

Jun Ishigohoka

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Education

2020 –

PhD. Max Planck Institute for Evolutionary Biology, Plön, Germany
PhD project: “Population genomics and brain epigenomics of a migratory songbird”

2017 – 2019

M.S. Molecular Biology and Evolution Christian-Albrechts-University of Kiel, Kiel, Germany
Master’s thesis: “Mosaic genomic landscape of population structure in a migratory songbird”

2012 – 2017

B.S. Biological Sciences Hokkaido University, Sapporo, Japan
Bachelor’s project: “Neural basis for species-specificity and individual variation in learned vocalisation in songbirds”

2015 – 2016 (during bachelor)

Exchange programme at The University of Auckland, Auckland, New Zealand

Research experiences

MPRG Behavioural Genomics, MPI for Evolutionary Biology

Prof Dr Miriam Liedvogel

PhD project (Jan. 2020 –)

- **“Population genomics in a migratory songbird”**
 - Genomic local ancestries in a migratory songbird blackcap
 - Population genomics of polymorphic inversions
 - Genome-wide genealogy
 - Demography of blackcaps
 - Related skills: `lostruct` for local PCA, `MSMC2-decode` for coalescent time in inversion loci, `Pyrho` for recombination rate inference, `SLiM`, `ms`, `msms`, `msprime` for population genetic simulation, `Relate` for genome-wide genealogy inference, `PSMC`, `MSMC2`, `MSMC-IM`, `SMC++`, `fastsimcoal2`, and `Relate` for demography inference, `Satsuma` for synteny analysis, `RAxML` for maximum likelihood phylogeny construction, `VolcanoFinder` and implementation of a genealogy-based method using `tskit` for introgression analysis, `TWISST` for topology weighting and re-implementation for genealogy using `tskit`, `PopGenome` and `VCFTools` for population genomic summary statistics, `BCFTools` and GNU library for variant data manipulation, `R` for statistical analysis and data visualisation, `Python` for simulation and analyses of ARGs using `msprime` and `tskit`.
- **“Single cell epigenomics to understand bird migration”**
 - Single cell brain epigenomics in migratory and resident blackcaps
 - Related skills: Nuclei extraction from flash-frozen brain sample, `cellranger-atac` `Signac`, `Seurat` for scATAC-seq data analysis and visualisation

Master lab rotation (Oct. – Nov. 2018) and master thesis (Mar. – Sep. 2019)

- **“Mosaic genomic landscape of population structure in a migratory songbird”** (Master’s thesis)
 - Population genomics and demography of blackcaps
 - Characterisation of the genomic basis for hybrid speciation in a songbird species-complex (greenish warbler) as an independently developed side project
 - Related skills: `qualimap`, `multiqc`, `Trimmomatic` for quality control of raw reads, `bwa mem` for read mapping, `SAMTools` and `GATK` for variant calling, `MSMC2` for demography inference, `VCFTools` for population genomic summary statistics, `PLINK` for PCA and MDS, `Admixture` for ancestry assignment analysis, `R` for statistical analysis and data visualisation.

Department of Evolutionary Genetics, MPI for Evolutionary Biology

Prof Dr Diethard Tautz

Master lab rotations (Jul. – Aug. 2018, and Jan. – Feb. 2019)

- Reproducibility and robustness of genome-wide association studies using genotype and phenotype data of *Drosophila*
 - Phenotyping of wild-derived *Drosophila* behaviours as an independent side project
 - Related skills: `PLINK` and `GEMMA` for genome-wide association study, phenotyping of pupal size of *Drosophila*
- Effect of transfection on growth rate in human cell culture
 - Related skills: basic handling of a human cell culture system

Department of Neuroethology, Hokkaido University

Prof Dr Kazuhiro Wada

Bachelor project (Apr. – Jul. 2015, Jul. 2016 – Mar. 2017)

- **“Neural basis for species-specificity and individual variation in learned vocalisation in songbirds”**
 - Related skills: behavioural observation, song recording and analysis, brain lesion with ibotenic acid, pharmacological administration by IP injection, perfusion fixation and sectioning of songbird brains, radioisotope *in situ* hybridisation, molecular cloning, immunohistochemistry, Nissl staining
- Characterisation of expression pattern of `DIO2` (Type II iodothyronine deiodinase) in the songbird brain during critical period of song learning: Collaboration with Prof Dr Homma’s group (Teikyo University) as a side project (published):

Honours

Grants

- Yamashina Takehiko grant by Yamashina Institute for Ornithology, Japan: 2022 (300,000 JPY)

