Cell-penetrating peptides
Methods and protocols
Ulo Langel (ed)
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Among the present day scientific frontiers, the researches on the cell-penetrating peptides has a special place, since the scientific community has not yet reached a consensus even in the terminology on what we are referring to when we speak about cell-penetrating peptides studies. Thus, Prof. Ulo Langel (Dept. of Neurochemistry, Stockolm University, Stockolm, Sweden) rightly explain in a necessary preface that there are in use so many definition for the same things: protein transduction domain (PTDs), Trojan peptides, model amphipathic peptides (MAPs), membrane translocating sequences (MTS) that the best way to refer to all of these molecules is to call all of them cell-penetrating peptides, CPPs. Hence, there is a need for an accepted definition of CPPs, which is provided by Prof. Langel himself and reported in the preface: *CPPs are relatively short peptides, 5-40 aa, with the ability to gain access to the cell interior by means of different mechanisms, mainly including endocytosis and with the capacity to promote the intracellular delivery of covalently or noncovalently conjugated bioactive cargoes*.

This situation of in progress research is reflected in the volume structure where there are 39 chapters divided in five sections, the first two of which deal with the necessary historical background and the CPPs classification (part I, chapters 1-2) and the methods to test the CPP mechanisms which are not yet totally clarified (part II, chapters 3-16). The remaining part III, IV and V illustrate some methods that try to use the *unique properties* of CPPs to study cell functionality (part III, chapters 17-21) and here we get the highest hopes of doing well in therapy by exploiting the protein mimicking properties of CPPs.

In fact, some chapters deal with the mimicry capacity of CPPs; of particular interest is that presenting the selective induction of apoptosis by CPPs. Related to the study of cell functionality is the study of how to link the CPPs delivery to the regulation of gene expression via the interaction with the small oligonucleotides already known to play a role in RNA interference to modulate (silencing/altering) genes expression. These attempts are presented in part IV (chapters 22-28).

As a logical derivation part V (chapters 29-39) is suggesting strategies for an efficien *in vivo* CPPs delivery, which can constitute as much efficient drugs: good examples come from tumor-selective targeting and organ-selective delivery. Clearly enough, the cell-penetrating peptides volume is surely of great help for basic research and for clinicians engaged in translational medicine.

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