

# p21 Inducers as Neuroprotective and Anticancer Agents

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## Technology description

This invention discloses small molecules that activate the p21<sup>CIP1/WAF1</sup>, a protein that is not only neuroprotective, but promotes neurite remodeling and axonal regeneration. The most effective compounds in the screen included ciclopirox, dihydrocelastrol, chloroquine, colistimethate sodium, lycorine, acacetin, diphenylurea, and acetylcysteine.

This work arose as part of a larger project led by Dr. Raj Ratan, which has screened drugs and drug-like compounds in high throughput screens relevant to the program of destruction, cell-suicide, and scarring that characterize damage to the CNS, including stroke, traumatic brain injury, and spinal cord injury. The project has sought compounds that have activity against multiple targets -- or against a single target that can set off wide-ranging protective programs.

The general approach is described in a recent piece in [Stroke](#) called "Novel multi-modal strategies to promote brain and spinal cord injury recovery".

The primary screens have sought:

HIF activators / prolyl hydroxylase inhibitors ( [2009 J Neurosci](#) ; [2008 Ann N Y Acad Sci](#) ; [2008 Front. Bioscience](#) ; [2007 Neurochem Res](#) ; [2004 Stroke](#) );

Arginase 1 activators ( [2010 J Neurosci](#) ; [2006 J Neurosci](#) ; [2004 J Nutrition](#) )

p21<sup>CIP1/WAF1</sup> activators ( [2008 J Neurosci](#) )

ATF4 inhibitors ( [2008 J Exp Med](#) )

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