Scholarships

- Internal travel grant for conferences and workshops (IMPRS): 2023
- Internal travel grant for conferences and workshops (IMPRS): 2020
- Student Exchange Support Program (scholarship for short-term study abroad) by Japan Student Services Organization (JASSO): 2015–2016

Prizes

- Poster prize (Bachelor’s project evaluation): 2017

Publications

1. **Ishigohoka, J.**, Bascón-Cardozo, K., Bours, A., Fuß, J., Rhie, A., Mountcastle, J., Haase, B., Chow, W., Collins, J., Howe, K., Uliano-Silva, M., Fedrigo, O., Jarvis, E.D., Pérez-Tris, J., Illera, J.C., and Liedvogel, M. (2021). Recombination suppression and selection affect local ancestries in genomes of a migratory songbird. *bioRxiv*
2. Delmore, K., Illera, J.C., Pérez-Tris, J., Segelbacher, G., Ramos, J.S.L., Durieux, G., **Ishigohoka, J.**, and Liedvogel, M. (2020). The evolutionary history and genomics of European blackcap migration. *ELife* 9, e54462.
3. Yamaguchi, S., Hayase, S., Aoki, N., Takehara, A., **Ishigohoka, J.**, Matsushima, T., Wada, K., and Homma, K.J. (2017). Sex Differences in Brain Thyroid Hormone Levels during Early Post-Hatching Development in Zebra Finch (*Taeniopygia guttata*). *PLOS ONE* 12, e0169643.

Communications

- **Poster presentation**, “High recombination rates affect demography inference”, Gordon Research Conference for Speciation, Renaissance Tuscany Il Ciocco, Italy, 29.01-03.02.2023
- **Poster presentation**, “Genetic similarity is deviated from population structure at population-specific and species-wide low-recombining regions”, Gordon Research Seminar for Speciation, Renaissance Tuscany Il Ciocco, Italy, 28-29.01.2023
- **Poster presentation**, “How recombination rates affect demography inference”, The 56th Annual Meeting of Population Genetics Group, London, UK, 04-06.01.2023
- **Poster presentation**, “Demography inference to understand behavioural divergence in a migratory songbird blackcap”, The 24th Annual Meeting of Society for Evolutionary Studies, Numazu, Japan, 04-07.08.2022 (Numazu, Japan)
- **Poster presentation**, “To understand bird migration through brain cell type-specific chromatin accessibility”, EMBL Conference Chromatin and Epigenetics, 18.07.2021 (Heidelberg, Germany. Online conference)
- Internal events and unofficial seminars
 - **Poster presentation**, “Genome-wide genealogy to understand evolution of seasonal migration in blackcaps”, annual internal meeting at MPI Evolutionary Biology, 09-10.06.2022 (Plön, Germany)
 - **Seminar**, “Recombination suppression and selection affect local ancestries in genomes of a migratory songbird”, Department of Evolutionary Genetics, MPI Evolutionary Biology, 29.10.2021 (Plön, Germany)
 - **Poster presentation**, “To understand bird migration through brain cell type-specific chromatin accessibility”, IMPRS evaluation, 02.07.2021 (Plön, Germany. Online meeting)
 - **Oral presentation**, “Convergent polymorphic inversions in songbird genomes”, annual internal meeting at MPI Evolutionary Biology, 17.06.2021 (Plön, Germany. Online meeting)
 - **Oral presentation**, “Behavioural divergence of avian migration at a brain cell-type level”, presented at annual meeting with the Scientific Advisory Board for Institute for Avian Research, 10.03.2021 (Wilhelmshaven, Germany. Online meeting)
 - **Poster presentation & oral presentation**, “Population genomics of seasonal migration in blackcaps”, annual internal meeting at MPI Evolutionary Biology, 19.06.2020 (Online meeting)
 - **Oral presentation**, “Inversion polymorphisms and bird migration”, Mini-symposium for bird migration, 27.02.2020 (Plön, Germany)
 - **Seminar**, “Inversion polymorphisms and bird migration”, 03.02.2020 (Max Planck Institute for Ornithology, Seewiesen, Germany)

Courses and workshops

- Guarda summer school for evolutionary biology. 18-24.06.2022 (Guarda, Switzerland)
- Guarda summer school for evolutionary biology. 20-27.06.2020 (Accepted but cancelled due to corona)
- Workshop on population and speciation genomics. 19.01-01.02.2020 (Český Krumlov, Czech Republic)