Targeting Talk: *Effective Toxins*

by Dr. Douglas Lappi

Q: Why do your directions for SSP-SAP state that it is to be used within hours after dissolution? To my knowledge, both proteins and peptides are stable in clean solution.

A: In fact, the two components of SSP-SAP (Stable Substance P and Saporin) are quite stable. However, we have found that many things happen in laboratories and some of them can impact stability. Probably the most severe is the loss of sterility. In that case, over time at room temperature or at 4°C, bacteria can grow on this rather excellent "medium." This would cause inactivation. Because many laboratories, due to molecular biology work, have high levels of resident bacteria, we prefer to emphasize playing it safe.

Even if saporin is a stable protein, it is a protein and can suffer denaturation. This occurs more rapidly at room temperature than at 4°C, and hardly at all in the frozen state (really, it is stable for years when stored at –80°C). The maintenance of precise activity is of extreme importance to our customers who use these materials *in vivo* (their assays are very sensitive), and so we choose to advise the most conservative course.

Q: I understand that theoretically only one molecule of Saporin taken up by a cell is enough to induce cell death. I have been looking for literature on this topic but have not come across anything.

A: Definitely theoretical. The only article that we know of that states anything close to that is: Yamaizumi *et al* (1978) One molecule of diphtheria toxin fragment A introduced into a cell can kill the cell. *Cell* 15(1): 245-250.

As you can see, this article speaks to the enzymatic chain of diphtheria toxin, which has a slightly different mechanism of action for shutting down protein synthesis, but otherwise is similar to saporin. In fact, we test all sorts of toxins against cells in controlled conditions, and we have only one candidate that is in this range; all the rest are orders of magnitude away. It takes more than thousands per cell. Another question would be: how many actually get in?

Targeting Teaser Winners

Congratulations to the puzzle solvers from our last newsletter. Each winner receives $100 credit towards research product purchases from Advanced Targeting Systems.

The solution to the puzzle was:

Jumbles: PHYSIOLOGY
MALARIA
CELLS
STAINING
NITRATE

Answer: CAMILLO GOLGI

WINNERS: Douglas J Taatjes, Univ Vermont * Ching-Hui Yang, Univ Texas Health Ctr * Susan Grand, Univ North Carolina * Thad Lindsay, Univ Minnesota * Alfia Kaibullina, Natl Inst of Health * Linda Rogers, Tulane Regional Primate Res Ctr * Catherine Ulibarri, Washington State Univ * Audrey Vasauskas, Panacea Pharmaceuticals Inc * Sheela Vyas, INSERM U497 ENS * Lea Chaskiel, CNRS UMR 1244 Inst Magendie * Jean-Bernard Dietrich, INSERM U338 Ctr Neuroch * Marie-Christine Lombard, INSERM U378 Inst. Magendie * April Garcia, Univ Texas Health Cntr Dept of Pharm * Jane Quirk, NINDS/DMNB * Jerry Keith, NIDDK * Joseph Menonna, E. Orange VA Med Center * Robert Speth, Univ Mississippi

Camillo Golgi was born at Corteno July 7, 1843. He studied medicine at the University of Pavia. Golgi was appointed to the Chair for General Pathology in 1881. He became interested in the investigation of the causes of malaria and he must be credited for having determined the three forms of the parasite and the three types of fever. After prolonged studies he found a way of photographing the most characteristic phases in 1890.

The work of greatest importance that Golgi carried out was a revolutionary method of staining individual nerve and cell structures, which is referred to as the black reaction. This method uses a weak solution of silver nitrate and is particularly valuable in tracing the processes and most delicate ramifications of cells.

Golgi shared the Nobel Prize for Physiology or Medicine 1906 with Santiago Ramón y Cajal for their work on the structure of the nervous system.