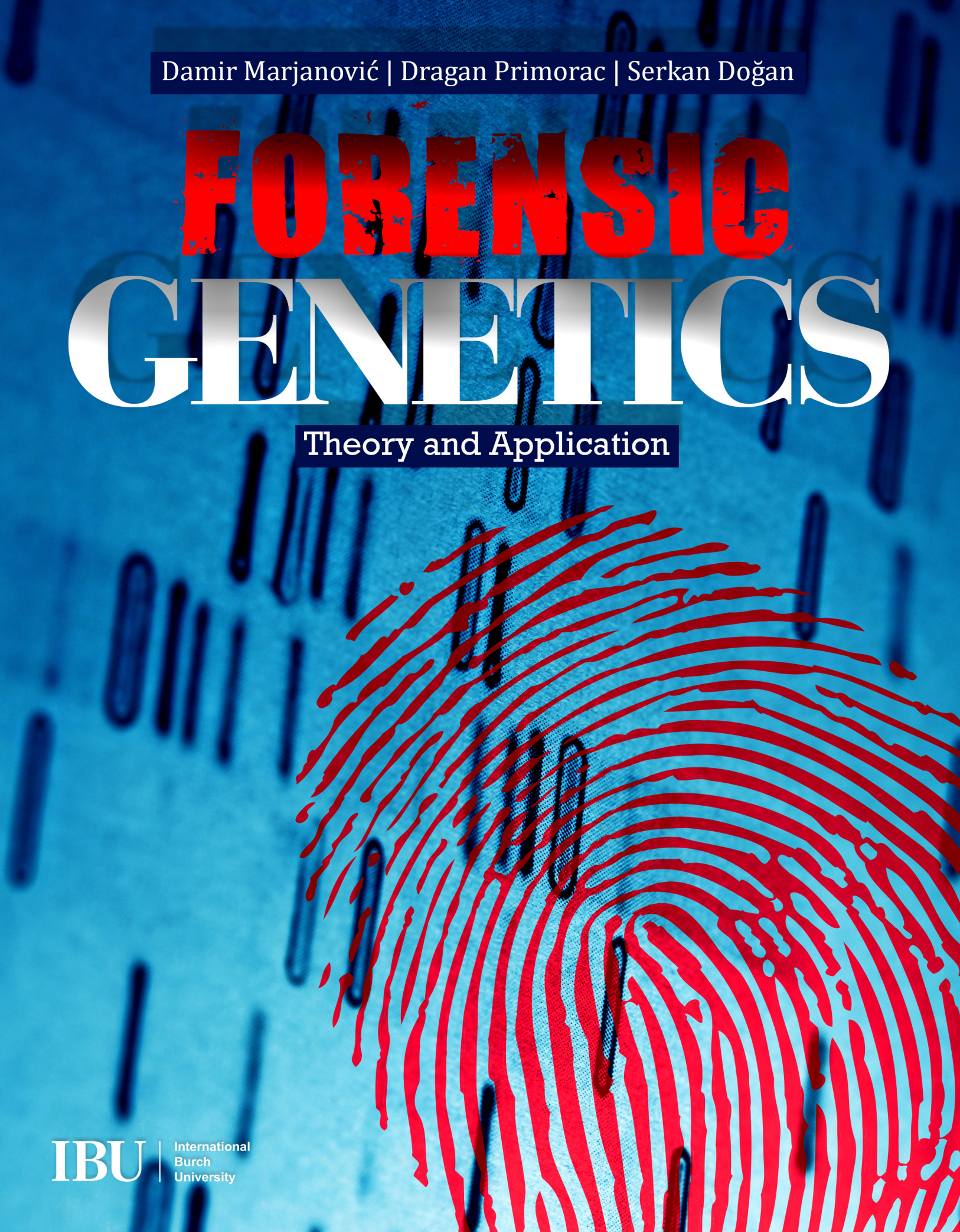
Damir Marjanović | Dragan Primorac | Serkan Doğan

FORENSIC GENETICS

Theory and Application



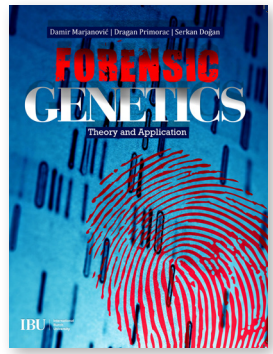
IBU | International Burch University

FORENSIC GENETICS

Theory and Application

IBU | International Burch University

FORENSIC GENETICS
THEORY AND APPLICATION



Damir Marjanović, Ph.D.
Dragan Primorac, M. D. , Ph.D.
Serkan Doğan, Ph.D.

Publisher:
International Burch University, Sarajevo, Bosnia and Herzegovina

Printed by:
Sabah Print d.o.o.

DTP-Design:
Veysel Cebe

Circulation:
500 copies

Place of publication:
Sarajevo, Bosnia and Herzegovina

CIP - Katalogizacija u publikaciji

Nacionalna i univerzitetska biblioteka

Bosne i Hercegovine, Sarajevo

577.21:340.64

MARJANOVIĆ, Damir

Forensic genetics : theory and application / Damir Marjanović, Dragan Primorac, Serkan Doğan. - Sarajevo : International Burch University, 2018. - 289 str. : ilustr. ; 28 cm

Bibliografija uz tekst. - Registar.

