

CONTENTS

Cited in: BIOSIS/Biological Abstracts; CAB Abstracts; Chemical Abstracts Services; Current Contents (Life Sciences); EMBASE/Excerpta Medica; International Pharmaceutical Abstracts; PUBMED/MEDLINE/Index Medicus; Polymer Contents; Science Citation Index. Also covered in the abstract and citation database Scopus®. Full text available in ScienceDirect®

COVER STORY

290-290

Optimal nanoparticle design for effective transport through the blood-brains barrier

Kinam Park

Purdue University, Biomedical Engineering and Pharmaceuticals, West Lafayette, IN 47907, USA

REVIEWS

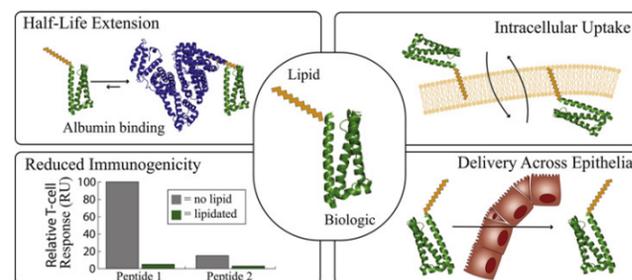
1-12

A review of lipidation in the development of advanced protein and peptide therapeutics

Romel Menacho-Melgar<sup>a</sup>, John S. Decker<sup>a</sup>, Jennifer N. Hennigan<sup>b</sup>, Michael D. Lynch<sup>a</sup>

<sup>a</sup>Department of Biomedical Engineering, Duke University, Durham, NC, USA

<sup>b</sup>Department of Chemistry, Duke University, Durham, NC, USA



31-49

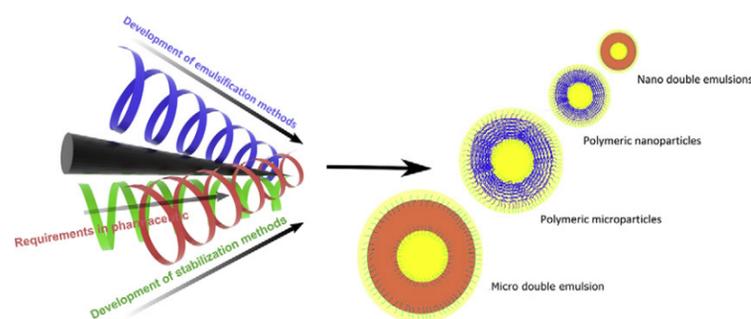
Double emulsions prepared by two-step emulsification: History, state-of-the-art and perspective

Shukai Ding<sup>a,b</sup>, Christophe A. Serra<sup>b</sup>, Thierry F. Vandamme<sup>c</sup>, Wei Yu<sup>b</sup>, Nicolas Anton<sup>c</sup>

<sup>a</sup>Materials Institute of Atomic and Molecular Science, Shaanxi University of Science & Technology, Xi'an, Shaanxi CN-710021, China

<sup>b</sup>Université de Strasbourg, CNRS, ICS UPR 22, Strasbourg F-67000, France

<sup>c</sup>Université de Strasbourg, CNRS, CAMB UMR 7199, Strasbourg F-67000, France



(Contents continued on inside back cover)

Additional material available online.

