The Marmoset Brain in Stereotaxic Coordinates

Xavier Palazzi · Nicole Bordier

The Marmoset Brain in Stereotaxic Coordinates

Xavier Palazzi
Biomatech
Chasse-sur-Rhône
France
x.palazzi@biomatech.fr

Nicole Bordier
Pfizer Amboise
France
nicole.bordier@hotmail.fr

ISBN: 978-0-387-78384-0 e-ISBN: 978-0-387-78385-7
DOI: 10.1007/978-0-387-78385-7

Library of Congress Control Number: 2008924611

© 2008 Springer Science+Business Media, LLC

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden.

The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights.

While the advice and information in this book are believed to be true and accurate at the date of going to press, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper
springer.com

Our families

*Our colleagues who helped building scientific
excellence at Pfizer Amboise during the last 30 years.*

Preface

Laboratory-bred common marmosets (*Callithrix jacchus*) have a natural lifespan in captivity in excess of 12 years, and their maximum longevity is more than 16 years. Due to its small size, its relatively easy adaptation to laboratory conditions and neuroanatomical similarities with human species, this animal is considered to represent a convenient primate model for neurosciences and drug development.

During our research and due to scarce available literature data in this species, a need for some support regarding the morphological interpretation of autoradiographic data and brain anatomy was raised. Based on existing stereotaxic equipment and technological skills, we decided to build a basic atlas of the marmoset brain in stereotaxic coordinates. Several technical difficulties were addressed, and the final document is now ready after 2 years of hard work. We hope this atlas will provide a comprehensive guide for those – researchers and undergraduates – interested in the marmoset brain, tissue target characterization and comparative anatomy. The nomenclature and atlas presentation were inspired from existing reference brain atlases in other species, and the quality of illustrations was achieved thanks to automated whole slide scanning.

We would be pleased to receive comments from the delineations we have made, so that continuous improvement could be made in future editions.

France
France

Xavier Palazzi
Nicole Bordier

Acknowledgements

We express our deep appreciation to Catherine George and Helmut Sterz for their support in a difficult operational environment.

We thank Diane Stephenson, Mike Rigby, Marie-Anne Colle, Marie-Thérèse Masson and Paul Deslex for their scientific help during the review process.

We are indebted to Christian Jobit and Pascal Brizard for their technical assistance.

We also thank all our colleagues from the pathology department for their daily support.

About the Authors

Dr. Xavier Palazzi is a senior veterinary pathologist currently working at Biomatech-NAMSA in France where he is in charge of evaluating the preclinical safety and efficacy of medical devices. He received his DVM from Lyon veterinary school in 1998 and his French certification in veterinary pathology in 2001. He then became a diplomate of the European College of Veterinary Pathology in 2003. Hired in 2004 by Pfizer Global R&D in Amboise (France), he was put in charge of Investigative Pathology until 2007 and developed stereotaxy combined with laser capture microdissection in the marmoset in order to measure mRNA expression of selected brain nuclei for some CNS projects.

Nicole Bordier is an experienced histotechnologist and electron microscopist. She was in charge of the resin laboratory in Drug Safety Research and Development at Pfizer Amboise (France) until 2008, where she developed expert techniques in neurobiology.

Contents

1. Introduction	1
2. Surgery and Stereotaxic Approach	1
3. Histology	3
3.1. Freezing	3
3.2. Sectioning	3
3.3. Staining	3
4. Data Capture	4
5. Reference Planes and Stereotaxic Accuracy	4
6. Nomenclature	5
7. List of Structures	5
8. Index of Abbreviations	8
9. List of Major Brain Areas	11
10. Conclusion	11
11. References	11
12. Plates	12