

陶謙

QIAN TAO



Principal Investigator

Qian Tao



Team members

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Research Progress Summary

Qian Tao and his research team work on the epigenomic alterations of cancers and identify novel TSGs epigenetically inactivated. The team studies the epigenetic disruption of cell signalling regulation via silencing signalling TSGs by promoter CpG methylation in tumorigenesis. One important aspect is Epstein-Bar virus (EBV)-induced aberrant epigenetic programming in EBV-associated tumours including NPC. Despite the findings from extensive whole-genome sequencing studies, CpG methylation-related gene silencing remains the most common genetic alteration detected in NPC, while epigenomic studies have led to the identification of a series of cancer genes frequently methylated in NPC. These genes include regulators of cell signalling and epigenetic modifiers, supporting that viral-induced epigenetic abnormalities have a key role in NPC pathogenesis.

The team previously identified a novel epigenetically disrupted gene *ZDHHC1* functioning as a tumour suppressor in multiple malignancies. They further found that *ZDHHC1* protein is an S-palmitoyltransferase and p53 as a substrate for *ZDHHC1*-mediated palmitoylation. This novel form of posttranslational modification of p53 is required for its nuclear translocation. Thus, the epigenetic feedback loop formed by *ZDHHC1* and p53 sheds light on the inactivation of p53 without genetic mutations. In another study, they identified *ZBTB28* as a tumour suppressor gene by inducing autophagy-related apoptosis in cervical cancer. *ZBTB28* promoter methylation could be a biomarker for cervical cancer screening. Meanwhile, the team also identified the epigenetic disruption of TSG promoter methylation as potential epigenetic biomarkers for cancer diagnosis, including TET1 methylation which got a US patent recently.

04 ASIAN CANCERS

Cancer Epigenetics

Research and Scholarship

Academic Editorship

Member's Name	Details	
	Role	Journal
Qian Tao	Vice-President	The Epigenetics Society
	Editorial Board Member	Clinical Epigenetics
		Epigenomes
		PLoS One
		Cancer Communications
		Epigenetic Diagnosis & Therapy
		Microorganisms
		Journal of Clinical Epigenetics
	Panel member and Reviewer	China State Natural Science Award (Ministry of Science and Technology)
		National Natural Science Foundation of China
	Reviewer	Worldwide Cancer Research, USA (American Institute for Cancer Research)
		Singapore Academic Research Council, Ministry of Education, Singapore
		Foundation for Polish Science, Poland
		Multi-Year Research Grant, University of Macau, Macau
		Health and Medical Research Fund, Food and Health Bureau, Hong Kong
		Children's Cancer and Leukaemia Group, UK
		Tencent XPLOERER Prize
		Guangdong Science and Technology Department
		Faculty Promotion Committee of Cancer Hospital/ State Key Laboratory of Oncology in South China, Sun Yat-sen University, Guangdong, China
		Advisor Committee
	Basic Research in Shenzhen	
Academic Advisor	State Key Laboratory of Oncology in South China, Sun Yat-sen University Cancer Hospital, Guangdong, China	
	Key Laboratory of Biotherapy of Zhejiang Province, Zhejiang University, China	
	Key Laboratory of Ministry of Education, Cancer Research Institute, Central South University, Hunan, China	

Member's Name	Details	
	Role	Journal
Qian Tao	Overseas Board Member	Oncology Section/China Association of Pathophysiology
	Visiting Chair Professor	National Research Center for Urologic Oncology of China/Beijing, Peking University 1 st Hospital & Institute of Urology, Beijing, China
		State Key Laboratory of Oncology in South China, The Cancer Institute, Sun Yat-sen University and SYSU Affiliated Zhongshan Hospital, Guangdong, China
		Hunan Yale (XiangYa) School of Medicine, Central South University, Changsha, China

Reviewer of Journal / Conference

Member's Name	Details	
	Role	Journal / Conference
Qian Tao	Reviewer	Nature Communications
		Blood
		Cancer Research
		Lancet
		Cell Death & Differentiation
		The Journal of Pathology
		Oncogene
		Nucleic Acids Research
		Epigenetics
		Clinical Epigenetics
		Advanced Science
	Organising Committee	6 th Conference of Epigenetics and Biomedicine, Shenzhen, China

Grants and Consultancy

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK\$)
Qian Tao	Regulation of Tumor Cell Invasion/ Metastasis and EMT/ Stemness by a New Ras Antagonist which is Silenced by CpG Methylation in Esophageal Cancer	Research Grants Council – General Research Fund	01/01/2019	30/06/2021	929,280
	Mechanism of Inflammasome Activation by SARS-CoV-2	Research Grants Council – Collaborative Research Fund	01/06/2021	31/05/2024	8,431,247

