

Publication(s) of the week

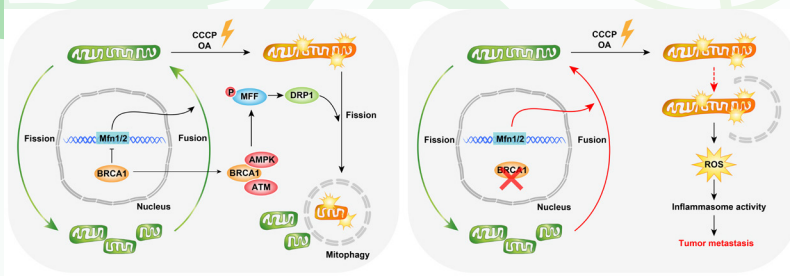
1. **Chen, Q.**, Lei, J. H. P., Bao, J. L., Wang, H. T., Hao, W. H., Li, L., Peng, C., Masuda, T., **Miao, K.**, Xu, J., **Xu, X. L.**, and **Deng, C. X.** (2020) BRCA1 Deficiency Impairs Mitophagy and Promotes Inflammasome Activation and Mammary Tumor Metastasis. *Adv Sci*, 1903616 [2018 IF=15.804]
2. Jia, H., Song, Y., Huang, B., **Ge, W.**, and **Luo, K. Q.** (2020) Engineered Sensor Zebrafish for Fast Detection and Real-Time Tracking of Apoptosis at Single-Cell Resolution in Live Animals. *ACS Sens* [5yr IF=6.95]
3. Li, J., and **Ge, W.** (2020) Zebrafish as a Model for Studying Ovarian Development: Recent Advances from Targeted Gene Knockout Studies. *Mol Cell Endocrinol*, 110778 [5yr IF=3.831]
4. Xie, S., Li, B., Lyu, P., **Kwok, H. F.**, Ge, L., and Wu, Q. (2020) A New Voltammetric Immunosensing Platform for Prostate-Specific Antigen Based on the Cu(li)-Pyrophosphate Ion Chelation Reaction. *New J Chem* **44**, 3820-3823 [2018 IF=3.069]

ARTICLES SHARING

New Mechanism to Block Recurrence and Metastasis of Breast Cancer – Prof. Chuxia DENG and Dr. Qiang CHEN

Prof. Chuxia DENG and Dr. Qiang CHEN together with Prof. Xiaoling XU recently found that breast cancer susceptibility gene 1 (BRCA1) plays an important role in regulating mitophagy and mitochondrial dynamics: it maintains a healthy mitochondrial network and reduces inflammasome activity, which blocks the recurrence and metastasis of breast cancer after surgery. The research study was sponsored by the National Natural Science Foundation of China, UM, and the Macao Science and Technology Development Fund. It has been published as a cover article in the well-known international journal Advanced Science titled “BRCA1 Deficiency Impairs Mitophagy and Promotes Inflammasome Activation and Mammary Tumor Metastasis”.

According to statistics from GLOBOCAN, a project of the International Agency for Research on Cancer, there were about 18.1 million new cancer cases worldwide in 2018, with 9.6 million deaths. Among these cases, 2.1 million were female breast cancer cases, with 630,000 resulting in death. The most common cancer in women, breast cancer is classified into six main intrinsic subtypes based on the genes a cancer expresses. Triple negative breast cancer (TNBC) is cancer that does not express the genes for estrogen receptor, progesterone receptor, and human epidermal growth factor receptor 2, which represents 10.0 to 20.8 % of all breast cancers. Because of the lack of specific therapeutic targets, TNBC is the most malignant and lethal, making it extremely urgent to find novel and effective targets for TNBC treatment.

