

ANTICANCER DRUGS TARGETING TUBULIN AND MICROTUBULES

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1 INTRODUCTION

Microtubules are filamentous intracellular structures that are responsible for several crucial aspects of cell morphology. They form the cytoskeleton in eukaryotic cells and are also responsible for various kinds of their movements because they are part of the cilia and flagella. They are rigid and relatively straight and serve as tracks to deliver vesicles and organelles to distal cellular regions. The integrity of microtubule structures is essential for cells to go through various cell cycle checkpoints because without it, programmed cell death or apoptosis is triggered. Finally, according to a controversial theory, consciousness depends on orchestrated coherent quantum processes in groups of microtubules within brain neurons.¹

Microtubules are hollow structures formed by 13 parallel protofilaments that grow and shorten by the reversible, noncovalent addition of tubulin dimers at their ends. Tubulin is a protein that contains two subunits called α and β in a head-to-tail arrangement. Microtubules and free tubulin dimers are