ISBN 978-9958-834-63-9

1. Primorac, Dragan 2. Doğan, Serkan

COBISS.BH-ID 26376198

IBU | International Burch University

FORENSIC GENETICS

Theory and Application

Damir Marjanović, Ph.D.

Professor of Forensic Genetics and Molecular Anthropology, Department of Genetics and Bioengineering, International Burch University, Sarajevo, Bosnia and Herzegovina

Scientific Associate, Institute for Anthropological Research, University of Zagreb, Zagreb, Croatia

Dragan Primorac, M.D., Ph.D.

President of the Board of Trustees, St. Catherine Specialty Hospital, Zagreb and Zabok, Croatia

Adjunct Professor of Forensic Science, Eberly College of Science, The Pennsylvania State University, University Park, PA, USA

Adjunct Professor of Forensic Science, The Henry C. Lee College of Criminal Justice and Forensic Sciences, University of New Haven, West Haven, CT, USA

Professor of Pediatric Medicine, Medical School, University of Split, Split, Croatia

Professor of Pediatric Medicine, Medical School, University of Osijek, Osijek, Croatia

Professor, Medical School, University of Rijeka, Rijeka, Croatia

Serkan Doğan, Ph.D.

Assistant Professor of Population Genetics and Forensic Genetics, Department of Genetics and Bioengineering, International Burch University, Sarajevo, Bosnia and Herzegovina

Contributors

Adna Ašić
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Monia Avdić
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Larisa Bešić
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Lada Lukić Bilela
Department of Biology
Faculty of Natural Sciences and Mathematics
University of Sarajevo
Sarajevo, Bosnia and Herzegovina
BIOSPEL – Biospeleological Society of Bosnia and Herzegovina
Sarajevo, Bosnia and Herzegovina
ADIPA – Society for Research and Conservation of Croatian Natural Diversity
Zagreb, Croatia

Elma Ferić Bojić
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Jasmina Čakar
Institute for Genetic Engineering and Biotechnology
University of Sarajevo
Sarajevo, Bosnia and Herzegovina

Serkan Doğan
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Mirela Džehverović
Institute for Genetic Engineering and Biotechnology
University of Sarajevo

Mirsada Hukić
Institute for Biomedical Diagnostics and Research NALAZ
Sarajevo, Bosnia and Herzegovina
Academy of Sciences and Arts of Bosnia and Herzegovina
Sarajevo, Bosnia and Herzegovina

Damir Marjanović
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina
Institute for Anthropological Research
University of Zagreb
Zagreb, Croatia

Enisa Omanović Mikličanin
Faculty of Agriculture and Food Science
University of Sarajevo
Sarajevo, Bosnia and Herzegovina

Imer Muhović
Ascidea Genomics & Bioinformatics CRO
Barcelona, Spain

Lejla Kovačević Mulahasanović
Center for Genomics and Transcriptomics, CeGaT, GmbH
Tübingen, Germany

Dragan Primorac
St. Catherine Specialty Hospital
Zagreb and Zabok, Croatia
Eberly College of Science
The Pennsylvania State University
University Park, PA, USA
The Henry C. Lee College of Criminal Justice and Forensic Sciences
University of New Haven
West Haven, CT, USA
Medical School
University of Split
Split, Croatia
Medical School
University of Osijek
Osijek, Croatia
Medical School
University of Rijeka
Rijeka, Croatia

Lejla Smajlović Skenderagić
Department of Genetics and Bioengineering
Faculty of Engineering and Natural Sciences
International Burch University
Sarajevo, Bosnia and Herzegovina

Table of Contents and Authors

Edited by:
Damir Marjanović, Ph.D., Dragan Primorac, M. D., Ph.D., Serkan Doğan, Ph.D.

Contents

FOREWORD

The science of the 21st century has not given up on its rapid development. The pace of evident progress in certain scientific disciplines, especially those relying on applied genetics, does not allow for a breakthrough in the collection, sorting and presentation of the latest achievements made in hundreds of laboratories around the world. Continuous education of scientists, professors, experts, and users of scientific achievements has never been this prominent and observable.

After a brief analysis of the development of forensic genetics in the past five years, we have decided that it would be wise to approach the complementation of existing material available with, as we then thought, "some new information". But when we included everything we wanted to add onto the previous edition, we found that the new facts, hypotheses and models have been generated, as well as a promising direction for potential development established. Soon upon this realization, we had nothing left to do but to, significantly influenced by young and enthusiastic associates, "roll up our sleeves" and prepare a new textbook. As a result, this book was created, which at the moment of its creation is probably the only existing edition that includes the most up-to-date information, especially related to the new multiplex STR systems, next-generation sequencing platforms and lineage markers, as well as new approaches in forensic DNA analysis in general. Two completely new chapters have been prepared, including the topics of food forensics and microbiology in forensic investigations. We are especially proud of the last chapter of this book that gives brief, understandable and highly applicable guidelines for proper sample handling, collection and storage, and overall model of behavior at the crime scene.

As in the previous editions of this material, we tried to present the basic molecular biological, biochemical, statistical and technological knowledge, and other principles that must be known in order to comprehend the application of fundamental scientific knowledge in forensic genetics. Also, we aimed at adding everything that is important into this book, and also what is written within the best books of the world, and everything that we have learnt from our practical work in the past decade. By preparing this edition in English language, we have thought of potential international readers of our book and tried our best to make this text as accessible worldwide as possible.

Damir Marjanović
Dragan Primorac
Serkan Doğan

Sarajevo/Zagreb, Summer of 2018