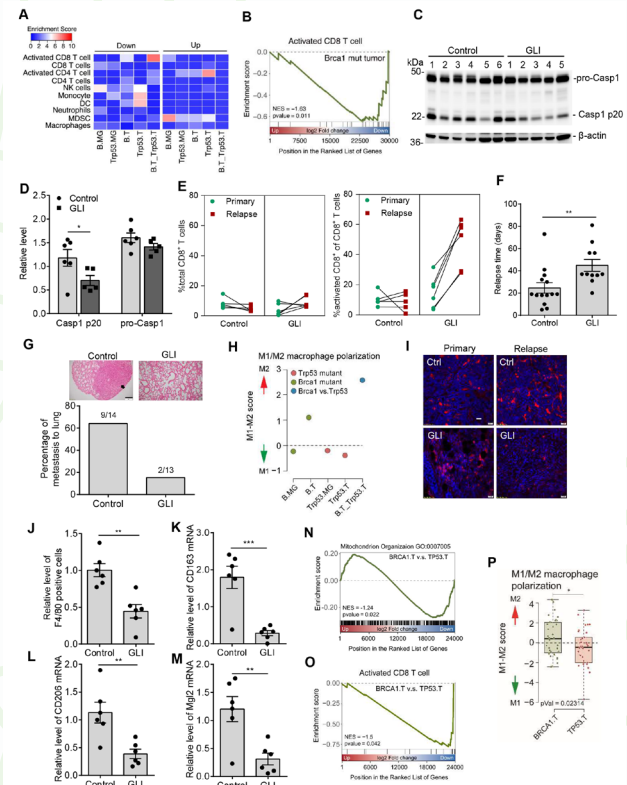


Schematic model for this study

BRCA1 is a major tumour suppressor gene and plays a critical role in maintaining genomic stability. BRCA1 mutation is the most common cause of hereditary breast cancer, and women with BRCA1 mutation have an increased risk of developing breast cancer, most of which are TNBC. Prof. DENG’s team conducted a study using a BRCA1 mammary-specific

knockout mice model, and found that BRCA1 plays an important role in regulating mitophagy and mitochondrial dynamics: it maintains a healthy mitochondrial network and reduces inflammasome activity, which blocks recurrence and metastasis of breast cancer after surgery.

Mitochondrion is a double-membrane organelle found in most eukaryotic organisms. Mitochondria as dynamic organelles are constantly undergoing fission and fusion, which are essential for maintaining mitochondrial network. Mitochondrion is not only the power plant of cells, but also plays an important role in cell signal transduction and cell death. Therefore, maintaining healthy mitochondria is vital to cellular health. Recent studies have shown that mitophagy is the selective degradation of mitochondria by autophagy, which is crucial for maintaining mitochondrial function and cellular integrity. This study indicates that BRCA1 has dual roles in regulating mitochondrial dynamics. In nucleus, BRCA1 negatively regulates key components of mitochondrial fusion machinery such as mitofusin 1/2. In cytoplasm, BRCA1 translocates to the outer membrane of mitochondria and promotes fission and mitophagy after mitochondrial damage. Unbalanced mitochondrial dynamics leads to elongated mitochondria and prevents isolating damaged organelles from healthy mitochondrial network in BRCA1 mutant cells. It further demonstrates that BRCA1 deficiency leads to defective mitophagy, accumulates damaged mitochondria, and increases reactive oxygen species in mammary cells, thereby causing excessive inflammasome activation to establish tumour-associated microenvironment for recurrence and metastasis. This suggests that inflammasome inhibition could serve as a therapeutic target for the treatment of BRCA1-associated breast cancer.

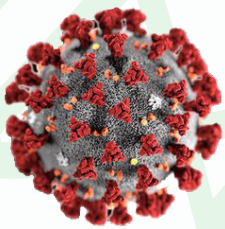


BRCA1 is required for stress-induced mitophagy

For details about the paper, please visit:
<https://onlinelibrary.wiley.com/doi/10.1002/adv.201903616>



Promote Mental Health Services during the COVID-19 Outbreak – Prof. Yitao XIANG



The novel coronavirus disease (COVID-19) outbreak, which is believed to start at the end of the 2019 in Wuhan, Hubei, has aroused intensive attention globally. Due to the rapidly increasing numbers of infected cases and deaths, patients, health workers, and the public are all under great pressure. However, mental health services for the COVID-19 epidemic had been under-addressed at the early stage of the outbreak. Under such circumstance, the research team on mental health led by Prof. Yutao XIANG has first released the call for timely mental health care for patients, health workers and the public who are in need. Four relevant articles have been published in prestigious medical journals, including the *Lancet* and the *Lancet Psychiatry*. The 5-year impact factors of these journals are 54.66 and 17.64, respectively.

The first article entitled “Timely mental health care for the 2019-nCoV outbreak is urgently needed” was published on the *Lancet Psychiatry* on 4 February 2020. This article pointed out that since the outbreak of the disease, both patients and health professionals are vulnerable to mental

health problems, such as fear, anxiety, depression, insomnia, frustration and feelings of isolation. Thus, timely mental health care should be provided for patients with the COVID-19 pneumonitis, close contacts and suspected cases who are isolated at home, patients in fever clinics, families and friends who are affected, health professionals caring for infected patients and the public who are in need. It is believed that the development and implementation of systematical mental health assessment, support, treatment and services are critical and pressing goals for mental health response to the COVID-19 pneumonia.

