3MICT

Medical and Biological Physics

Ministry of Health Care of Ukraine
O. O. Bogomolets National Medical University

MEDICAL AND BIOLOGICAL PHYSICS

Edited by Prof. **Alexander V. Chalyi**

Recommended by the Ministry of Health Care of Ukraine as a textbook for the students of higher medical establishments of the IV accreditation level

Fourth edition

Vinnytsia
Nova Knyha
2020

UDC 577.3(075.8)
M42

Recommended by the Ministry of Health Care of Ukraine as a textbook for the students of higher medical establishments of the IV accreditation level (letter № 08.01-47/2735 by 25.12.2009)

Authors:

A. V. Chalyi – Head of the Department of Medical and Biological Physics, Corresponding member of the Academy of Pedagogical Sciences of Ukraine, Dr. Sci. (Phys. & Math.), Professor; **Ya. V. Tsekhmister** – Deputy Rector of the National Medical University, Head of the Department of Biomedical Engineering, Dr. Sci. (Pedagogy), Cand. Sci. (Phys. & Math.), Professor; **B. T. Agapov** – Associate Professor, Dr. Sci. (Biology); **N. V. Stuchynska** – Associate Professor, Dr. Sci. (Pedagogy.); **A. V. Melenevska** – Associate Professor, Cand. Sci. (Biology); **M. I. Murashko** – Associate Professor, Cand. Sci. (Tech.); **N. F. Radchenko** – Associate Professor, Cand. Sci. (Chem.); **I. F. Margolych** – Associate Professor, Cand. Sci. (Phys. & Math.); **V. V. Pashchenko** – Associate Professor, Cand. Sci. (Pedagogy); **D. V. Lukomskyi** – Assistant Professor; **E. V. Zaitseva** – Assistant Professor, Cand. Sci. (Phys. & Math.); **E. N. Chaika** – Assistant Professor, Cand. Sci. (Phys. & Math.); **N. L. Grytsenko** – Assistant Professor.

Reviewers:

L. A. Bulavin – Head of the Department of Molecular Physics (Taras Shevchenko National University of Kyiv), Academician of the National Academy of Sciences of Ukraine, Dr. Sci. (Phys. & Math.), Professor.

N. S. Myroshnichenko – Head of the Department of Biophysics (Taras Shevchenko National University of Kyiv), Dr. Sci. (Biology), Professor.

V. I. Dotsenko – Professor of the Department of Medical Biology (National Stomatological Medical Academy), Dr. Sci. (Phys. & Math.), Professor.

L. Ya. Avrakhova – Head of the Department of Foreign Languages (National Medical University), Associate Professor.

M42 **Medical and Biological Physics** : textbook for students of higher medical institutions of the IV accreditation level / Chalyi A. V., Tsekhmister Ya. V., Agapov B. T. [et al.] ; Edited by A. Chalyi. – 4th ed. – Vinnytsia : Nova Knyha, 2020. – 480 pp.

ISBN 978-966-382-804-6

The book is aimed at elucidating the most important aspects of the medical and biological physics in accordance with the program asserted by the Ministry of Health Care of Ukraine, and written for the students of higher medical institutions as well as for teachers, scientific researchers and all those readers interested in modern problems of the medical and biological physics.

UDC 577.3(075.8)

ISBN 978-966-382-804-6

CONTENTS

Навчальне видання

Чалий Олександр Васильович
Цехмістер Ярослав Володимирович
Агапов Борис Терентійович та ін.

Медична та біологічна фізика

Підручник (англійською мовою)

Відповідальний редактор: *І. В. Шпента*
Коректор: *Л. Я. Шутова*
Комп'ютерна верстка: *Г. А. Пєшков*

Підписано до друку 25.11.19. Формат 60×84/16. Папір офсетний.
Гарнітура Таймс. Друк офсетний. Ум. друк. арк. 28,00. Зам. № 1961.

ПП "Нова Книга"
21029, м. Вінниця, вул. М. Ващука, 20
Свідоцтво про внесення суб'єкта видавничої справи
до Державного реєстру видавців, виготівників
і розповсюджувачів видавничої продукції
ДК № 2646 від 11.10.2006 р.
Тел. (0432) 56-01-87. Факс 56-01-88
E-mail: info@novaknyha.com.ua
www.nk.in.ua