

Early-Career Investigator
Research Achievement Award
年輕學者研究成果獎

2023 ACADEMIA SINICA
EARLY-CAREER INVESTIGATOR
RESEARCH ACHIEVEMENT AWARD

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代表著作：

- 📖 Chan KY, Yan CCS, Roan HY, Hsu SC, Tseng TL, Hsiao CD, Hsu CP, (Chen CH)*. “Skin Cells Undergo Asynthetic Fission to Expand Body Surfaces in Zebrafish” *Nature*. 2022:605(7908):119-125.
- 📖 Tseng TL, Wang TY, Tsao CY, Ke YT, Lee YC, Hsu HJ, Poss KD, (Chen CH)*. “The RNA Helicase Ddx52 Functions as a Growth Switch in Juvenile Zebrafish” *Development*. 2021:148(15):dev199578.
- 📖 Wang TY, Tseng TL, Kuo YC, Yu JK, Su YH, Poss KD, (Chen CH)*. “Genetic Reprogramming of Positional Memory in a Regenerating Appendage” *Current Biology*. 2019:29(24):4193-4207.e4.

簡評：

生物學長久以來的定論是細胞分裂只有減數分裂和有絲分裂兩種，陳博士以自行研發的活體螢光標定技術結合跨領域數學模型推導，發現第三種分裂方式：體細胞可在沒有 DNA 合成下進行分裂，此乃可成為教科書教材的創新發現。

簡歷：

陳振輝畢業於國立陽明大學醫技系及生化所，在美國達特茅斯學院拿到博士學位、杜克大學進行博士後研究。他在 2016 年 7 月加入中央研究院細胞與個體生物學研究所（細生所），至今曾獲國科會傑出研究獎、EMBO 全球研究學者、伍焜玉院士學術講座學者等獎項的肯定。其研究團隊致力於探討脊椎動物的再生反應。他們利用斑馬魚作為模式生物，開發新型的多顏色細胞標誌工具和影像平台，並結合大尺度、多維度的細胞行為分析和遺傳學方法，專注在從個體的角度系統性地解構再生反應的細胞和分子機制。實驗室的長期目標是發展、應用其基礎研究的成果，增強人類組織和器官的再生能力。

Chen-Hui Chen graduated from National Yang Ming University with a bachelor degree in Medical Technology and a master degree in Biochemistry. He obtained his Ph.D. from Dartmouth College in the United States and conducted postdoctoral research at Duke University. In July 2016, he set up his own laboratory within the Institute of Cellular and Organismic Biology (ICOB) at Academia Sinica. To date, he has received recognition for his research, including the NSTC Outstanding Research Award, EMBO Global Investigator, and Kenneth K. Wu Lecture Scholar. His research team is dedicated to exploring the regenerative responses in vertebrate animals. They use zebrafish as a model

organism, develop multicolor cell labeling tools and imaging platforms, and integrate them with large-scale, multidimensional analysis of cell behavior and genetic approaches. Their focus is on systematically dissecting the cellular and molecular mechanisms of regenerative responses from an individual perspective. The long-term goal of the lab is to translate the results of their basic research into practical applications, thereby enhancing the regenerative potential of human tissues and organs.

代表作簡介：

細胞分裂的發生構成了地球上所有生命的基礎。生物個體的發育、生長、繁殖、老化、再生、甚至癌症的起因，都跟細胞分裂密切相關。除了「有絲分裂」和「減數分裂」之外，在斑馬魚發育過程中，我們意外發現了一種獨特的細胞分裂方式。在這種分裂過程中，單一母細胞可以分裂 2 次，最多產生 4 個子細胞，而這個分裂過程竟可以在不進行遺傳物質複製的情況下發生。因此，我們將此一細胞分裂方式命名為「無合成分裂」。

The occurrence of cell division forms the basis of all lives on earth. The development, growth, reproduction, aging, regeneration, and even the onset of cancer in living organisms are all intricately linked to cell division. In addition to "mitosis" and "meiosis," we stumbled upon a distinctive type of cell division during zebrafish development. In this division process, a single parent cell can undergo two rounds of cell division, resulting in the production of up to four progeny cells. Remarkably, this division readily occurs without the need for DNA replication. Thus, we have termed the process "asynthetic fission" (Chan et al., *Nature* 2022; PMID: 35477758).

得獎感言：

感謝家人、研究團隊、合作夥伴、細生所以及中研院的同仁，在各個層面上給予我的全力支持。每一天都很感恩，真的是非常幸運，可以在有限的人生裡，盡己所能、專注在自己覺得有趣的研究主題。

Many thanks to my family, research team, collaborators, colleagues at the Institute of Cellular and Organismic Biology, and the Academia Sinica for providing me with their wholehearted support on various levels. I am grateful every day and feel incredibly fortunate to be able to, in this limited lifetime, give my all and focus on research topics that I find interesting.