



16th CDE international seminar (online)

Nov 26th (Fri), 18:00-19:00 (Japan time) [Lang: English]

Dr. Yi-Jyun Luo

Department of Zoology, University of Oxford, UK

<https://www.biology.ox.ac.uk/people/dr-yi-jyun-luo/#/>

Single-cell profiling of animal cell states and the evolution of bilaterian cell types

Click this URL for registration (free event)

<https://forms.gle/4i4W7ucYBJJDscuNA>

(Zoom URL will be sent to you based on the registered information)

- Abstract -

Animals capable of whole-body regeneration contain a large population of pluripotent stem cells that are able to differentiate into any missing cell type. However, the molecular control and evolutionary origin of this cell type are poorly understood. Here we apply single-cell RNA sequencing to profile the transcriptional states of juvenile and adult cells in the regenerative acoel worm *Hofstenia miamia*. We identify eight major cell types shared across juvenile and adult stages, including neural, epidermal, muscle, digestive, and pluripotent stem cells, reflecting all basic cell types in bilaterians. Comparative transcriptomic analysis reveals three conserved cell types (i.e., neural, muscle, and digestive) among bilaterians, indicating a possible single origin of these basic cell types. By reconstructing cell lineage, we discover that juvenile and adult pluripotent stem cells have distinct transcriptional states and different population dynamics. Furthermore, perturbation of transcription factors expressed in the progenitor and differentiated cells with RNA interference reveals a conserved role of transcriptional gene regulation in bilaterian cell types. Our study uncovers juvenile and adult cell type diversity and provides insights into the evolution of bilaterian cell types.

進化にご興味のある全ての皆様へ

新学術領域「進化制約方向性（倉谷代表）」公開オンラインセミナーのお知らせです。表現型進化の方向性、拘束、進化可能性といった概念や問題について、考え、議論したり新たな考えや人の相互作用をもたらすための不定期で行う国際オンラインセミナーです（公開。参加費無料）。フランクなオンラインミーティングです。大学院生の方々も広くご参加いただけましたら幸いです。近くに興味を持たれそうな方がおられましたらお声がけいただけると幸いです。

For all of you who are interested in Evolutionary Biology

We are happy to announce open, online international seminar provided by the research project "Constrained and Directional Evolution" (led by Dr. Shigeru Kuratani).

The aim of this open seminar is to share and discuss over the challenging topics in evolutionary biology, such as Evolvability, Constraints, Directionality in phenotypic evolution etc., and to boost interactions between scientists interested in these topics. It's an open seminar with participation free of charge, and we welcome your participation (Students, Postdocs, Pls etc.)

[Greeting from the chair of this project]

How much has our understanding of biological evolution improved in the past half century? Not even the shape of the tiny insect in front of us now can be satisfactorily explained. My understanding of evolution has not changed much since then. I do not think it's the way it should be. It's good enough. At last, it's time we start doing something to solve the mystery.

Why should the shapes of plants and animals be the way they are? How does purposefulness explain the process of these refinement of shapes? This project aims to construct a new theoretical system of evolutionary biology by not only encompassing natural selection and neutral theories but also integrating essential elements that previous theories failed to address. We hope that this attempt will provide a place for gathering bold challengers, and further leads to a new trend in the field of evolutionary biology.

<http://constrained-evo.org/greeting.html>

[領域代表より、挨拶] (原文はHPをご覧ください)

過去半世紀の間、生物の進化についての私たちの理解はどれほど深まったのだろうか。いま目の前にいるちっぽけな虫のかたちすら満足に説明してくれない。進化に関する私の理解はあの頃とあまり変わってはいない。さりとして、このままでよいとも思わない。いよいよ謎を解くべく、何かを始めなければならない。動植物のかたちがなぜこのようなものでなければならないのか、そしてそれが洗練されて行く過程にどのように目的性が入り込むのか、自然選択説や中立説を包含するのみならず、それらが扱うことのできなかった本質的要素を統合することを通じ、本領域は進化生物学の新たな理論体系の構築を目標とする。この試み自体、進化生物学領域における梁山泊であり、自ら新たな潮流となり、進化研究を変える第一歩ならんと欲するものである。

<http://constrained-evo.org/greeting.html>