

Targeting DNA Topoisomerases - Past and Future

Guest Editors:

**Prof. Robert C.A.M. van
Waardenburg,**

Department of Pharmacology
and Toxicology, University of
Alabama at Birmingham,
Birmingham, AL, USA.

Email: rwanwaar@uab.edu

Website:

<https://www.uab.edu/medicine/pharmacology/faculty/van-waardenburg>

**Prof. William Henry
Gmeiner**

Department of Cancer
Biology, Wake Forest University
School of Medicine, Winston-
Salem, NC, USA.

Email:

jb.gmeiner@wakehealth.edu

Website:

<https://www.wakehealth.edu/Faculty/Gmeiner-William-Henry.htm>

Special Issue Introduction

DNA topoisomerases regulate the topological state of DNA in cells, including both genomic and mitochondrial DNA in eukaryotic cells. Due to their essential function for replication, transcription, and genome stability, these enzymes have been the subject of intensive mechanistic investigations. These studies revealed DNA topoisomerase (Top) enzymes form covalent reaction intermediates (i.e. cleavage complexes) with the DNA substrate, and they became a target for successful drug development programs that resulted in FDA-approved anti-cancer agents including topotecan (targeting Top1 covalent complexes) and doxorubicin, which targets Top2-DNA adducts in eukaryotic cells. Top poisons interfere in critical biological processes, including replication fork progression and chromosome segregation, but they also induce DNA repair mechanism to remove these protein-DNA complexes and DNA strand breaks. While Top1 and Top2 poisons continue to have a major impact on cancer treatment, drug resistance has emerged as a significant clinical problem. In recent years, our understanding of topoisomerase biology and its regulation has greatly increased revealing greater complexity to the pathways that regulate DNA topology in eukaryotic cells and opening up new avenues for improved treatment and overcoming resistance. The special issue "Targeting DNA topoisomerases – past and future" will include Reviews and Commentaries updating the fundamental biology of topoisomerases, their regulation at the transcriptional and post-transcriptional levels, and their impact on clinical management of cancer. This special issue will also include Research articles presenting novel outstanding data on all aspects of topoisomerase biology or targeting topoisomerases for therapeutic purposes, especially cancer. All submissions will undergo rigorous peer revision and will be published free of charge upon acceptance.

Benefits

Rigorous mechanism in peer review: one manuscript must be reviewed by at least two experts in this field. We will ensure high standards for the review process and subsequent publication by a team of efficient and professional reviewers and scientific editors.

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