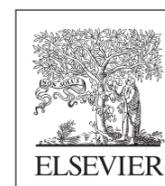


0168-3659(20190210)295:1-E

Available online at www.sciencedirect.com

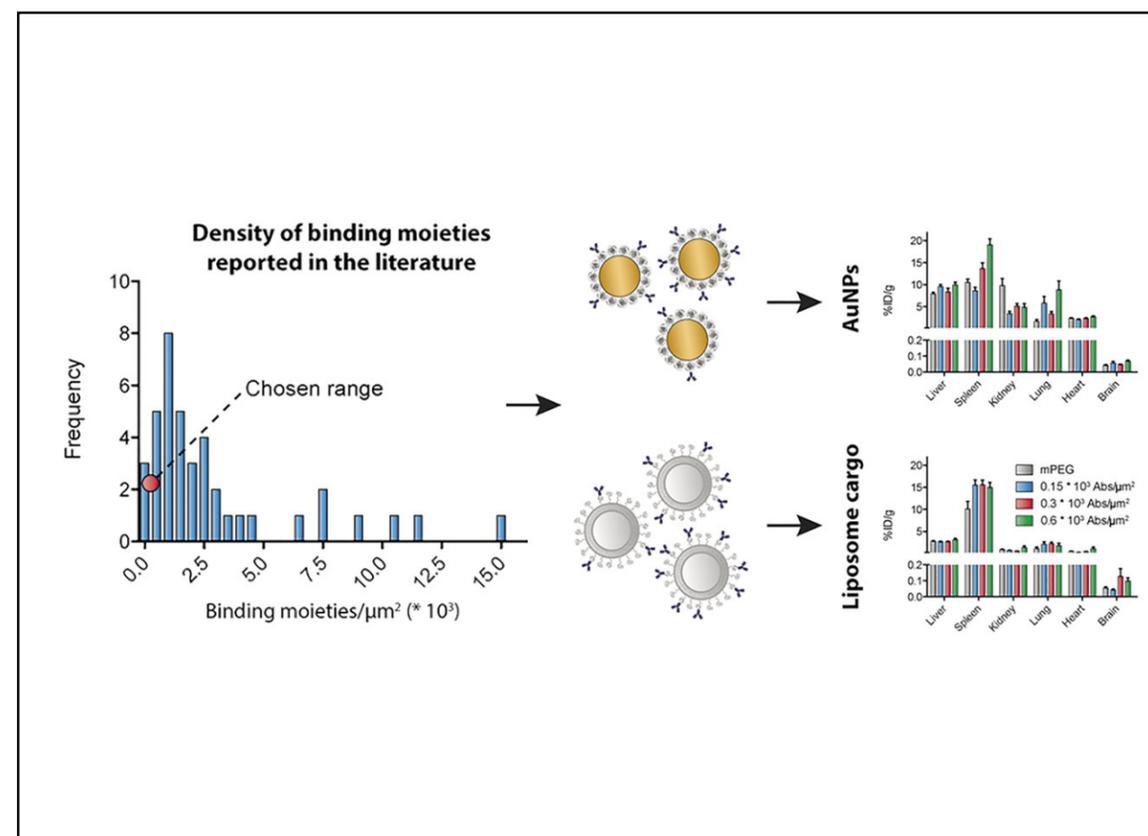
ScienceDirect

05054



# journal of controlled release

OFFICIAL JOURNAL OF THE CONTROLLED RELEASE SOCIETY AND THE JAPANESE SOCIETY OF DRUG DELIVERY SYSTEM



COVER STORY

Optimal nanoparticle design for effective transport through the blood-brain barrier

The *Journal of Controlled Release* (JCR) publishes high-quality research articles in the broad field of delivery science and technology. This includes drug delivery systems and all aspects of formulations, such as physicochemical and biological properties of drugs, design and characterization of dosage forms, release mechanisms, *in vivo* testing, and formulation research and development in the disciplines of pharmaceutical, diagnostic, agricultural, environmental, cosmetic, and food industries. Manuscripts that advance fundamental understanding of principles and/or demonstrate advantages of novel technologies in safety and efficacy over current clinical standards will be given priority. Each issue has the cover story highlighting the significance of a selected article published in the issue. At the end of each quarter, the JCR editors select "The Editors' Choice" from the published research articles.

© 2019 Elsevier B.V. All rights reserved.

This journal and the individual contributions contained in it are protected under copyright by Elsevier B.V., and the following terms and conditions apply to their use:

#### Photocopying

Single photocopies of single articles may be made for personal use as allowed by national copyright laws. Permission of the Publisher and payment of a fee is required for all other photocopying, including multiple or systematic copying, copying for advertising or promotional purposes, resale, and all forms of document delivery. Special rates are available for educational institutions that wish to make photocopies for non-profit educational classroom use.

For information on how to seek permission visit [www.elsevier.com/permissions](http://www.elsevier.com/permissions) or call (+44) 1865 843830 (UK) / (+1) 215 239 3804 (USA).

#### Derivative Works

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. Permission of the Publisher is required for resale or distribution outside the institution.

Permission of the Publisher is required for all other derivative works, including compilations and translations (please consult [www.elsevier.com/permissions](http://www.elsevier.com/permissions)).

#### Electronic Storage or Usage

Permission of the Publisher is required to store or use electronically any material contained in this journal, including any article or part of an article (please consult [www.elsevier.com/permissions](http://www.elsevier.com/permissions)).

Except as outlined above, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the Publisher.

#### Author inquiries

You can track your submitted article at <http://www.elsevier.com/track-submission>. You can track your accepted article at <http://www.elsevier.com/trackarticle>. You are also welcome to contact Customer Support via <http://service.elsevier.com>.

