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Effect of psychosocial stress on acute-to-chronic pain transition after surgery

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Chronic postsurgical pain is a serious issue in clinical practice. After surgery, patients experience ongoing pain or become sensitive to incident, normally non-painful stimulation. The intensity and duration of postsurgical pain vary. However, it is unclear how chronic postsurgical pain develops. In this study, we showed that social defeat stress greatly prolonged plantar incision-induced pain and enhanced plantar incision-induced AMPA receptor GluA1 phosphorylation at the Ser831 site in the spinal cord. Interestingly, targeted mutation of the GluA1 phosphorylation site Ser831 significantly inhibited stress-induced prolongation of incisional pain. In addition, stress hormones enhanced GluA1 phosphorylation and AMPA receptor-mediated electrical activity in the spinal cord. Sub-threshold stimulation induced spinal long-term potentiation in GluA1 phosphomimetic mutant mice, but not in wild-type mice. Therefore, our results suggest that psychosocial stress could induce acute-to-chronic pain transition after surgery by enhancing AMPA receptor phosphorylation and spinal central sensitization.

Biography

Feng Tao is an Associate Professor in the Department of Biomedical Sciences at Texas A&M University Baylor College of Dentistry, USA. He has received his RO1 award and Independent Scientist Award from NIH in 2012 and 2014, respectively. He has published more than 30 papers in peer-reviewed professional journals and is serving as an Editorial Board Member for some professional journals. He has also served as an invited reviewer for Johns Hopkins ACCM Seed Grant, NSF-sponsored Pilot Funding at Louisiana State University, Arizona Biomedical Research Commission, Britain Israel Research and Academic Exchange Partnership Regenerative Medicine Initiative, Wings for Life−Spinal Cord Research Foundation in Austria, Department of Veterans Affairs Rehabilitation Research and Development Service Spinal Cord Injury and Neuropathic Pain Panel, and NIH NRCS Study Section.

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