Peptide-Mediated Delivery: Current Understanding and Prospect

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Arginine-rich peptides, including those derived from human immunodeficiency virus (HIV)-1 Tat protein, have been reported to translocate through cell membranes and to be utilized as carriers for the intracellular delivery of various oligopeptides and proteins in vitro and in vivo. In the recent research focused on the internalization mechanism of these peptides, significant contribution of endocytosis, including macropinocytosis, to the cellular uptake has been suggested. However, it would be difficult to explain the efficient internalization only by a single mechanism; the mechanisms would be very complicated and can be different depending on the conditions including selections of carrier peptides, cargos, cell types, concentration of the conjugates and so on. In this lecture, recent topics and problems on the peptide-mediated delivery will be discussed.