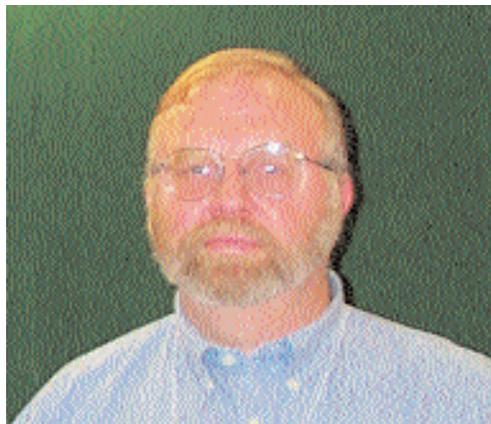


# Targeting Talk: *In vivo* Use of Targeted Toxins



**Dr. Ronald G. Wiley is a founder and scientific advisor to Advanced Targeting Systems. His expertise in the use of 192-Saporin and other targeted toxins is invaluable to targeted toxin users.**

*Q: Can you use targeted toxins in vivo?*

*A: Yes, Molecular Neurosurgery is designed as a tool for in vivo use.*

*Q: How do you recommend administration of the targeted toxin?*

*A: There are several ways to administer the toxins depending on the cells being targeted:*

1. Direct intraparenchymal pressure microinjection can be used to deliver the targeted toxin directly to target cells. This approach has been used successfully with several toxins, including SP-Saporin (Cat. # IT-07), in the striatum to kill striatal interneurons that express the NK-1 receptor. Long, slow infusions (0.1  $\mu\text{l}/\text{min}$ ) are probably the best way to do intraparenchymal injections.

*Wiley RG and Lappi DA. Neurosci Lett 230:97-100, 1997.*

2. Targeted toxins can also be injected into terminal fields and retrogradely transported to the cell bodies. This approach has been used successfully to selectively destroy locus coeruleus noradrenergic neurons that project to the olfactory bulb by injecting anti-DBH-saporin into the olfactory bulb.

*Blessing WW, Lappi DA, Wiley RG. Neurosci Lett 243:85-88, 1998.*

Intracortical injections of 192-Saporin (Cat. #IT-01) also have been used to destroy cholinergic basal forebrain neurons projecting to the injected patch of cortex.

*Sachdev R, Lu SM, Wiley RG, Ebner FJ. Neurophysiol, 79:3216-3228, 1998.*

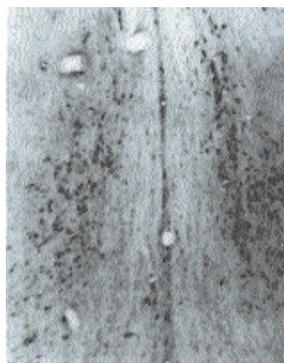
3. Intrathecal injections, either intraventricular or subarachnoid, have been used with great success. Intraventricular injections of 192-Saporin (Cat. #IT-01) in rats can reliably destroy the cholinergic basal forebrain.

*Wiley RG, Oeltmann TN, Lappi DA. Brain Res 562:149-53, 1991.*

Lumbar subarachnoid injections of SP-Saporin (Cat. #IT-07) can destroy lamina I neurons in the dorsal horn that express the NK-1 receptor.

*Mantyh PW, Rogers SD, Honore P, Allen BJ, Ghilardi JR, Li J, Daughters RS, Lappi DA, Wiley RG, Simone DA. Science 278:239-40, 1997.*

4. Lastly, SP-Saporin (Cat. #IT-07) has also been applied directly to the surface of the spinal cord to kill lamina I neurons expressing NK-1 receptor. In all cases, pilot studies to determine optimal toxin dose and injection parameters are recommended.



**Control**



**Treated**

LNGFR+ neurons of rat cholinergic forebrain. Photo on the right shows neurons after icv injection of 192-Saporin. The result is >95% elimination of LNGFR (p75)-positive neurons.

*Photos supplied by C. Wrenn and R.G. Wiley*