
Preface

Several books are available that describe principles and methodology as well as applications of Magnetic Resonance Spectroscopy (MRS). However, these are, to the best of our knowledge, focused on adults. MRS in the pediatric population is different from adults for two main reasons. Particularly in the newborn phase, the brain undergoes biochemical maturation with dramatic changes of the “normal” biochemical fingerprint. Secondly, brain diseases in the pediatric population are different from adult disorders. Stroke, dementia, and brain tumors cover most of the abnormalities observed in the adult brain. This is in contrast to pediatrics, where the normal profile changes with age, tumors originate from many different cell types, inborn errors and leukodystrophies are encountered, and generally, injury in the context of ongoing brain development adds complexity to the interpretation of a study.

The basic physics of MRS is purposely kept concise to extent possible. This acknowledges the fact that improved hardware performance and convenient “push-button” setup of MRS on most modern clinical scanners allow any interested person to obtain good quality data. Thus, the target audiences for this book are not MR physicists but clinicians and researchers focusing on pediatric brain disorders. This includes radiologists, neurologists, neurooncologists, neurosurgeons, and more broadly the neuroscience and neurobiology community. The individual chapters selected for this book provide a comprehensive state-of-the-art overview of the findings and potential of MR spectroscopy for various pediatric brain diseases. This book also contains a large number of case studies, important for clinicians who may want to see example spectra for various conditions and want to use MRS as a tool to improve management of individual patients.

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