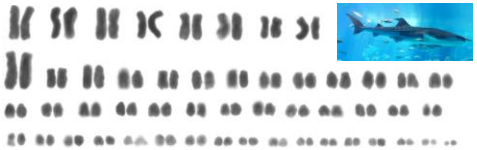
Faculty of Science and Technology
Tokushima University

# Comparative Omics Research on Genome Evolution in Vertebrates

Associate professor Yoshinobu Uno

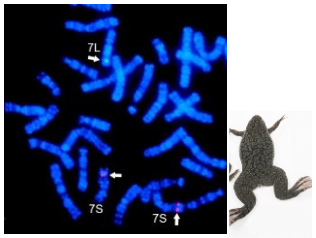
<図表>

Vertebrate species with established cell lines and chromosome analysis
*DNA Res.*, **2017**, *24*, 93; *PLOS ONE*, **2019**, *14*, e0214028, etc.

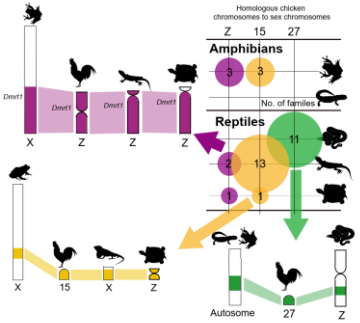


Whale shark chromosomes from cultured cells
*Commun. Biol.*, **2020**, *3*, 652


Bamboo shark
XY chromosomes
*PNAS*, **2025**, *in press*




FISH on chromosomes
of *Xenopus frog*
*Nature*, **2016**, *538*, 336




Sex chromosome evolution in vertebrates
*J. Exp. Zool. A Ecol. Integr. Physiol.*, **2024**, *341*, 230.

Content:

Humans have 46 chromosomes, but it is well known that chromosome numbers vary greatly among species. However, even more than 20 years after the completion of the Human Genome Project, fundamental questions such as “Why do chromosome numbers differ between species?” and “When and how did these differences arise?” remain largely unanswered.

Our laboratory aims to address these questions by integrating cytogenetic approaches—such as chromosome analysis using FISH (fluorescence in situ hybridization) on cultured vertebrate cells established in our laboratory—with bioinformatics-based genome analyses. Our studies focus on key topics such as genomic and chromosomal evolution of vertebrates, evolutionary dynamics of the allotetraploid African clawed frog (*Xenopus*), and origins and evolution of sex-determination systems and sex chromosomes. By doing so, we aim to deepen our understanding of evolutionary biology and genomics, while also contributing insights relevant to medical science.

Keywords : Vertebrates, Chromosomes, Genome evolution

E-mail: unoy@tokushima-u.ac.jp
Tel. 088-656-7270
Fax: 088-656-7270