

Accepted Manuscript

Efficient synthesis of crgd functionalized polymers as building blocks of targeted drug delivery systems

Hajeeth Thankappan, Aykut Zelcak, Damla Taykoz, Volga Bulmus

PII: S0014-3057(18)30386-0
DOI: <https://doi.org/10.1016/j.eurpolymj.2018.04.025>
Reference: EPJ 8381

To appear in: *European Polymer Journal*

Received Date: 23 February 2018
Revised Date: 13 April 2018
Accepted Date: 20 April 2018

Please cite this article as: Thankappan, H., Zelcak, A., Taykoz, D., Bulmus, V., Efficient synthesis of crgd functionalized polymers as building blocks of targeted drug delivery systems, *European Polymer Journal* (2018), doi: <https://doi.org/10.1016/j.eurpolymj.2018.04.025>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



EFFICIENT SYNTHESIS OF cRGD FUNCTIONALIZED POLYMERS AS BUILDING BLOCKS OF TARGETED DRUG DELIVERY SYSTEMS

Hajeeth Thankappan,¹ Aykut Zelcak,^{1,2} Damla Taykoz³ and Volga Bulmus¹

¹Department of Bioengineering, Izmir Institute of Technology, Urla, Izmir, 35430 Turkey

²Biotechnology and Bioengineering Graduate Program, Izmir Institute of Technology, Urla, Izmir, 35430 Turkey

³Department of Chemical Engineering, Izmir Institute of Technology, Urla, Izmir, 35430 Turkey

ABSTRACT

Synthetic peptides with cyclic arginine-glycine-aspartate motif (cRGD) play an important role in cell recognition and cell adhesion. cRGD-decorated soluble polymers and polymeric nanoparticles have been increasingly used for cell-specific delivery of antitumor drugs. While the significance of cRGD modification for tumor cell-specific targeting of polymeric carriers is well-accepted, straightforward procedures ensuring the fidelity of cRGD modification of polymeric systems are still lacking. Herein, we have reported an in-situ polymerization approach for synthesis of cRGD-end-functionalized well-defined polymers as potential building blocks of targeted drug delivery systems. A new cRGD peptide functionalized RAFT agent was synthesized as confirmed by MALDI-TOF and ¹H NMR spectroscopy. The ability of this RAFT agent to control polymerizations was then tested using two different monomers oligoethyleneglycol acrylate and t-butyl methacrylate. The RAFT-controlled character of polymerizations and the living characteristic of the synthesized polymers were investigated through a series of kinetic experiments. The cytotoxicity and targeting capability of cRGD-functionalized OEGA polymers were investigated using cell lines expressing $\alpha_v\beta_3$ integrins at varying extents.

Keywords: RGD, RAFT polymerization, end-group functionalization, targeted drug delivery

Download English Version:

<https://daneshyari.com/en/article/7803693>

Download Persian Version:

<https://daneshyari.com/article/7803693>

[Daneshyari.com](https://daneshyari.com)