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Soggetti	Analytical chemistry Biology—Technique Radiology Physiology Medicine—Research Biology—Research Analytical Chemistry Biological Techniques Biomedical Research Ronyó Fisiologia humana Imatges per ressonància magnètica Llibres electrònics
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Nota di contenuto	Recommendations for Preclinical Renal MRI: A Comprehensive Open-Access Protocol Collection to Improve Training, Reproducibility, and Comparability of Studies -- Animal Models of Renal Pathophysiology and Disease -- Preparation and Monitoring of Small Animals in Renal MRI -- Reversible (Patho-)Physiologically Relevant Test Interventions: Rationale and Examples -- Preparation of Ex Vivo Rodent Phantoms for Developing, Testing, and Training MR Imaging of the Kidney and Other Organs -- Quantitative Assessment of Renal Perfusion and Oxygenation by Invasive Probes: Basic Concepts -- Ultrasound and Photoacoustic

Imaging of the Kidney: Basic Concepts and Protocols -- Hardware Considerations for Preclinical Magnetic Resonance of the Kidney -- MRI Mapping of Renal T1: Basic Concept -- MRI Mapping of the Blood Oxygenation Sensitive Parameter T2* in the Kidney: Basic Concept -- Renal Diffusion Weighted Imaging (DWI) for Apparent Diffusion Coefficient (ADC), Intra Voxel Incoherent Motion (IVIM), and Diffusion Tensor Imaging (DTI): Basic Concept -- Dynamic Contrast Enhancement (DCE)-MRI Derived Renal Perfusion and Filtration: Basic Concepts -- Non-Invasive Renal Perfusion Measurement Using Arterial Spin Labelling (ASL) MRI: Basic Concept -- Renal pH Imaging Using Chemical Exchange Saturation Transfer (CEST)-MRI: Basic Concepts -- Sodium (²³Na) MRI of the Kidney: Basic Concept -- Hyperpolarized Carbon (¹³C) MRI of the Kidneys: Basic Concepts -- Functional Imaging Using Fluorine (¹⁹F) MR Methods: Basic Concepts -- MR Elastography of the Abdomen: Basic Concepts -- Monitoring Renal Hemodynamics and Oxygenation by Invasive Probes: Experimental Protocol -- Essential Practical Steps for MRI of the Kidney in Experimental Research -- Assessment of Renal Volume with MRI: Experimental Protocol -- Experimental Protocols for MRI Mapping of Renal T1 -- Experimental Protocols for MRI Mapping of the Blood Oxygenation Sensitive Parameters T2* and T2 in the Kidney -- Renal MRI Diffusion: Experimental Protocol -- Dynamic Contrast Enhanced (DCE)-MRI Derived Renal Perfusion and Filtration: Experimental Protocol -- Renal Blood Flow Using Arterial Spin Labeling (ASL)-MRI: Experimental Protocol and Principles -- Renal pH Mapping Using Chemical Exchange Saturation Transfer (CEST)-MRI: Experimental Protocol -- Sodium (²³Na) MRI of the Kidney: Experimental Protocol -- Hyperpolarized Carbon (¹³C) MRI of the Kidney: Experimental Protocol -- Fluorine (¹⁹F) MRI for Assessing Inflammatory Cells in the Kidney: Experimental Protocol -- Fluorine (¹⁹F) MRI to Measure Renal Oxygen Tension and Blood Volume: Experimental Protocol -- MR Elastography of the Abdomen: Experimental Protocols -- Subsegmentation of the Kidney in Experimental MR Images Using Morphology-Based Regions-of-Interest or Multiple-Layer Concentric Objects -- De-Noising for Improved Parametric MRI of the Kidney: Protocol for Non-Local Means Filtering -- Analysis Protocols for MRI Mapping of Renal T1 -- Analysis Protocols for MRI Mapping of the Blood Oxygenation Sensitive Parameters T2* and T2 in the Kidney -- Analysis of Renal Diffusion Weighted Imaging (DWI) Using Apparent Diffusion Coefficient (ADC) and Intra Voxel Incoherent Motion (IVIM) Models -- Analysis Protocol for Dynamic Contrast Enhanced (DCE)-MRI of Renal Perfusion and Filtration -- Quantitative Analysis of Renal Perfusion by Arterial Spin Labeling -- Analysis Protocol for the Quantification of Renal pH Using Chemical Exchange Saturation Transfer (CEST)-MRI -- Analysis Protocol for Renal Sodium (²³Na) MR Imaging -- Analysis Methods for Hyperpolarized Carbon (¹³C) MRI of the Kidney -- Data Preparation Protocol for Low Signal-to-Noise Ratio Fluorine-19 MRI.

Sommario/riassunto

This Open Access volume provides readers with an open access protocol collection and wide-ranging recommendations for preclinical renal MRI used in translational research. The chapters in this book are interdisciplinary in nature and bridge the gaps between physics, physiology, and medicine. They are designed to enhance training in renal MRI sciences and improve the reproducibility of renal imaging research. Chapters provide guidance for exploring, using and developing small animal renal MRI in your laboratory as a unique tool for advanced in vivo phenotyping, diagnostic imaging, and research into potential new therapies. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to

their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and thorough, *Preclinical MRI of the Kidney: Methods and Protocols* is a valuable resource and will be of importance to anyone interested in the preclinical aspect of renal and cardiorenal diseases in the fields of physiology, nephrology, radiology, and cardiology. This publication is based upon work from COST Action PARENCHIMA, supported by European Cooperation in Science and Technology (COST). COST (www.cost.eu) is a funding agency for research and innovation networks. COST Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation. PARENCHIMA (renalmri.org) is a community-driven Action in the COST program of the European Union, which unites more than 200 experts in renal MRI from 30 countries with the aim to improve the reproducibility and standardization of renal MRI biomarkers.