With the growing awareness of timely mental health services, Chinese health authorities and academic societies started to develop relevant expert consensus and guidelines for crisis mental health services, such as the “Principles for emergency psychological crisis intervention for 2019-nCoV pneumonia Epidemic” released by the National Health Commission of China. However, the fast transmission of the COVID-19 hinders traditional face-to-face psychological interventions. In contrast, online mental health services is flexible and safe. Therefore, on 18 February 2020, Prof. XIANG’s team, together with the collaborators in Guangzhou, published the second article entitled “Online mental health services in China during the COVID-19 outbreak” in the *Lancet Psychiatry*. This article summarized online mental health services in China for the COVID-19 outbreak: 1) online mental health surveys, 2) online mental health education, and 3) online psychological counselling and psychotherapy services. The authors concluded that the online mental health services used for the 2019-nCoV epidemic could facilitate the emergency mental health interventions.

Prof. XIANG’s team noticed that of the deaths caused by the COVID-19, more than 80% were the elderly. Along with the fact that China has the largest aging population globally. There were 241 million senior citizens (age>60 years) nationwide in 2017, accounting for 17.3% of the total population in China. The rapid transmission of the COVID-19 and high death rate in older patients could exacerbate the risk of mental health problems and worsen their existing psychiatric symptoms, which further impair their daily functioning and cognition. In addition, due to limited access to internet services and smart phones, only a small fraction of senior citizens could benefit from the online mental health service provision. In order to gain adequate attention to this vulnerable population in the recently established crisis psychological services in China, Prof Xiang’s team published the third article entitled “Mental health services for older adults in China during the COVID-19 outbreak” on 18 February 2020. This article pointed out that the outbreak of COVID-19 has raised great challenges for mental health services for older adults. Sufficient and adequate attention should be paid to this vulnerable population. Stakeholders and health policymakers should collaborate together to resolve this barrier to provide high quality crisis psychological services for community-dwellings older adults in a timely fashion.

The fourth article entitled “Timely research papers about COVID-19 in China” was published in the *Lancet* on 17 February 2020. This article addressed that since the outbreak of the COVID-19, many of the academic articles about the disease were published in English-language journals. In order to reduce language barrier, the research community should make efforts to disseminate the research findings relevant to the outbreak of COVID-19 in Chinese for frontline health-care workers who need to understand the epidemiological and clinical features of the disease.

The series of articles published by Prof. XIANG’s team suggested that the COVID-19 outbreak has raised an emerging great challenge for mental health services in China. They suggested that timely and sufficient psychological interventions should be provided for different sub-populations in need. Compared to the traditional face-to-face psychological intervention, online mental health interventions including hotline services, are more appropriate, flexible and safer during the

COVID-19 epidemic. Relevant findings about the COVID-19 should be disseminated in both English and Chinese in order to directly benefit the frontline Chinese health professionals.

For further information, please visit the following web pages:

1. [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30046-8/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30046-8/fulltext)



2. [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30077-8/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30077-8/fulltext)



3. [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30079-1/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30079-1/fulltext)



4. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30375-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30375-5/fulltext)



VIDEO SHARING

Breast Cancer Does Not Need to Cut Away – Prof. San Ming WANG



Prof. San Ming WANG has recently presented a talk titled “Breast Cancer Does Not Need to Cut Away” in the 21st Guangzhou Convention of Overseas Chinese Scholars in Science and Technology.

Prof. WANG talked about the relationship between hereditary cancer and the mutant breast cancer susceptibility gene, BRCA1 and BRCA2. He shared that mutant BRCA1 and BRCA2, which have lost the function of gene repairing, are the main reason of the normal cells become cancerous. Prof. WANG claimed that the lifetime risk of breast cancer will be 80% and the risk of ovarian cancer will be 40% when people carry a mutant BRCA gene, and they are more common after 35 years old.

Besides, Prof. WANG has mentioned his BRCA database for Chinese people. In order to detect the mutant BRCA genes earlier and to draw a clear family history of carrying the mutant BRCA genes and the different kinds of BRCA mutations, he has been building up a BRCA database for Chinese people. He found that 1 in 265 Chinese is a carrier of the mutant BRCA genes and there are over 1,600 BRCA mutations. He ensured that BRCA mutations are a major public health issue. Moreover, he has provided some suggestions to prevent the hereditary breast cancer: 1) early detection, 2) drug prevention and 3) organ removal. At the end, Prof. WANG encouraged everybody to have the genetic mutation detection of BRCA.

For the whole video, please visit: <https://v.qq.com/x/page/a3077ghjqj5.html>



March/April 2020				
Mon	Tues	Wed	Thurs	Fri
16	17	18	19	20
23	24	25	26	27
30	31	(April) 1	2	3