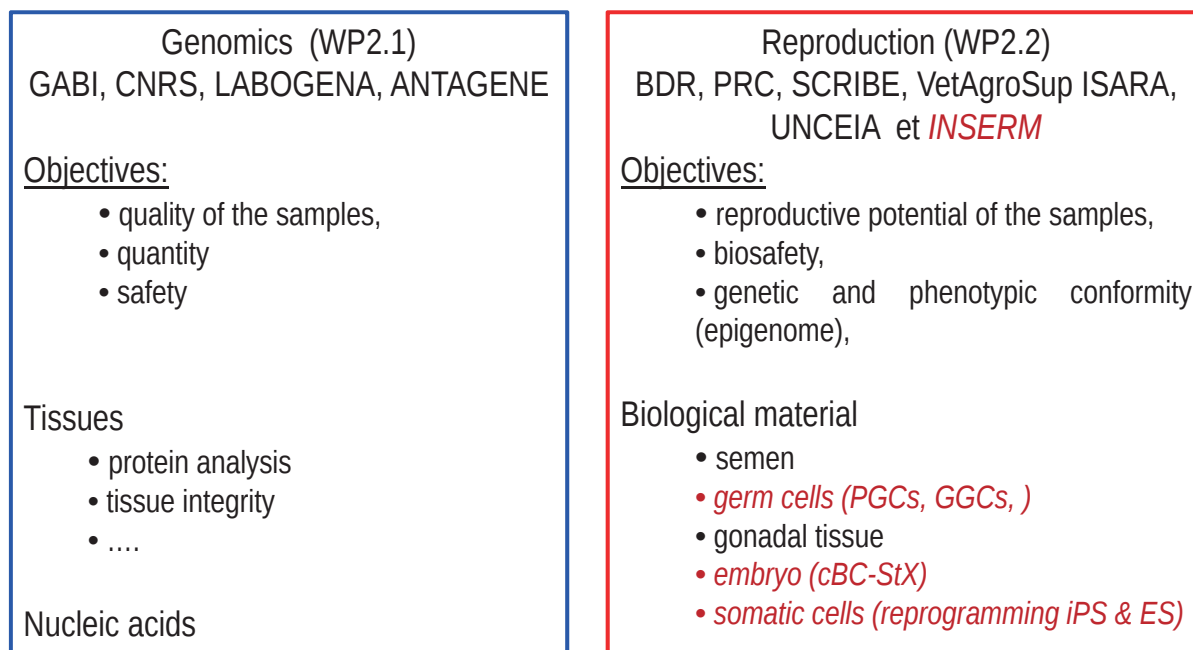
E. Blesbois et al. – INRA Tours



➔ The National Infrastructure – CRB ANIM - Network of Biology Resources Centers for Domestic Animals (M. Tixier Boichard – INRA Jouy) (2013-2021)