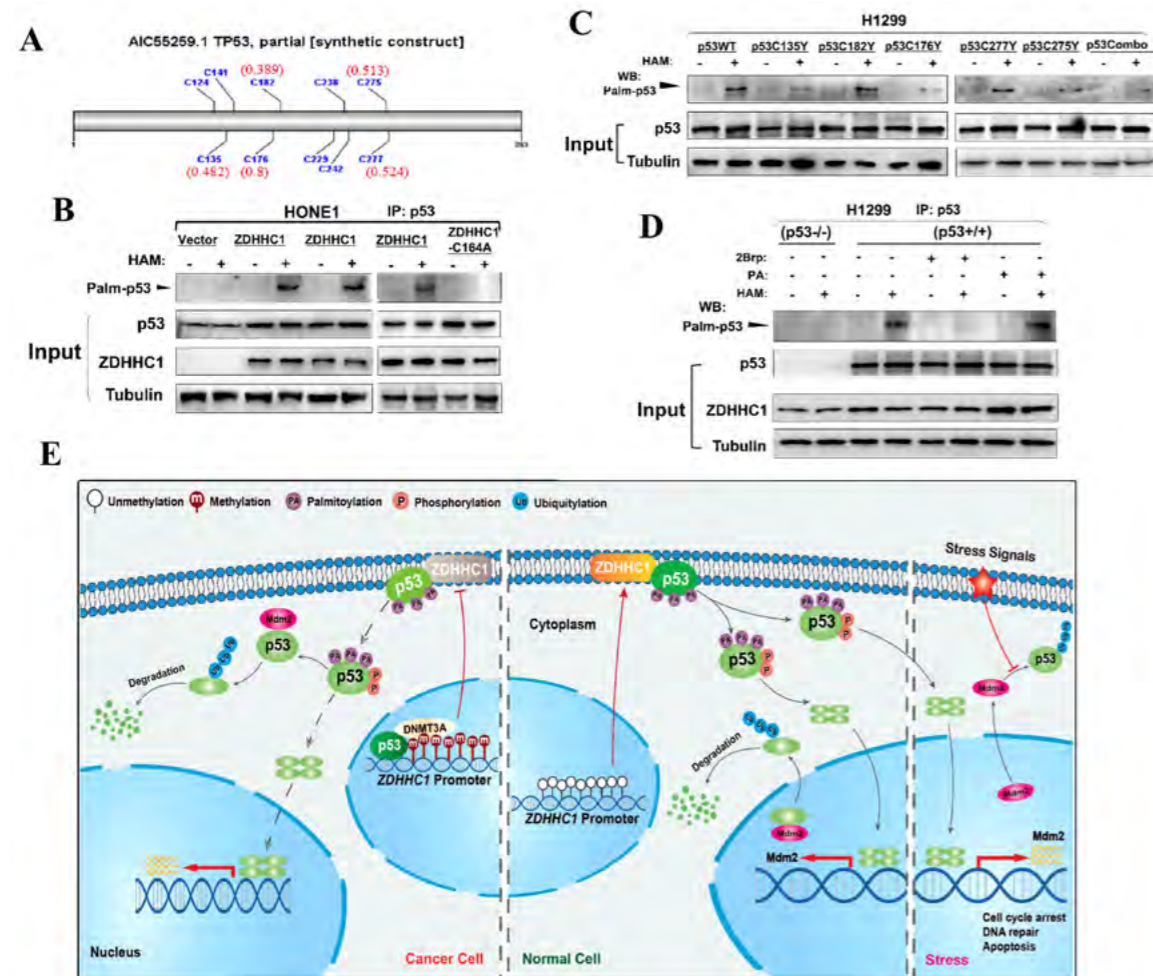
Publications

A. Journal Papers

1. Tang J, Peng W, Feng Y, Le X, Wang K, Xiang Q, Li L, Wang Y, Xu C, Mu J, Xu K, Ji P, Tao Q, Huang A, Deng CX, Lin Y, Xiang T. Cancer cells escape p53's tumor suppression through ablation of ZDHHC1-mediated p53 palmitoylation. *Oncogene*. 2021;40(35):5416-5426. doi:10.1038/s41388-021-01949-5.
2. Li L, Gong Y, Xu K, Chen W, Xia J, Cheng Z, Li L, Yu R, Mu J, Le X, Xiang Q, Peng W, Tang J, Xiang T. ZBTB28 induces autophagy by regulation of FIP200 and Bcl-XL facilitating cervical cancer cell apoptosis. *Journal of Experimental and Clinical Cancer Research*. 2021;40(1). doi:10.1186/s13046-021-01948-0.

B. Patents

1. Tao Q, Li L. Tumor Suppressor TET1 and Uses Thereof. United States of America, US20190167708.



The epigenetic regulatory loop formed by ZDHHC1, p53, and DNMT3A.

Source: Qian Tao

