5 - 68 The Mechanism of SPP1 Pathway in the Immune Microenvironment of Glioblastoma

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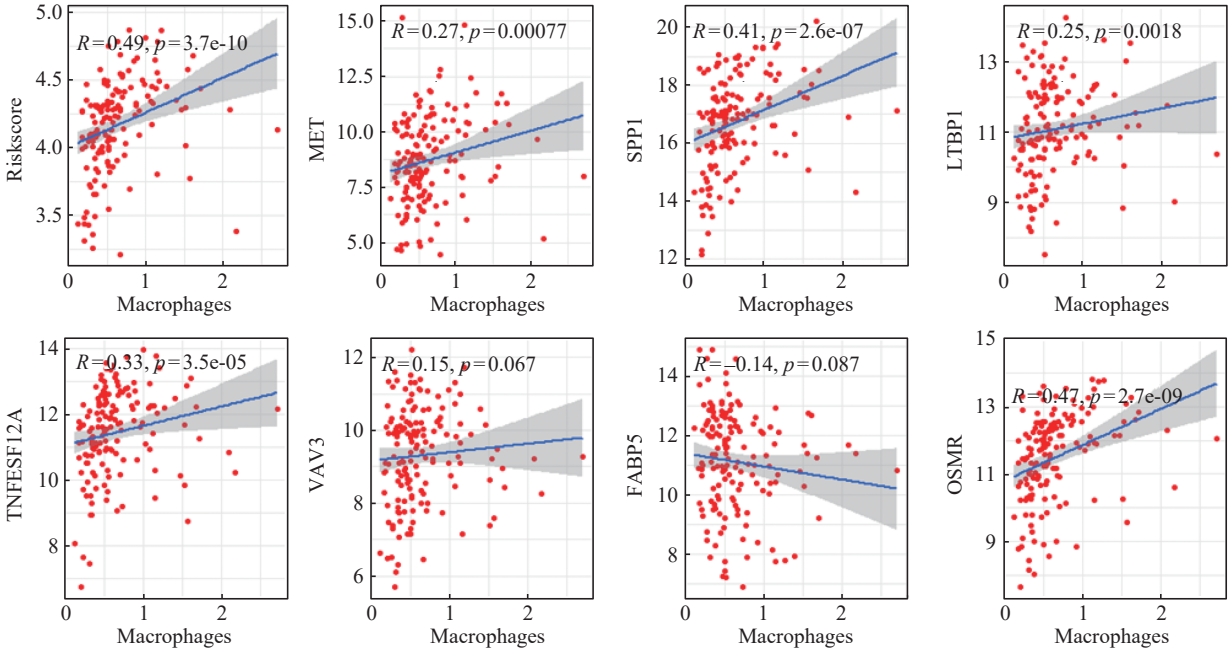
Glioblastoma (GBM) has a highly genetic heterogeneity and immunosuppressive microenvironment, leading to the inevitable emergence of treatment resistance and poor prognosis. This study aimed to explore the role of macrophages related pathways in the occurrence and development of GBM. Firstly, we developed an immune-related prognostic model and verified its ability to significantly distinguish between good and bad outcomes of patients (Fig. 1(a)). Subsequently, we analyzed the correlation of GBM immune microenvironment with the prognostic



SPP1 Peritumor signaling pathway network

SPP1 Tumor signaling pathway network

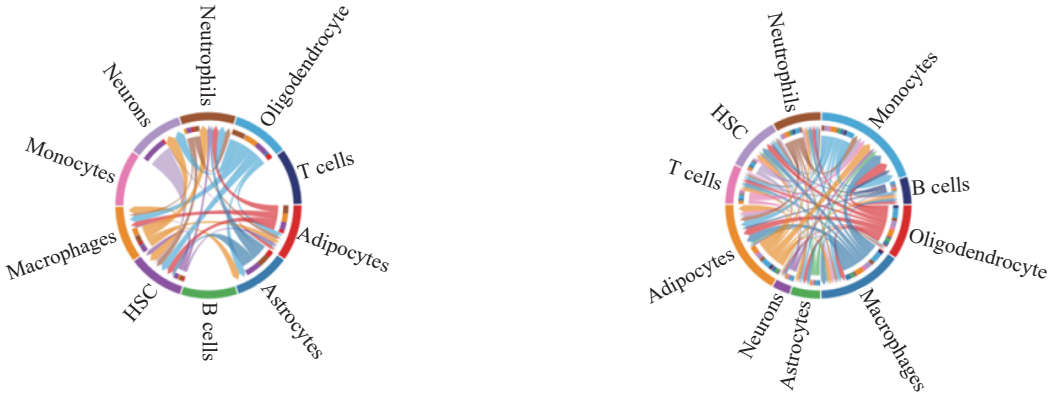


Fig. 1 (color online) Correlation between SPP1 pathway and macrophages and signal differences in different tissues.

model. It was found that there was a significant correlation between the model and the immune microenvironment, especially model gene SPP1 and macrophages. Finally, we explored the difference of SPP1 pathway between adjacent tissues and tumor tissues, and found that SPP1 pathway played an important role in tumor tissues (Fig. 1). Therefore, the mechanism of SPP1 pathway in glioblastoma can be further explored.

