

CONTENT

Preface	9
<i>William Didden</i>	
A BRIEF OVERVIEW OF HUMAN GENETIC VARIATION	13
<i>Andrea Novelletto and Bianca Maria Ciminelli</i>	
Introduction	13
SNPs	14
STRs	17
SV	21
Representing the geographic arrangement of diversity	25
Discussion	27
HUMAN MITOCHONDRIAL DNA AND ITS MUTATIONS	33
<i>Markéta Tesařová and Jiří Zeman</i>	
Introduction	33
Mitochondria and their function	34
Mitochondrial genome	35
Specifics of mitochondrial genetics	37
Mitochondrial disorders	40
THE INTERPLAY BETWEEN THE HUMAN MICROBIOME AND HUMAN GENETICS	49
<i>Juraj Bosák, David Šmajš</i>	
Introduction	49
Human genetics, diet, and the human microbiome	50
Diseases of the gastrointestinal system and the human microbiome ...	51
Metabolic diseases and the human microbiome	55
Immune disorders and the human microbiome	57
Cardiovascular disorders and the human microbiome	60
Lung disorders and the human microbiome	61

ADDICTION GENOMICS65

Ondřej Šeda

Introduction 65

Genetic component of addiction..... 66

Cigarette Smoking..... 68

Alcohol 69

Cannabis 70

Stimulants..... 71

Opioids 71

Outlook..... 72

**DEEP LEARNING IN GENETICS AND PROTEOMICS,
INCLUDING THEIR GOAL, NETWORK STRUCTURES,
AND RESULTS75**

Xianglilan Zhang, Xuemeng Zhang, Ondřej Šeda

Introduction to Deep Learning 77

Deep Learning in Genomics 77

Deep Learning in Proteomics 82

HUMAN GENOME PROJECTS

From the HGP to 1K, 10K and 100K and others 87

Radim Brdička