SUMMARY

In this work the immobilization of biological molecules, such as oligopeptides and amino acids, on carbon nanotubes (CNTs) was studied. The dipeptide Boc-D-Trp-NH-N(Bzl)-CO-D-Trp} that present trypsin inhibitor activity was immobilized on a carbon nanotudes. This modification stabilizes the dipeptide's activity and finally the bound form can be used in many cycles without losing any activity.

With the intention to immobilize other oligopeptides on CNTS, a group of synthetic dipeptide and hexapeptides were studied for their protease inhibitor activity: {Boc-NH-N(Bzl)-CH_2-CO-D-Trp-Leu-OH} and the six hexapeptides {Glp^1-$NPhe^2$-Gly^3-[NH-N(Bzl)-CH_2-CO]^4-D-Trp^5-Leu^6-OH}, {Glp^1-$NAla^2$-Gly^3-[NH-N(Bzl)-CH_2-CO]^4-D-Trp^5-Leu^6-OH}, {Glp^1-Tic^2-Gly^3-[NH-N(Bzl)-CH_2-CO]^4-D-Trp^5-Leu^6-OH}, {Glp^1-$NPhe^2$-Gly^3-D-Trp^4-[NH-N(Bzl)-CO]^5-D-Trp^6-OH}, {Glp^1-$NAla^2$-Gly^3-D-Trp^4-[NH-N(Bzl)-CO]^5-D-Trp^6-OH} and {Glp^1-Tic^2-Gly^3-D-Trp^4-[NH-N(Bzl)-CO]^5-D-Trp^6-OH}. The immobilization of a conventional enzyme, such as trypsin, on a commercial material (epoxy-activated sepharose 6B) was studied as well.

Finally, carbon nanotubes were used as a carrier of specific amino acids in an attempt to mimic the enzymic active site. This was achieved through the attachment of the amino acids Tyr, Asp and Glu, residues of the known protease active site, on the surface of CNTs. The modified CNT was tested with substrates albumin or the synthetic p-toluenesulphonyl-L-argine methyl ester (TAME). The modified CNT with the three amino acids, mimics the proteases active site and exerts photolytic activity. Interested enough the modified CNTs can be used for many cycles with no loss of its activity.