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Titolo	Molecular Basis of Resilience : Adapting to a Changing Environment // by Patrick L. Iversen
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Descrizione fisica	1 online resource (325 pages)
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Nota di contenuto	Prologue -- Preface -- Social Entropy -- Virus among Us -- Non-linear Anomalies -- Bacterial Infectious Disease -- Cure 2000 -- Chemicals in the Environment -- Immune Defense -- Metabolic Defense -- Analog Genetics -- Eteplirsen -- Regulating Resilience.
Sommario/riassunto	This book illuminates mechanisms of resilience. Threats and defense systems lead to adaptive changes in gene expression. Environmental conditions may dampen adaptive responses at the level of RNA expression. The first seven chapters elaborate threats to human health. Human populations spontaneously invade niche boundaries exposing us to threats that drive the resilience process. Emerging RNA viruses are a significant threat to human health. Antiviral drugs are reviewed and how viral genomes respond to the environment driving genome sequence plasticity. Limitations in predicting the human outcome are described in "nonlinear anomalies." An example includes medical countermeasures for Ebola and Marburg viruses under the "Animal Rule." Bacterial infections and a review of antibacterial drugs and bacterial resilience mediated by horizontal gene transfer follow. Chapter 6 shifts focus to cancer and discovery of novel therapeutics for leukemia. The spontaneous resolution of AML in children with Down syndrome highlights human resilience. Chapter 7 explores chemicals in

the environment. Examples of chemical carcinogenesis illustrate how chemicals disrupt genomes. Historic research ignored RNA damage from chemically induced nucleic acid damage. The emergence of important forms of RNA and their possible role in resilience is proposed. Chapters 8-10 discuss threat recognition and defense systems responding to improve resilience. Chapter 8 describes the immune response as a threat recognition system and response via diverse RNA expression. Oligonucleotides designed to suppress specific RNA to manipulate the immune response including exon-skipping strategies are described. Threat recognition and response by the cytochrome P450 enzymes parallels immune responses. The author proposes metabolic clearance of small molecules is a companion to the immune system. Chapter 10 highlights RNA diversity expressed from a single gene. Molecular Resilience lists paths to RNA transcriptome plasticity forms the molecular basis for resilience. Chapter 11 is an account of ExonDys 51, an approved drug for the treatment of Duchenne muscular dystrophy. Chapter 12 addresses the question “what informs molecular mechanisms of resilience?” that drives the limits to adaptation and boundaries for molecular resilience. He speculates that radical oxygen, epigenetic modifications, and ligands to nuclear hormone receptors play critical roles in regulating molecular resilience.
