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Nota di contenuto	1. Introduction: Is Biological Robustness Unique? -- 2. Robustness, Mechanism, and the Counterfactual use of Goal-directedness in Biology (Marco Buzzoni) -- 3. Difference (Alfredo Marcos) -- 4. Robustness and Autonomy (Alvaro Moreno) -- 5. Robustness as an Explanandum and Explanans in Evolutionary Biology and Ecology (Philippe Hunemann) -- 6. Issues in Developmental Robustness (Manfred D. Laubichler) -- 7. Physical Robustness and Biological Robustness: Dynamical Rearrangement of Symmetry and Minimum Stimulus (Giuseppe Vitiello) -- 8. News from the ‘Twilight Zone’: Protein Molecules Between the Crystal and the Fluid (Alessandro Giuliani) -- 9. Robustness and Emergent Dynamics in Noisy Biological Systems (Simonetta Filippi) -- 10. Robustness in Neurological Systems (Sandra D. Mitchell) -- 11. Robustness Notions and Physiological Adaptability: Philosophical and

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Sommario/riassunto

This volume reviews examples and notions of robustness at several levels of biological organization. It tackles many philosophical and conceptual issues and casts an outlook on the future challenges of robustness studies in the context of a practice-oriented philosophy of science. The focus of discussion is on concrete case studies. These highlight the necessity of a level-dependent description of robust biological behaviors.Experts from the neurosciences, biochemistry, ecology, biology, and the history and the philosophy of life sciences provide a multiplex perspective on the topic. Contributions span from protein folding, to cell-level robustness, to organismal and developmental robustness, to sensorimotor systems, up to the robustness of ecological systems.Several chapters detail neurobiological case-studies. The brain, the poster child of plasticity in biology, offers multiple examples of robustness. Neurobiology explores the importance of temporal organization and multiscalarity in making this robustness-with-plasticity possible. The discussion also includes structures well beyond the brain, such as muscles and the complex feedback loops involved in the peculiar robustness of music perception. Overall, the volume grounds general reflections upon concrete case studies, opening to all the life sciences but also to non-biological and bio-inspired fields such as post-modern engineering. It will appeal to researchers, students, as well as non-expert readers.