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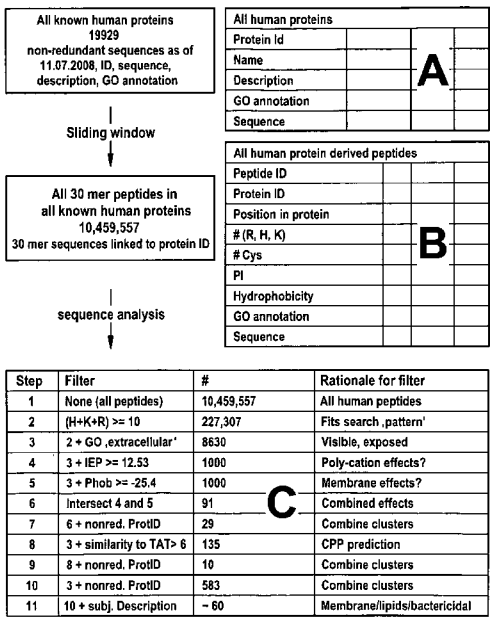
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(54) Title: CELL-PENETRATING PEPTIDES AND USES THEROF

Fig. 1



Step	Filter	#	Rationale for filter
1	None (all peptides)	10,459,557	All human peptides
2	(H+K+R) >= 10	227,307	Fits search ‚pattern'
3	2 + GO ‚extracellular'	8630	Visible, exposed
4	3 + IEP >= 12.53	1000	Poly-cation effects?
5	3 + Phob >= -25.4	1000	Membrane effects?
6	Intersect 4 and 5	91	Combined effects
7	6 + nonred. ProtID	29	Combine clusters
8	3 + similarity to TAT> 6	135	CPP prediction
9	8 + nonred. ProtID	10	Combine clusters
10	3 + nonred. ProtID	583	Combine clusters
11	10 + subj. Description	~ 60	Membrane/lipids/bactericidal

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(57) Abstract: The present invention relates to a peptide molecule capable of being internalized into a cell, wherein the peptide molecule (a) has a length of at least 10, preferably of at least 15 amino acid residues; (b) comprises in its primary amino acid sequence at least 25%, preferably at least 30% positively charged amino acid residues; and (c) is internalized into a cell with an efficacy being at least 80%, preferably at least 90% of the internalization efficacy of the TAT peptide having the amino acid sequence GRKKRRQRRRPPQ. The invention is also directed to a corresponding nucleic acid molecule encoding such peptide as well as to a composition comprising at least one such peptide being attached to any one of the group consisting of one or more nucleic acid molecules, one or more peptides or proteins, one or more small molecules, and one or more nanoparticles, wherein the attachment is accomplished by a linkage selected from the group consisting of a covalent linkage and a non-covalent linkage. Furthermore, the invention relates to a method of detecting the internalization behavior of such peptide or such composition, comprising (a) administering the peptide or composition to one or more cells; and (b) detecting the internalization of the peptide or composition. Finally, the invention concerns the use of such peptide or such composition for the transformation or transfection of one or more cells as well as in the prevention and/or treatment of a condition selected from the group consisting of cancer, immune diseases, cardiovascular diseases, neuronal diseases, infections, and inflammatory diseases.

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