

PLENARY PRESENTATIONS

DISCOVERY OF POTENT NON-OPIOID ANALGESICS

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Opioid analgesics are associated with side effects including addiction, drug resistance and gastrointestinal injury, which greatly restrict their clinical application. Taking advantage of characteristic Uyghur medicinal plant resources in Xinjiang, this study aims to discover structurally novel, safe and efficient non-opioid analgesic constituents from indigenous medicinal plants, develop potent analgesic drug candidates without addictive potential, and address the bottleneck in the research and development of new clinical non-opioid analgesics.

Based on our research system for natural product screening and new drug discovery, authentic medicinal Uyghur herbs endemic to Xinjiang were selected. Modern separation and purification techniques guided by bioactivity tracking were adopted to systematically isolate constituents from extracts of medicinal parts. Chemical structures of isolated compounds were elucidated by spectroscopic technologies including mass spectrometry and nuclear magnetic resonance (NMR). In vivo analgesic activity was evaluated via classic analgesic models in mice, such as the hot-plate test and acetic acid writhing test, so as to screen lead compounds with high activity and low toxicity.

More than one hundred natural compounds were isolated and identified from multiple characteristic Uyghur medicinal plants from Xinjiang. Among them, six compounds with novel skeletons exhibited remarkable analgesic potency comparable to morphine, a widely used potent clinical analgesic. Pharmacological verification confirmed that these compounds do not activate opioid receptors, indicating they act as multi-target potent analgesic agents.

Characteristic Uyghur medicinal plants from Xinjiang constitute an excellent resource library for developing novel non-opioid analgesic drugs. The bioactive lead compounds obtained in this study feature novel structures, strong analgesic efficacy and favorable safety profiles, possessing promising prospects for new drug development. This research provides critical material basis and scientific evidence for the modernization of characteristic Uyghur medicines and the development of innovative analgesic agents.