Diphtheria toxin requires proteolytic treatment for use in vitro

Intact diphtheria toxin requires proteolytic activation to demonstrate toxic activity. In many applications, this activation occurs naturally when the toxin is exposed to enzymes either in the bloodstream in *in vivo* applications, or in the culture media of some *in vitro* cellular systems.

However, in some cases the relevant proteolytic enzymes are not present and pre-activation may be required. This was studied in detail by Tsuneoka et al in their 1993 publication:-

http://www.jbc.org/content/268/35/26461.full.pdf

We have shown that furin treatment of intact diphtheria toxin is a highly efficient process as demonstrated below. Such treatment may be used to activate the toxin if this does not occur naturally in the experimental system being used.

Digestion of DIP-TNL by Furin (NEB)

1 vial DIP-TNL (#17110814, 1mg) was reconstituted with 1ml water. 25ug of protein was digested with 1 unit of Furin, with incubation at 37C for times shown. 3ug of protein loaded onto SDS-PAGE.

Intact, but inactive, Diphtheria toxin is effectively activated by Furin treatment for 2 hours.