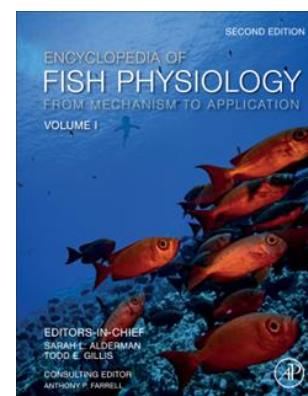


# Encyclopedia of Fish Physiology, 2nd Edition

## 魚類生理學百科全書, 第二版

*This comprehensive and accessible work provides a broad collection of topics ranging from how fish survive in extreme environments to using fish as models for biomedical research.*

《魚類生理學百科全書》第二版是一本綜合性的入門參考書，旨在讓讀者了解這一學科的奇蹟。各章重點介紹了脊椎動物群體中生理系統和過程的保守性，這支持使用魚類作為脊椎動物模型來研究生理學的基本問題以及向醫學領域的知識轉移。其他章節重點介紹了魚類獨特的特化和適應能力，使它們能夠在充滿挑戰的環境中生存，從而對自然世界有更深入的了解。最後部分展示了擾亂生理系統的後果，以及這些知識如何支持保護魚類的保護策略。



自從上一版散文獎獲獎版出版以來，魚類生理學領域已經發生了很大變化。例如，我們更了解了全球氣候變遷對魚類生理系統的影響，並且透過 CRISPR 基因編輯、全基因組定序和定量「組學」方法等技術進步，我們對生理過程有了更深入的理解。新版本大大擴展了結尾主題部分，專注於將魚類生理學應用於現實世界的挑戰，包括海洋酸化、由人類活動導致的棲息地品質下降，以及斑馬魚在組織再生、神經系統疾病和癌症的生物醫學研究中的應用。

### Key features/ benefits

- Comprehensive single resource on fish physiology that covers a diverse range of topics to educate and fascinate.
- Written by leading experts in the field, offering topical overviews with a suggested reading list for those wanting to learn more.
- Structured, accessible chapters include graphical and bulleted summaries that can be used as teaching material.
- All chapters follow a set template, making the work consistent and easy to navigate.
- 關於魚類生理學的綜合性單一資源，涵蓋各種主題，具有教育意義和吸引力
- 由該領域的領先專家撰寫，為想要了解更多資訊的人提供主題概述和建議閱讀列表
- 結構化、易理解的章節包括可用作教材的圖形和項目符號摘要
- 所有章節都遵循一個固定的模板，使工作保持一致且易於瀏覽

## What problem does this MRW solve?

Not many resources are available to link the basic understanding of fish physiology with how they interact and adapt to the world, and explain the relationship between fish and humans, whereby we can use the fish study results to benefit human health. This work is unique in bridging that gap and serving a growing scientific community.

## Meet the Editors-in-Chief

- Editors-in-Chief: Sarah L. Alderman, Department of Integrative Biology, University of Guelph, Canada; Todd E. Gillis, Professor of Comparative Physiology, University of Guelph, Canada.  
Consulting Editor: Anthony Farrell, University of British Columbia, Canada.
- Plus an international and highly qualified editorial board: Michael G. Jonz, Nicholas Bernier, Katherine Sloman, Glen Van Der Kraak, Pung Pung Hwang, Katja Antilla, Carol Bucking, Emily Standen, Douglas Fudge, Anne Todgham, Andrew J. Esbaugh, Jodie Rummer.

## Important Areas of Coverage:

- Sensing the Environment
- Endocrine and Immune Systems
- Behavioural Physiology
- Reproduction and Development/Reproductive Physiology
- Gas Exchange and Ion Homeostasis
- Heart, Vasculature, and Blood
- Energy Homeostasis
- Muscles and Movement
- Responses and Adaptations to the Environment
- Applications of Fish Physiology
- Biomechanics and Bioinspired Design
- Physiological Specializations of Different Fish Groups



### New or substantially revised areas in this edition include:

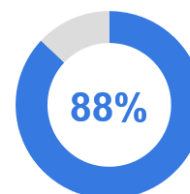
- Fish physiology and real-world challenges: climate change, ocean acidification, declining habitats.
- Applications for biomedical studies on tissue regeneration, neurological disorders and cancer.
- New discoveries linked to technological advancements such as gene editing with CRISPR, whole genome sequencing and quantitative 'omic` approaches.



**217**  
Chapters



**>350**  
Authors/  
contributors



new or revised  
articles

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*Reference Collection: Life Sciences*

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