

# Medicinal Chemistry and Pharmacological Potential of Fullerenes and Carbon Nanotubes

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### **VOLUME 1: MEDICINAL CHEMISTRY AND PHARMACOLOGICAL POTENTIAL OF FULLERENES AND CARBON NANOTUBES**

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 Springer

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# Preface

The emerging field of nanotechnology is affirming its increasing importance day by day. In this context fullerenes and carbon nanotubes (CNTs) play an important role. These new allotropic forms of carbon have been discovered in the last two decades, and, since then, they have stimulated the curiosity and interest of physicists and chemists.

This book is the first of a new series entitled “Carbon Materials: Chemistry and Physics”, the purpose of which is to analyze the new frontiers of carbon.

This volume summarizes the more recent advances on fullerenes and carbon nanotubes facing the biological-medical horizon, an important and interesting area to the scientific community.

We will present general overviews of fullerenes and CNTs that are state-of-the-art in biomedical applications, deepening their principal and more promising exploitations.

In particular for fullerenes, antioxidant properties and photodynamic activity are presented in detail, together with the analysis of gadolinium endohedrals as magnetic resonance imaging (MRI) contrast agents. Moreover, drug delivery based on carbon nanomaterials has been illustrated.

Few chapters are dedicated to toxicity and to the use of nanomaterials as pollutant probes. The debate on fullerene and CNT toxicity is open and reports different results, which are not always able to abolish the concern about pollution related to the industrial production and their impact on the environment. However, it is possible to state that positive evidence for their favorable applications in medicine has emerged.

Theoretical calculation potentialities have been examined in few chapters, giving new instruments to predict fullerene solubility in different solvents, such as fatty acid esters. Visualization approaches necessary to study unusual compounds such as CNT are herein presented. Despite the structural novelty of CNT, its resemblance to cellular structures is highlighted, launching or confirming the hypothesis of using CNTs as communication devices between cells.

Considering the specificity of the field, this book is mainly addressed to researchers who have delved, or who want to delve, into carbon nanoworld, but at

the same time, it presents a general and accurate view of carbon nanotechnology accessible to researchers intrigued by this topic, but not yet experts in the field.

April 2008

Tatiana Da Ros  
Franco Cataldo

# Contents

<b>Preface</b> .....	v
<b>1 Twenty Years of Promises: Fullerene in Medicinal Chemistry</b> .....	1
Tatiana Da Ros	
<b>2 Biomedical Applications of Functionalised Carbon Nanotubes</b> .....	23
Alberto Bianco, Raquel Sainz, Shouping Li, Hélène Dumortier, Lara Lacerda, Kostas Kostarelos, Silvia Giordani, and Maurizio Prato	
<b>3 Antioxidant Properties of Water-Soluble Fullerene Derivatives</b> .....	51
Florian Beuerle, Russell Lebovitz, and Andreas Hirsch	
<b>4 Fullerenes as Photosensitizers in Photodynamic Therapy</b> .....	79
Pawel Mroz, George P. Tegos, Hariprasad Gali, Timothy Wharton, Tadeusz Sarna, and Michael R. Hamblin	
<b>5 Photodynamic Inactivation of Enveloped Viruses by Fullerene: Study of Efficacy and Safety</b> .....	107
Vladimir V. Zarubaev, Inna Belousova, Vladimir Rylkov, Alexander Slita, Alexey Sirotkin, Pavel Anfimov, Tatyana Muraviova, and Andrey Starodubtsev	
<b>6 Effects of Photoexcited Fullerene C<sub>60</sub>-Composites in Normal and Transformed Cells</b> .....	123
S.V. Prylutska, I.I. Grynyuk, O.P. Matyshevskaya, A.A. Golub, A.P. Burlaka, Yu.I. Prylutskiy, U. Ritter, and P. Scharff	
<b>7 Biological Effects in Cell Cultures of Fullerene C<sub>60</sub>: Dependence on Aggregation State</b> .....	139
Levon B. Piotrovsky, Mikhail Yu. Erokin, Elena M. Eropkina, Marina A. Dumpis, and Oleg I. Kiselev	

<b>8 Gadolinium Endohedral Metallofullerene-Based MRI Contrast Agents</b> . . . . .	157
Robert D. Bolskar	
<b>9 Biomolecules Functionalized Carbon Nanotubes and Their Applications</b> . . . . .	181
Daxiang Cui	
<b>10 Applications of Carbon-Based Nanomaterials for Drug Delivery in Oncology</b> . . . . .	223
Nicole H. Levi-Polyachenko, David L. Carroll, and John H. Stewart, IV	
<b>11 Visualization of Carbon Nanoparticles Within Cells and Implications for Toxicity</b> . . . . .	267
Alexandra Porter and Mhairi Gass	
<b>12 Pharmacological Applications of Biocompatible Carbon Nanotubes and Their Emerging Toxicology Issues</b> . . . . .	283
Tae-Joon Park, Jeffrey G. Martin, and Robert J. Linhardt	
<b>13 Solubility of Fullerenes in Fatty Acids Esters: A New Way to Deliver <i>In Vivo</i> Fullerenes. Theoretical Calculations and Experimental Results</b> . . . . .	317
Franco Cataldo	
<b>14 New Approach to QSPR Modeling of Fullerene C<sub>60</sub> Solubility in Organic Solvents: An Application of SMILES-Based Optimal Descriptors</b> . . . . .	337
A.A. Toropov, B.F. Rasulev, D. Leszczynska, and J. Leszczynski	
<b>15 Functionalized Nanomaterials to Sense Toxins/Pollutant Gases Using Perturbed Microwave Resonant Cavities</b> . . . . .	351
Aman Anand, J.A. Roberts, and J.N. Dahiya	
<b>16 Cellular Nanotubes: Membrane Channels for Intercellular Communication</b> . . . . .	363
Raquel Negrão Carvalho and Hans-Hermann Gerdes	
<b>Index</b> . . . . .	373
<b>Color Plates</b> . . . . .	379