Evolutionary Theory for
CONSTRAINED & DIRECTIONAL EVOLUTION

http://constrained-evo.org

Grant-in-Aid for Scientific Research on Innovative Areas

新学術領域　進化の制約と方向性

15th CDE international seminar (online)

Nov 19th (Fri), 10:00-11:00 am (Japan time) [Lang: English]

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https://cumming.ucalgary.ca/node/18450

The Developmental Basis for Evolvability

Click this URL for registration (free event)
https://forms.gle/UYvhHmqUErFs5qo39
(Zoom URL will be sent to you based on the registered information)

- Abstract -

The developmental basis for evolvability is the central concern of evolutionary developmental biology (Hendrikse, Parsons, and Hallgrimsson 2007). This is because the ways in which development structures the generation of phenotypic variation can influence evolution at both micro- and macroevolutionary scales. Despite long-standing interest in the question of how development structures phenotypic variation, general insights have been slow to emerge, largely because the mechanistic basis for quantitative variation has not been a strong focus for developmental biology. Building on work on the developmental genetics of quantitative variation in the morphology of the vertebrate face, we argue for three central insights that relate development to evolutionary change: 1) That genetic influences on phenotypic variation are often highly non-linear. 2) That despite the high dimensionality of both phenotypic and genomic variation, the two are often linked by latent factors that capture the influence of variation-determining developmental processes that drive axes of integrated phenotypic variation. 3) Developmental systems tend to exhibit stochastic metastability that creates both robustness and the potential for discontinuous change. Taken together, these insights have important implications for the developmental basis for evolvability including the long-standing issue of the dynamics of continuous versus discontinuous evolutionary change.

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, PIs 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、抜粋]（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合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論む。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。
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