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In This Issue

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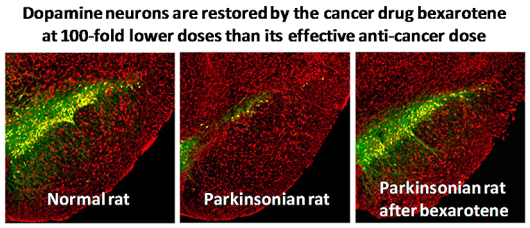
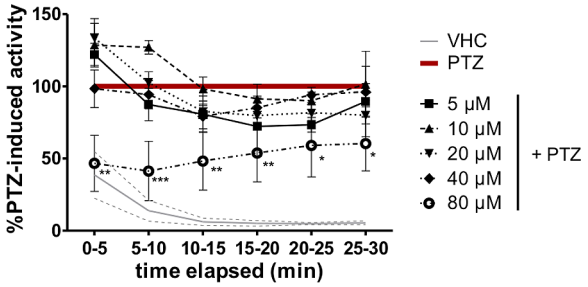
REPURPOSING A CANCER DRUG FOR PARKINSON'S DISEASE THERAPY



Nurr1 is nuclear hormone receptor strongly implicated in the growth, maintenance, and survival of dopaminergic neurons. It represents a promising therapeutic target for Parkinson's disease (PD). Drugs that activate Nurr1, however, have not yet been found. In the current issue, McFarland et al. (DOI: 10.1021/cn400100f) report a known cancer drug, bexarotene, that activates Nurr1 via its interaction with RXR receptors.

The authors provide compelling evidence that low doses of the FDA-approved drug bexarotene interact with Nurr1-RXR heterodimers and are effective in restoring cell loss and behavioral phenotype in an established rat model of PD.

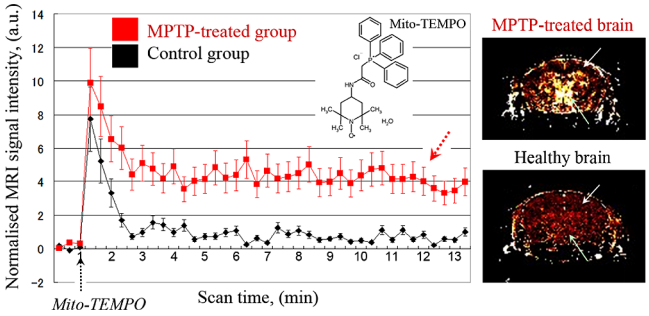
CHINESE RED SAGE, A REMEDY FOR SEIZURES



More than 60 million people suffer from epileptic seizures across the world, underscoring an urgent need to identify new antiepileptic drugs (AEDs). Toward this goal, Buenafe et al. (DOI: 10.1021/cn400140e) use a larval-stage zebrafish model for screening potential anticonvulsant agents. They identify tanshinones as an effective AED.

The authors showed that crude acetone extracts of Danshen, also known as Chinese red sage, reduced seizurelike movement in 7 days postfertilization larvae treated with the chemoconvulsant pentylenetetrazol (PTZ). Further studies revealed four active diterpenoids identified as tanshinones, which suppressed PTZ activity. One of the compounds, tanshinone IIA—used as a prescription drug in China to treat cerebral ischemia—was found to be active both in the larval-zebrafish seizure model and in a mouse seizure model specific for focal and drug-resistant seizures.

VISUALIZING SUPEROXIDE, A MEDIATOR OF NEURODEGENERATIVE DAMAGE IN PARKINSON'S DISEASE



The underlying mechanism that results in the death of nigrostriatal dopaminergic neurons, a characteristic of Parkinson's disease (PD), is unknown. In 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)-treated mice, a model of PD, alterations in energy metabolism, generation of reactive oxygen species, and changes in calcium levels were observed prior to loss of dopamine neurons. In the current issue, Zhelev et al. (DOI: 10.1021/cn400159h) develop a methodology to visualize oxidative events caused by MPTP administration.

The authors describe an approach for noninvasive imaging of superoxide generation in the dopaminergic area of the brain in PD. The method was based on the redox cycle of mito-TEMPO, a nitroxide derivative with superoxide scavenging properties suitable for magnetic resonance imaging. Subsequent experimentation demonstrated a link between superoxide generation and PD.

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