#### Language (usage and editing services)

Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the English Language Editing service available from Elsevier's WebShop <http://webshop.elsevier.com/languageediting/> or visit our customer support site <http://service.elsevier.com> for more information.

#### Illustration services

Elsevier's WebShop (<http://webshop.elsevier.com/illustrationservices>) offers Illustration Services to authors preparing to submit a manuscript but concerned about the quality of the images accompanying their article. Elsevier's expert illustrators can produce scientific, technical and medical-style images, as well as a full range of charts, tables and graphs. Image 'polishing' is also available, where our illustrators take your image(s) and improve them to a professional standard. Please visit the website to find out more.

**Publication information:** *Journal of Controlled Release* (ISSN 0168-3659). For 2019, volumes 293–316 are scheduled for publication. Subscription prices are available upon request from the Publisher or from the Elsevier Customer Service Department nearest you or from this journal's website (<http://www.elsevier.com/locate/jconrel>). Further information is available on this journal and other Elsevier products through Elsevier's website (<http://www.elsevier.com>). Subscriptions are accepted on a prepaid basis only and are entered on a calendar year basis. Issues are sent by standard mail (surface within Europe, air delivery outside Europe). Priority rates are available upon request. Claims for missing issues should be made within six months of the date of dispatch.

**Orders, claims, and journal inquiries:** please contact the Elsevier Customer Service Department nearest you:

**St. Louis:** Elsevier Customer Service Department, 3251 Riverport Lane, Maryland Heights, MO 63043, USA; phone: (877) 8397126 [toll free within the USA]; (+1) (314) 4478878 [outside the USA]; fax: (+1) (314) 4478077; e-mail: [JournalCustomerService-usa@elsevier.com](mailto:JournalCustomerService-usa@elsevier.com)

**Oxford:** Elsevier Customer Service Department, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, UK; phone: (+44) (1865) 843434; fax: (+44) (1865) 843970; e-mail: [JournalsCustomerServiceEMEA@elsevier.com](mailto:JournalsCustomerServiceEMEA@elsevier.com)

**Tokyo:** Elsevier Customer Service Department, 4F Higashi-Azabu, 1-Chome Bldg, 1-9-15 Higashi-Azabu, Minato-ku, Tokyo 106-0044, Japan; phone: (+81) (3) 5561 5037; fax: (+81) (3) 5561 5047; e-mail: [JournalsCustomerServiceJapan@elsevier.com](mailto:JournalsCustomerServiceJapan@elsevier.com)

**The Philippines:** Elsevier Customer Service Department, 2nd Floor, Building H, UP-Ayalaland Technohub, Commonwealth Avenue, Diliman, Quezon City, Philippines 1101; phone: (+65) 63490222; fax: (+63) 2 352 1394; e-mail: [JournalsCustomerServiceAPAC@elsevier.com](mailto:JournalsCustomerServiceAPAC@elsevier.com)

**Sponsored Supplements and/or Commercial Reprints:** For more information please contact Elsevier Life Sciences Commercial Sales, Radarweg 29, 1043 NX Amsterdam, The Netherlands; phone: (+31) (20) 485 2939 / 2059; e-mail: [LSCS@elsevier.com](mailto:LSCS@elsevier.com)

**Advertising information:** If you are interested in advertising or other commercial opportunities please e-mail [Commercialsales@elsevier.com](mailto:Commercialsales@elsevier.com) and your enquiry will be passed to the correct person who will respond to you within 48 hours.

**USA mailing notice:** *Journal of Controlled Release* (ISSN 0168-3659) is published semimonthly by Elsevier B.V., Radarweg 29, 1043 NX Amsterdam, The Netherlands. Periodicals postage paid at Jamaica, NY 11431 and additional mailing offices.

**USA POSTMASTER:** Send change of address to *Journal of Controlled Release*, Elsevier Customer Service Department, 3251 Riverport Lane, Maryland Heights, MO 63043, USA.

**AIRFREIGHT AND MAILING** in USA by Air Business Ltd., c/o Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA.

#### Notice

No responsibility is assumed by the Publisher or the Controlled Release Society for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the material herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made.

Although all advertising material is expected to conform to ethical (medical) standards, inclusion in this publication does not constitute a guarantee or endorsement of the quality or value of such product or of the claims made of it by its manufacturer.

