Record Nr. UNINA9910807925403321 Evolution in health and disease / / edited by Stephen C. Stearns and **Titolo** Jacob C. Koella Pubbl/distr/stampa Oxford;; New York,: Oxford University Press, 2008 **ISBN** 0-19-154876-6 1-4356-4115-9 1-281-37136-X 9786611371364 Edizione [2nd ed.] Descrizione fisica xxi, 374 p. : ill Oxford biology Collana StearnsS. C <1946-> (Stephen C.) Altri autori (Persone) KoellaJacob C 616/.042 Disciplina Soggetti Medical genetics Human evolution Diseases - Causes and theories of causation Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di bibliografia Includes bibliographical references (p. 313-363) and index. Intro -- Contents -- List of Contributors -- Part I: Introduction -- 1 Nota di contenuto Introducing evolutionary thinking for medicine -- Introduction --Mismatched to modernity -- Infection -- Reproduction -- Populations have histories -- Evolutionary technologies -- The nature of evolutionary explanations -- Natural selection -- Random events and neutral variation: how neutral evolution works -- Trade-offs --Macroevolution -- Conclusion -- What doctors need to know about evolution and why -- Part II: The history and variation of human genes -- 2 Global spatial patterns of infectious diseases and human evolution -- Introduction -- Geographical aspects of human diseases --Pathogen distribution and human genetic evolution -- Infectious diseases and human life-history traits -- Summary --Acknowledgments -- 3 Medically relevant variation in the human genome -- Introduction -- Molecular markers -- Linkage disequilibrium, recombination and haplotype blocks -- The HapMap project -- Structural variation -- Inference of evolutionary processes --

Causal SNPs and the magnitude of their effects -- Summary --

Acknowledgments -- 4 Health consequences of ecogenetic variation -- Introduction -- Genetic basis of variation in drug metabolism and response -- Genetic basis of monogenic drug reactions -- Genetic basis of complex pharmacogenetic traits -- Genetic basis of chemosensory perception and food preferences -- The structure of human populations -- Conclusions -- Acknowledgments -- 5 Human genetic variation of medical significance -- Introduction -- The pattern of human genetic variation -- Complex disease and evolution -- Summary -- Acknowledgments -- Part III: Natural selection and evolutionary conflicts -- 6 Intimate relations: Evolutionary conflicts of pregnancy and childhood -- Introduction -- Parental justice -- Internal conflicts -- Credibility problems.

Pregnancy termination -- Maternal circulation -- Preeclampsia --Growth -- Summary -- Acknowledgments -- 7 How hormones mediate trade-offs in human health and disease -- Introduction: Hormones, life history, evolution, and health -- Hormones and trade-offs in males --Hormones and female reproductive trade-offs -- Contemporary medical implications -- Summary -- 8 Functional significance of MHC variation in mate choice, reproductive outcome, and disease risk --Introduction -- Genes of the major histocompatibility complex --Pathogen-mediated selection on MHC genes -- Sexual selection on MHC genes -- MHC-linked olfactory cues -- MHC and reproductive outcome -- HLA-G in reproduction, immune regulation, and disease --The cost of protection: non-adaptive consequences of MHC diversity --Conclusions -- Summary -- Acknowledgments -- 9 Perspectives on human health and disease from evolutionary and behavioral ecology --Introduction -- Phenotypic plasticity -- Kin selection theory -- Lifehistory theory -- Parental investment theory -- Sexual selection theory -- Summary -- Acknowledgments -- Part IV: Pathogens: resistance, virulence, variation, and emergence -- 10 The ecology and evolution of antibiotic-resistant bacteria -- Introduction -- History of clinical antibiotic resistance -- Genetic mechanisms -- Natural ecology --Population genetics -- Applying evolution/approaches for the future --Conclusions -- Summary -- Acknowledgments -- 11 Pathogen evolution in a vaccinated world -- Introduction -- Vaccines have consequences for pathogen evolution -- Why has vaccination worked despite evolution? -- Pathogen adaptation in vaccinated populations --The health consequences of vaccine-adapted pathogens -- Predicting evolution -- Watching evolution -- Coda -- Summary --Acknowledgments -- 12 The evolution and expression of virulence --Introduction.