5 - 69 Motion Management with Respiration Guidance Gating System Verified Firstly on the Heavy-ion Therapy Facility in Lanzhou

He Pengbo, Li Qiang, Li Guangru, Zhang Xinyang, Zhang Jun and Wang Jian

In order to treat the moving targets under the synchrotron-based pulsed heavy-ion beam delivery, a novel respiration guidance gating system (RG^{2}S) was developed to synchronize the patterns between the patients' respiration and synchrotron magnetic excitation curve (MEC)[1−3].

The respiratory synchronized irradiation was realized by adding a time interval between the adjacent MECs, which was calculated based on the even sequence of synchrotron and the period of a patient specific breathing guidance curve, as shown in Fig. 1(a). A short breath-hold time was added to the end exhalation phase that was coincident with the beam extraction flattop. In this way, each beam pulse can be fully utilized while the target is in a relative static state during irradiation.

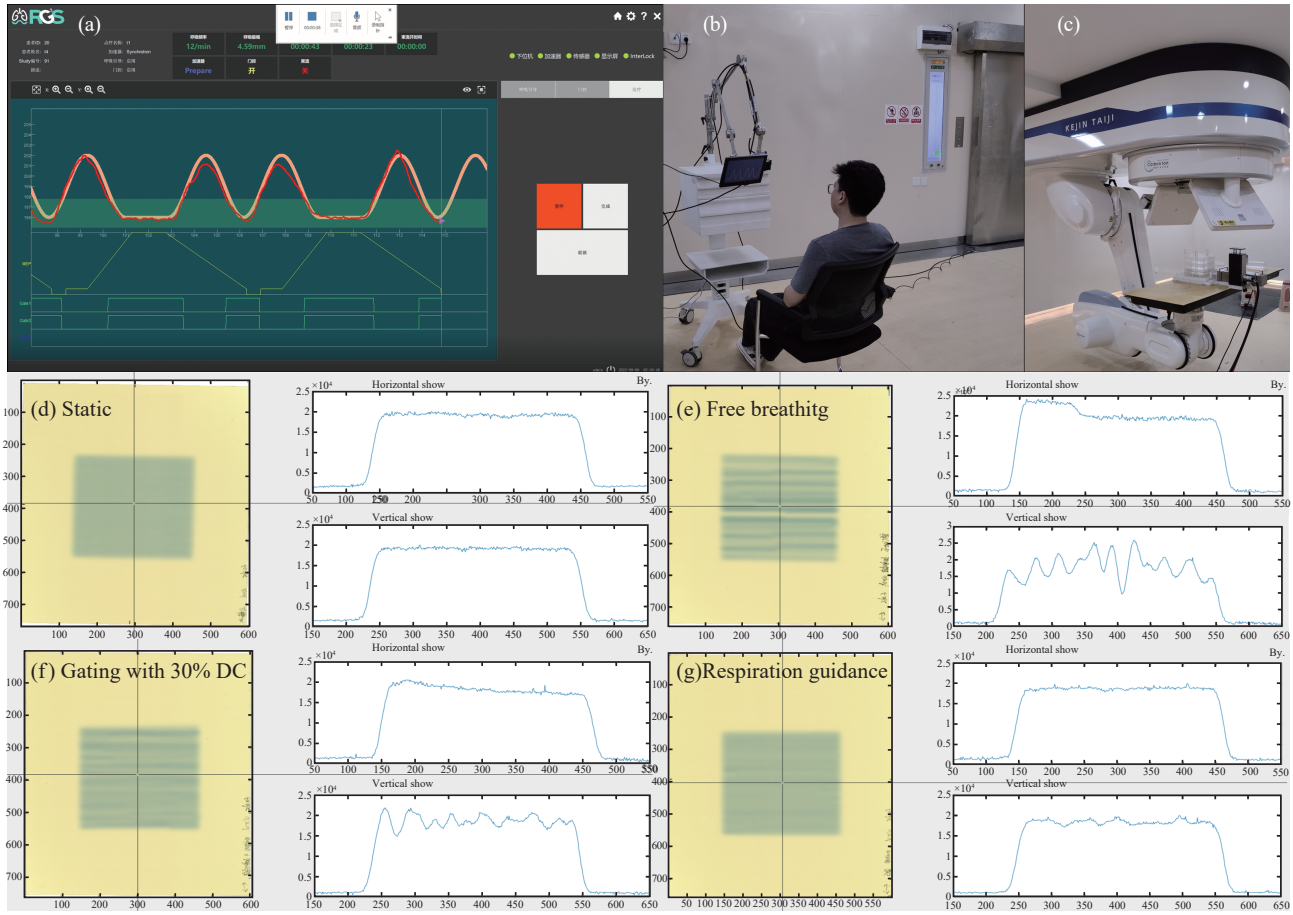


Fig. 1 (color online) (a) Synchronization between the volunteer's breathing and synchrotron magnetic excitation curve, (b) Volunteer breathing guidance test outside the treatment room, (c) Moving platform fixed in the treatment room. Measured dose distributions under, (d) Static situation, (e) Free breathing, (f) Gating with 30% duty cycle, (g) Respiration guidance.

The functionality and effectiveness of the RG^{2}S system were verified firstly on the Heavy Ion Medicine Machine (HIMM) in Lanzhou, China. A programmable portable moving platform was used to follow the volunteers' breath,