
Preface

Pain is a complex, multifactorial subjective and conscious experience; an interpretation of the nociceptive input influenced by memories, emotional, pathological, genetic, and cognitive factors. Resultant pain is therefore not always related linearly to the nociceptive drive or input, neither is it solely for vital protective function. By its very nature, pain is therefore difficult to assess, investigate, manage, and treat.

Until the advent of modern noninvasive human brain imaging methodologies about 20 years ago, our understanding of the role of the brain in pain processing was limited. In the last two decades, advances in brain imaging techniques have had a profound influence on our understanding of pain processing. In the early 1990s, human whole-brain functional imaging studies first showed multiple brain areas involved in pain processing, whereas other studies have revealed the involvement of forebrain neurotransmitters in pain modulation.

Recently, new advances in human brain imaging techniques allowed a better understanding of the functional connectivity in pain pathways, as well as the functional and anatomical alterations that occur in chronic pain patients. Modern imaging techniques have permitted rapid progress in the understanding of networks in the brain related to pain processing and those related to different types of pain modulation.

The future is bright for what brain imaging can contribute to our understanding of pain. Especially in combination with cellular, genetic, and molecular approaches, imaging techniques might have a major impact in the diagnosis and differentiation of chronic pain problems and the evaluation of the effectiveness of therapeutic interventions.

The purpose of this book is to cover all the imaging techniques and new exciting methods like new tracers, biomarker, metabolomic and gene-array profiling, together with cellular, genetic, and molecular approaches for the analysis of the pain with the most world renowned scientists in these fields.

Cagliari, Italy
November 2016

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Acknowledgements

It is not possible to overstate my gratitude to the many individuals who helped to produce this book. I would like to thank Gabriele Finco for the interesting discussions about the pain circuits and Paolo Siotto for the continuous support and many suggestions. Special thanks to my wife, *Tiziana*; without your continuous encouragement this book would not have been completed, I have to say that this is also your book! Thank you for your great work.

I also wish to thank all the authors who contributed with their effort to this book. I am very proud that most of them are young researchers who devoted their time to this project with enthusiasm. Without them nothing of this would have been possible.

I have received considerable support and cooperation from individual at Springer, particularly Gregory Baer. Thank you Greg, you have really helped to minimize the obstacles I have encountered during this project!

Cagliari, Italy
November 2016

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<http://www.springer.com/978-3-319-48044-2>

Neuroimaging of Pain

Saba, L. (Ed.)

2017, XIV, 508 p. 241 illus., 139 illus. in color.,

Hardcover

ISBN: 978-3-319-48044-2