

Tumors of the Central Nervous System

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Non-Tumor Pathology*



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AFIP ATLASES OF TUMOR AND NON-TUMOR PATHOLOGY

Fifth Series
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TUMORS OF THE CENTRAL NERVOUS SYSTEM

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DEDICATIONS

To my father, Dr. Fabio Rodriguez, who inspired some of my first memories with his passion for normal and abnormal anatomy, before succumbing in the end to neurologic disease after a long courageous battle. My thoughts are with him as this project, which we anticipated and discussed through hard times, finally comes to life.

Fausto J. Rodriguez, MD



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Many individuals have influenced the authors' professional paths and have, directly or indirectly, contributed to this work.

We would first and foremost like to acknowledge the authors of the two prior editions of this fascicle—Drs. Bernd Scheithauer and Peter Burger—whose distinctive style, scholarly authority, and monumental contributions to diagnostic surgical neuropathology continue to resonate throughout these pages.

F.J.R. is especially grateful to the mentors and colleagues who have helped shape his career during his time at the Mayo Clinic and Johns Hopkins Hospital, including Drs. Caterina Giannini, Robert Jenkins, and Charles Eberhart, as well as the numerous bright trainees that have enriched his professional life.

C.E.H. would like to acknowledge past and current mentors and colleagues in neuropathology, neurosurgery, and neuro-oncology, including Drs. Larry Becker, Sukriti Nag, William Halliday, James Rutka, Annie Huang, and Uri Tabori who have both inspired and encouraged me throughout my career.

We are also deeply appreciative of Norm Barker, Professor of Pathology and Art as Applied to Medicine at Johns Hopkins, for his generous support and commitment. His expertise in photomicrography and the many collaborative and fun sessions we shared were instrumental in producing high-quality illustrations featured in this volume.

Finally, we are sincerely thankful to Dr. Sanda Alexandrescu, our primary reviewer, for her detailed and constructive suggestions, which greatly enhanced the final manuscript.

**Fausto J. Rodriguez, MD
Cynthia E. Hawkins, MD, PhD**

EDITOR'S NOTE

The Atlases of Tumor Pathology have a long and distinguished history. They were first conceived at a cancer research meeting held in St. Louis in September 1947, as an attempt to standardize the nomenclature of neoplastic diseases. The first series was sponsored by the National Academy of Sciences-National Research Council. The organization of this formidable effort was entrusted to the Subcommittee on Oncology of the Committee on Pathology, and Dr. Arthur Purdy Stout was the first editor-in-chief. Many of the illustrations were provided by the Medical Illustration Service of the Armed Forces Institute of Pathology (AFIP), the type was set by the Government Printing Office, and the final printing was done at the Armed Forces Institute of Pathology. The American Registry of Pathology (ARP) purchased the Fascicles from the Government Printing Office and sold them virtually at cost. Over a period of 20 years, approximately 15,000 copies each of nearly 40 Fascicles were produced. The worldwide impact of these publications over the years has largely surpassed the original goal. They quickly became among the most influential publications on tumor pathology, primarily because of their overall high quality, but also because their low cost made them easily accessible the world over to pathologists and other students of oncology.

Upon completion of the first series, the National Academy of Sciences-National Research Council handed further pursuit of the project over to the newly created Universities Associated for Research and Education in Pathology (UAREP). The Second Series was started, generously supported by grants from the AFIP, the National Cancer Institute, and the American Cancer Society. Dr. Harlan I. Firminger became the editor-in-chief and was succeeded by Dr. William H. Hartmann. The Second Series Fascicles were produced as bound volumes instead of loose leaflets. They featured a more comprehensive coverage of the subjects, to the extent that the Fascicles could no longer be regarded as "atlases" but rather as monographs describing and illustrating in detail the tumors and tumor-like conditions of the various organs and systems.

Dr. Juan Rosai was appointed as editor-in-chief of the Third Series, and Dr. Leslie Sobin became associate editor. A distinguished Editorial Advisory Board was also convened, and these outstanding pathologists and educators played a major role in the success of this series, the first publication of which appeared in 1991 and the last (number 32) in 2003.

The same organizational framework applied to the Fourth Series, meticulously edited by Dr. Steven Silverberg with Dr. Ronald DeLellis as the associate editor. With UAREP and AFIP no longer functioning, ARP remained the responsible organization. The Fourth Series volumes were hardbound with illustrations almost exclusively in color. There was also an increased emphasis on the cytopathologic (intraoperative, exfoliative, or fine needle aspiration) and molecular features that are important in diagnosis and prognosis. At the time of the Fourth Series, ARP also produced

Atlases of Non-Tumor Pathology; these volumes were numbered separately from the tumor volumes.

As in the prior series, the goal of the Fifth Series includes a continuous attempt to correlate, whenever possible, the nomenclature used in the Fascicles with that proposed by the World Health Organization Classification of Tumors, as well as to ensure a consistency of style. Including molecular diagnostics is more important than ever, as is the availability of an online component, a more nimble website (www.arppress.org), and a social media presence. Now in this series, the tumor and non-tumor volumes are combined and consecutively numbered as the Atlases of Tumor and Non-Tumor Pathology. Close cooperation between the various authors and their respective liaisons from the Editorial Board will continue to be emphasized in order to minimize unnecessary repetition and discrepancies in the text and illustrations.

Particular thanks are due to the members of the Editorial Advisory Board, our reviewers, the editorial and production staff, and the individual Fascicle authors for their ongoing efforts to ensure that this series is a worthy successor to the previous four.

Jason L. Hornick, MD, PhD



PREFACE

It is difficult to believe that nearly 18 years have passed since the publication of the previous edition of the AFIP Fascicle on Tumors of the Central Nervous System. In that time, impactful discoveries, evolving diagnostic classifications, and rapid technical advances have significantly reshaped the field—contributing, in part, to the delay in completing this new edition.

In the spirit of the original series, we have strived to keep diagnostic pathology at the core of the discussion, supported by a wide array of illustrative material. Our goal has been to support the practicing diagnostic pathologist who encounter these tumors and pseudoneoplastic conditions in daily practice, and in doing so, to make a meaningful contribution to the care of patients we are privileged to serve.

Of course, our understanding of brain tumor biology and pathology continues to evolve at a rapid pace. Ongoing refinements in classification and prognostication will no doubt lead to further revisions in the foreseeable future.

Fausto J. Rodriguez, MD
Cynthia E. Hawkins, MD, PhD



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