



A Project supported by FY22 Special Coordination Fund for Promoting Science and Technology, Ministry of Education, Culture, Sports, Science & Technology
"Accelerated innovation of fostering system for female scientists"



FResHU F3 Green Symposia Series #3

Sex-determining mechanism of birds

Produced by Dr. Asato Kuroiwa

March 17th 15:30 - 17:00

at Restaurant "Elm" in Faculty House "Enreisou"

registration free



" General introduction of the sex-determining of birds "

by Asato Kuroiwa (Faculty of Science, Hokkaido University)

" Gonadal development in an avian model, the chicken embryo "

by Dr. Craig Smith
(Murdoch Childrens Research Institute, Royal Children's Hospital)

The sex of birds is genetically determined, however the molecular mechanism is not clear. Dr. Smith is a leader in this research field. He and his colleagues report that a major factor of sex-determining is DMRT1 in chickens. In this symposium, he will summarize the current understanding of avian sex determination and gonadal development.

(**Nature** vol.461, 2009; **FEBS J**, on-line ahead, 2011)



This symposium is held as FResHU F3 Green Symposia Series promoting the fresh and active female faculties in the field of Science, Technology and Agriculture at Hokkaido University.

<http://f3project.ist.hokudai.ac.jp>

freshu@synfoster.hokudai.ac.jp



北海道大学 女性研究者支援室
Support Office for Female Researchers
in Hokkaido University



A Project supported by FY22 Special Coordination Fund for Promoting Science and Technology, Ministry of Education, Culture, Sports, Science & Technology
"Accelerated innovation of fostering system for female scientists"



FResHU F3 Green Symposia Series #3

**Dr. Craig Smith, Group Leader,
Comparative Development Group,
Murdoch Childrens Research Institute and
University of Melbourne Department of Paediatrics
Royal Children's Hospital
Parkville, 3052
Melbourne, Australia**



Biography

Craig Smith is a developmental biologist based in Melbourne, Australia. His research interests focus on sex determination and gonadal development in vertebrate embryos. Craig graduated in 1995 with first class Honours and a PhD in Zoology at Macquarie University in Sydney. He studied the mechanism of temperature-dependent sex determination in crocodilian embryos (crocodiles and alligators). He then joined the University of Melbourne Department of Paediatrics as a postdoctoral fellow, working with Andrew Sinclair to pioneer the use of the chicken embryo as a model for vertebrate gonadal development. His research has defined the molecular and cellular processes underlying testis versus ovary development in the avian (chicken) model. He currently heads the Comparative Development Group at the Murdoch Institute in Melbourne.

Title: Gonadal development in an avian model, the chicken embryo

Abstract

The development of sexual phenotype must have a long evolutionary history in animals. However, despite its antiquity, sex is determined by different triggers in different animals. In birds, sex is determined in the early embryo by the inheritance of sex chromosomes (ZZ male and ZW female). We use the chicken embryo as a model for understanding the genetics and cell biology of sex determination and gonadal development. Genes carried on one or both of the sex chromosomes must control gonadal sexual differentiation during embryonic life, producing testes in males (ZZ) and ovaries in females (ZW). This presentation will summarise our current understanding of avian sex determination and gonadal development. This process involves the Z-linked DMRT1 gene. If DMRT1 gene activity is experimentally reduced by RNA interference, the gonads of male embryos (ZZ) are feminised, with ovarian type structure, down-regulation of male markers and activation of female markers. DMRT1 is currently the best candidate gene thought to regulate testicular differentiation. Female development in the avian model appears to be similar to that of mammals; both the FOXL2 and RSPO1/WNT4 pathways are implicated in ovarian differentiation.



This symposium is held as FResHU F3 Green Symposia Series promoting the fresh and active female faculties in the field of Science, Technology and Agriculture at Hokkaido University.

<http://f3project.ist.hokudai.ac.jp>

freshu@synfoster.hokudai.ac.jp