Outline of this chapter -- Defining virulence -- Artificial virulence evolution and live vaccines -- The three phases of the evolution of infectious diseases -- Mechanisms of virulence remain to be considered -- Variation of hosts impacts the expression and evolution of virulence -- Virulence has a direct benefit for the parasite -- Can we manage the evolution of virulence? -- Summary -- Acknowledgments -- 13 Evolutionary origins of diversity in human viruses -- Introduction -- Origins of human viruses -- Origins of diversity within human viruses -- Herpesviruses -- AIDS viruses -- Influenza A viruses --Dengue viruses -- Comparisons among viruses -- Summary -- 14 The population structure of pathogenic bacteria -- Introduction --Population structure -- Effective population size -- Helicobacter pylori -- Streptococcus pyogenes -- Salmonella typhi -- Further considerations -- Summary -- Acknowledgments -- 15 Whole-genome analysis of pathogen evolution -- Introduction -- Long-term evolution of pathogens -- Short-term evolution of pathogens -- Stochastic variation/hypermutability -- Summary -- Acknowledgments -- 16

Emergence of new infectious diseases -- Introduction -- Which diseases emerge? -- Disease emergence as a biological process -- Examples of emerging infectious diseases -- Practical implications of disease emergence -- Summary -- 17 Evolution of parasites -- Virulence and transmission in public health and evolution -- The evolution of virulence in control programs -- The problem of virulence -- The problem of the trade-off -- Beyond the trade-off model -- A molecular and an experimental approach to the evolution of parasites -- Summary -- Acknowledgments -- Part V: Noninfectious and degenerative disease -- 18 Evolutionary biology as a foundation for studying aging and aging-related disease -- Introduction -- Defining and measuring aging.

The canonical evolutionary models of aging -- Molecular mechanisms of aging -- Merging molecular mechanisms with evolutionary theory --Going beyond traditional evolutionary models of aging -- Concluding remarks -- Summary -- Acknowledgments -- 19 Evolution, developmental plasticity, and metabolic disease -- Introduction: diseases of excess or deficiency? -- The developmental origins of health and disease (DOHaD) paradigm -- Epigenetic mechanisms -- An integrated response to developmental cues -- A developmental and evolutionary synthesis -- Medical and public health implications --Summary -- Acknowledgments -- 20 Lifestyle, diet, and disease: comparative perspectives on the determinants of chronic health risks -- Introduction -- Evolutionary energetics -- Influence of lifestyle change on daily energy expenditure -- How changes in lifestyle influence energy intake and diet composition -- Health consequences of energy and nutritional imbalances -- Summary -- Acknowledgments -- 21 Cancer: evolutionary origins of vulnerability -- Introduction: a risky species? -- Evolutionary basis of vulnerability to cancer -- Lack of perfection in evolutionary engineering -- Evolutionary adaptation has 'no eyes to the future' -- The inevitability of natural selection -- The only evolutionary currency is reproductive success -- Implications --Summary -- Acknowledgments -- 22 Cancer as a microevolutionary process -- The concept of somatic evolution as a way of thinking about cancer -- Cancer initiation and chromosomal instability -- Chronic myeloid leukemia (CML) and resistance against small molecule inhibitors -- Conclusions -- 23 The evolutionary context of human aging and degenerative disease -- Introduction -- Aging as a byproduct of selection for reproductive performance -- Genes and aging -- Summary -- Acknowledgments -- References -- Index -- A -- B --C -- D.

Sommario/riassunto

A fully revised edition of a volume written by the world's leading authorities on this subject. It discusses how the evolution of humans and their pathogens have generated important medical issues, covering both infectious and degenerative diseases. It presents important ideas that are not yet sufficiently appreciated in the medical community.

E -- F -- G -- H -- I -- J -- K -- L -- M -- N -- O -- P -- Q -- R -- S

-- T -- U -- V -- W -- X -- Y -- Z.