© The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper)

For a full and complete Guide for Authors, please go to <http://www.elsevier.com/locate/jconrel>

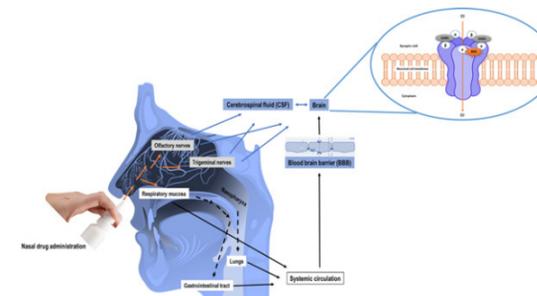
(contents continued from outside back cover)

#### 187–200

### Nose-to-brain delivery of lipid-based nanosystems for epileptic seizures and anxiety crisis

C. Costa<sup>a</sup>, J.N. Moreira<sup>b,c</sup>, M.H. Amaral<sup>a</sup>, J.M. Sousa Lobo<sup>a</sup>, A.C. Silva<sup>a,d</sup>

<sup>a</sup>UCIBIO, REQUINTE, Laboratory of Pharmaceutical Technology, Centre of Research in Pharmaceutical Sciences, Faculty of Pharmacy, University of Porto, Porto, Portugal  
<sup>b</sup>CNC - Center for Neuroscience and Cell Biology, Faculty of Medicine (Pólo I), University of Coimbra, Coimbra, Portugal  
<sup>c</sup>FFUC - Faculty of Pharmacy, Pólo das Ciências da Saúde, University of Coimbra, Coimbra, Portugal  
<sup>d</sup>FP-ENAS (UFP Energy, Environment and Health Research Unit), CEBIMED (Biomedical Research Centre), Faculty of Health Sciences, University Fernando Pessoa, Porto, Portugal

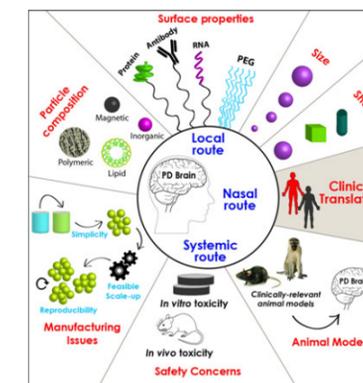


#### 201–213

### Micro- and nanotechnology approaches to improve Parkinson's disease therapy

Pablo Vicente Torres-Ortega<sup>a,b</sup>, Laura Saludas<sup>a,b</sup>, Amira Sayed Hanafy<sup>c</sup>, Elisa Garbayo<sup>a,b</sup>, María José Blanco-Prieto<sup>a,b</sup>

<sup>a</sup>Department of Pharmaceutical Technology and Chemistry, Faculty of Pharmacy and Nutrition, Universidad de Navarra, C/Irunlarrea 1, 31008 Pamplona, Spain  
<sup>b</sup>Instituto de Investigación Sanitaria de Navarra, IdISNA, C/Irunlarrea 3, 31008 Pamplona, Spain  
<sup>c</sup>Department of Pharmaceutics and Pharmaceutical Technology, Faculty of Pharmacy and Drug Manufacturing, Pharos University in Alexandria (PUA), Alexandria, Egypt

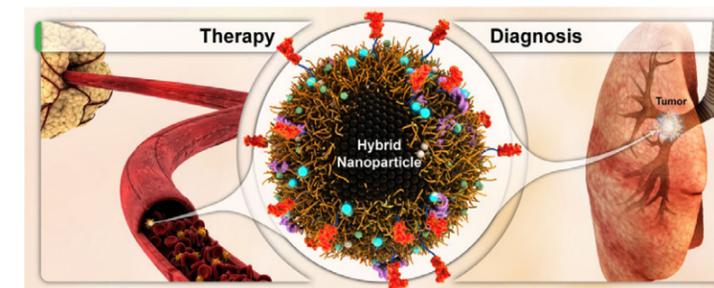


#### 250–267

### New insights into designing hybrid nanoparticles for lung cancer: Diagnosis and treatment

Fatemeh Mottaghtalab<sup>a</sup>, Mehdi Farokhi<sup>b</sup>, Yousef Fatahi<sup>c</sup>, Fatemeh Atyabi<sup>a</sup>, Rassoul Dinarvand<sup>a</sup>

<sup>a</sup>Nanotechnology Research Centre, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran  
<sup>b</sup>National Cell Bank of Iran, Pasteur Institute of Iran, Tehran, Iran  
<sup>c</sup>Department of Pharmaceutical Nanotechnology, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran



(Contents continued on last page of this issue)