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receptor clustering; Chapter summary; Further reading; 8 Accuracy of sensing; 8.1 Perfectly absorbing sphere; 8.2 Perfectly monitoring sphere; 8.3 Sensing with cell-surface receptors; Chapter summary; Further reading; 9 Motor impulse response; 9.1 Impulse response; 9.2 Time and frequency domains; 9.3 Minimal pathway model; 9.4 Linear response approximation; 9.5 Noise power spectra Chapter summaryFurther reading; 10 Optimization of pathway; 10.1 Optimal receptor-complex size; 10.2 Optimal adaptation dynamics; Chapter summary; Further reading; 11 "Seeing like a bacterium"; 11.1 Typical chemical gradients; 11.2 Weber's law; 11.3 Perception; 11.4 Fold-change detection; 11.5 Matching relations; 11.6 Predicting typical stimuli; Chapter summary; Further reading; 12 Beyond E. coli chemotaxis; Chapter summary; Further reading; Appendix More techniques; A.1 Derivation of the fluctuation-dissipation theorem; A.2 Variational principles and the Euler-Lagrange equation A.3 Gillespie simulationsA.4 Fokker-Planck approximation; A.5 Derivation of the Langevin noise; A.6 Time versus frequency domain; A.7 Model fitting to data; A.8 Principal component analysis; Chapter summary; Further reading; Index; A; B; C; D; E; F; G; H; I; L; M; N; O; P; Q; R; S; T; V; W

Sommario/riassunto

Although invisible to the bare eye, bacterial cells are large enough to make complex decisions. Cells are composed of thousands of different molecular species including DNA, proteins, and smaller molecules, allowing them to sense their environment, to process this information, and to respond accordingly. Such responses include expression of genes or the control of their movement. Despite these properties, a living cell exists in the physical world and follows its laws. Keeping this in mind can help answer questions such as how cells work and why they implement solutions to problems the way they

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Nota di contenuto	Front Cover -- The Material Geographies of the Belt and Road Initiative: Infrastructures and Political Ecologies on the New Silk Road -- Copyright Page -- Table of Contents -- List of Figures and Tables -- Notes on the Contributors -- Introduction: The World Transformed - Grounding the Belt and Road Initiative -- The new geography of the Belt and Road Initiative -- The BRI as territorial restructuring -- How the BRI is territorially restructuring the planet -- The need for a grounded approach to the BRI -- Critical approaches to the material transformations of the BRI -- Developing a critical research agenda -- The political ecologies and infrastructures of the BRI -- Note --

References -- 1 The Contested Coal-Fired Power in the Belt and Road Initiative: Indonesia as a Case Study -- Introduction -- Overview of Chinese investment in CFPPs in Indonesia -- Case studies -- Teluk Sepang power plant, Bengkulu -- Celukan Bawang power plant, Bali -- Sumsel-8 (Bangko Tengah) power plant, South Sumatra -- Coal-fuelled Indonesia Weda Bay Industrial Park, North Maluku -- Lessons for BRI governance: embodied energy justice and blue justice -- References -- 2 Dynamics of Grassroots Collectivism in Thailand's Special Economic Zones: Cases of Natural Resource Conflicts within the Belt and Road Initiative -- Introduction -- Development context of selected SEZ cases -- Chiang Khong SEZ in Chiang Rai provincial development context -- Nongkhai SEZ development context -- State-making through SEZ territorialization -- Grassroots movements against the SEZs -- Conclusion -- References -- 3 Railways of Hope, Railways of Conflict: Governance of the Domestic Environmental Impacts of a Belt and Road Project -- Introduction -- Environmental governance failure, scale and the political ecology of the BRI -- Railways of hope and a symbol of China-Laos friendship. Land use adjustment for railway occupation -- Water transfer project for water shortage -- Conclusion -- References -- 4 A Debt to Whom? The Nature Questions in Sino-Sri Lankan Development Narratives -- Introduction -- The political economy of Sino-Sri Lankan entanglements -- A debt to whom? The nature question in focus -- Debt-for-nature swaps and the promises of ecological futurity -- Conclusion -- References -- 5 Waiting, Acceleration, Stabilization: Polychronic Temporalities as Drivers of a Large-Scale Chinese Green Technology Project in Thuringia, Eastern Germany -- Introduction -- Time, temporalities and infrastructure -- The case of Arnstadt-Ichtershausen in Thuringia, Eastern Germany -- Entangled temporalities driving the deployment of CATL's gigafactory -- Waiting -- Acceleration -- Stabilization -- Conclusion -- Appendix -- References -- 6 Silk Road on Ice: Extractivism, Climate Change and Resistances -- Introduction -- Arctic colonialism and expansion of the Belt and Road on Ice -- Resistance to climate colonialism, extractivism and infrastructural 'off ice' necropolitics -- Conclusion -- Notes -- References -- 7 Donor Competition, Local Agency and Contingency: Jakarta-Bandung High-Speed Railway in Indonesia -- Introduction -- Pragmatic neutrality and donor competition in Jakarta-Bandung HSR -- Local agency in the Jakarta-Bandung HSR -- Conclusion -- Funding statement -- References -- 8 A Postcolonial Belt and Road Initiative? Dependency, Development and Geopolitics in China-Latin America Relations -- Introduction -- Commercial relationships -- Financial relationships -- Infrastructure and the BRI in Latin America -- Dependency, development and postcolonial relationships -- Conclusion -- References -- 9 The Elusive Rainbow at the End of the Belt and Road: Chinese Investment, Finance and Trade Controversies in Southern Africa. Introduction -- BRI reaches South Africa -- China's persistent overaccumulation of capital and the BRI as a spatial fix -- Contradictions reflected in South Africa's Chinese-driven special economic zones -- Infrastructure corruption amid growing coal-export dependency -- Conclusion -- Notes -- References -- 10 Beyond the Logistical Monolith: Multiplicity and Differentiation Along the Adriatic Corridor -- Introduction -- Global China in Piraeus and Trieste -- Port logistics -- New urbanizations -- Conclusion -- Note -- References -- 11 Capitalizing on the Logistical Future: Discounting Uncertainty in the Georgian Belt and Road Initiative -- A layering of projects -- A materialized bet on the future -- The labour of contracts -- Conclusion

-- Notes -- References -- 12 Infrastructure-Led Development, Urban Transformation and Inequality in China's Belt and Road Initiative: A Marxist Postcolonial Geographies Analysis -- Introduction -- Infrastructure-led development, urbanization and postcolonial geographies in the New Silk Road -- A tale of three cities -- Albert Royal Docks: building a (Chinese) city within the City of London -- Piraeus port in Athens, Greece: the head of the dragon -- Colombo Port City: Sri Lanka's 'new Dubai' -- The emerging urban geographies of the New Silk Road -- Conclusion -- Note -- References -- Afterword: The Material Futures of the Belt and Road Initiative -- Extractivist corridors -- Socio-environmental conflicts and environmental justice -- Uncertain futures -- Local agency, counter-movements and resistance corridors -- A comparative and community-engaged research agenda -- References -- Index.

Sommario/riassunto

China's Belt and Road Initiative (BRI), commonly called the New Silk Road, is a huge infrastructure project currently revitalising or creating new trading routes and large developments across the globe. It is estimated to cost up to US\$8 trillion and impact more than 65% of the world's population.