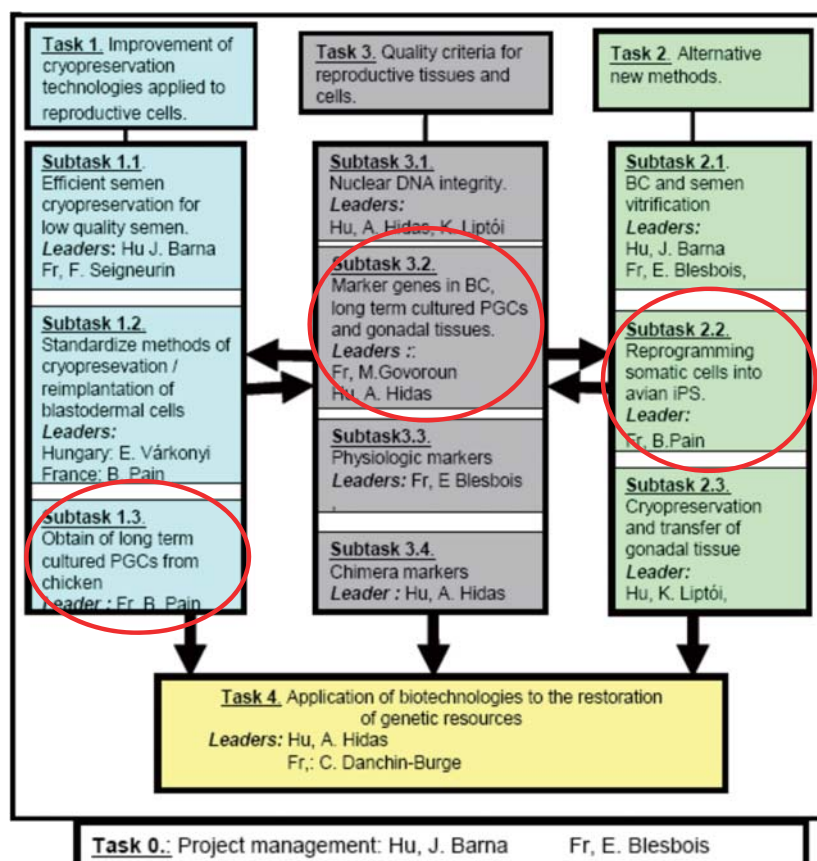


CRB-ANIM -Research & technological Development (WP2)



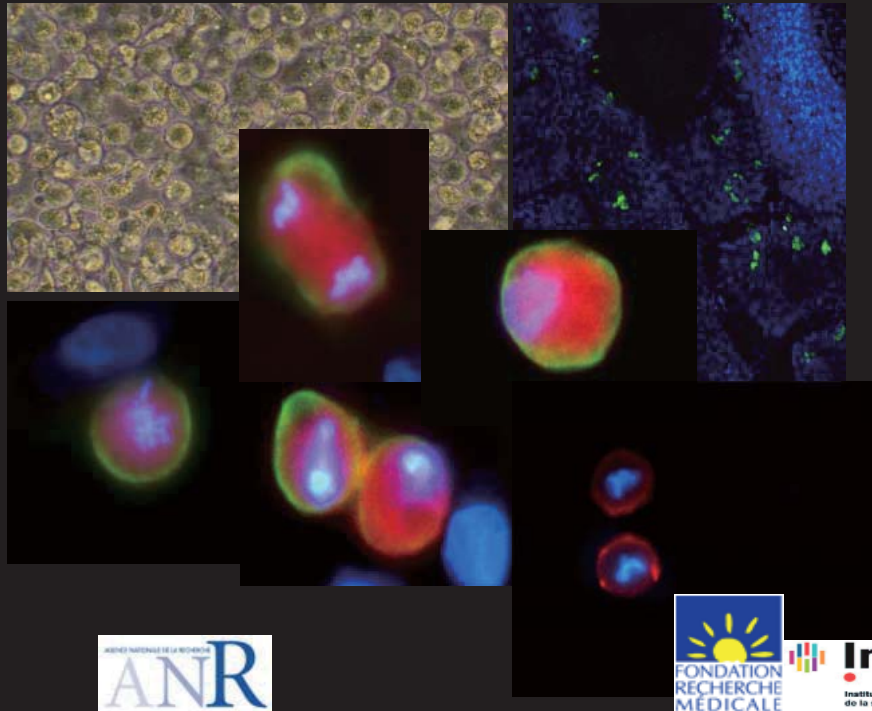
Management of genetic biodiversity in avian species

➔ The Cryobird Project (France – Hungary)



Avian Germplasm Meeting

Lyon, March 12-13, 2013



International Avian Germplasm Meeting

Seoul, October 21-25, 2013

Seoul National University

Pr. JY Han & B. Pain

Thanks to



SBRI - Stem Cell & Brain Research Institute,
U846 INSERM, USC 1361 INRA, UCB Lyon 1



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Funding: ANR , FRM, INRA



