

Preface

Cancer is a multifaceted and genomically complex disease and intriguingly not an unfamiliar term for clinicians over centuries. Earliest evidence of cancer was discovered in human mummies and Egyptian hieroglyphs (ancient manuscripts). Certain hints have emerged pinpointing towards the presence of tumors in fossilized bones in ancient Egypt era. Biologists and archaeological researchers have collaboratively unraveled different mysteries and collected clues of bone cancer (osteosarcoma) in mummies. Egyptian history is unique in the sense that it opened new horizons for clinicians because oldest cancer description was discovered in Egypt (even though the term “cancer” was not coined) and dates back to about 3000 BC. The Edwin Smith Papyrus is doubtlessly the oldest known document on the surgery of trauma. It contained descriptions of eight cases of ulcers or tumors of the breast that were removed by cauterization technique. “Fire drill” was used as a tool for cauterization. Mechanistically enigmatic and therapeutically challenging nature of cancer was also described as the writing says about the disease, “There is no treatment.” Hippocrates (460–370 BC) was a Greek physician and considered as the “Father of Medicine.” *Carcinos* and *carcinoma* were the terms coined by Hippocrates for description of non-ulcer forming and ulcer forming tumors. *Carcinos* was a giant crab in Greek mythology and the term was used because finger-like projections appeared like a moving crab or legs of a crab. Evolutionary phase continued and different distinguished medical experts of their times made efforts to make the terms more specific, descriptive, and understandable. Translation of the Greek term into *cancer* was done by the Roman physician, Celsus (28–50 BC), because it was the Latin equivalent of crab.

Another Greek physician who contributed to the development of terminologies was Galen (130–200 AD) who used the word *oncos* (Greek for swelling) for description or explanation of tumors. Interestingly, the crab analogy of Hippocrates and Celsus is still in use in modern cancer biology for description of malignant tumors. Galen’s term has now become a part of the name for medical specialists who deal with cancer, “oncologists”.

Research over decades demystified underlying mechanisms and strategies to inhibit cancer progression and development. Overwhelmingly increasing high impact research work has substantially improved our understanding, and efforts are being made to identify anticancer agents with minimal off-target effects and remarkable clinical outcome. In this book we have attempted to put different pieces of jig-saw puzzle together to present an overview of rapidly developing knowledge and future challenges in the treatment of cancer.

The first chapter is focused on the use of vitamin D in the treatment of gynecological cancers. Dr. Rukset Attar has discussed most recent updates related to vitamin D as an effective agent against cancer. The next chapter is focused on microtubule binding agents and how synthetic and natural products can be used to target microtubules by Dr. Mohammad Rais Mustafa and team members.

Next, Dr. Catherine Ropert and her co-worker summarized the knowledge of MAPK inhibitors and how these inhibitors can be used in cancer therapy followed by a presentation by Dr. Manuel Freire-Garabal and colleagues who described how adenosine signaling pathway can be therapeutically exploited to treat prostate cancer.

Dr. Massimo Mallardo and his team set spotlight on the role of non-coding RNAs in molecular oncology and latest technologies which can be used to study the detailed role-play of these non-coding RNAs.

Exosome biology has also undergone substantial broadening, and it is evident that cancer cells secrete exosomes which transfer biological molecules to recipient cells. Dr. Chiara Martinelli impressively presented the use of exosomes as emerging biomarkers in cancer therapy.

Dr. Aliye Aras Perk and colleagues shared most current knowledge related to strategies to target EGFR-mediated signaling for the treatment of hepatocellular carcinoma. Dr. Evren Ucar advocated the use of natural products to target heat shock proteins in different cancers. Dr. Maria Gasparri shared expert opinion about the immunobiology of cancer.

Dr. Satoshi Inoue provided in-depth analysis of deregulated androgen receptor signaling in prostate cancer. It is well established that androgen receptor has evolved different adaptive mechanisms to overcome rapidly declining androgen levels in patients treated with androgen inhibitors.

Dr. Wensi Tao comprehensively reviewed underlying mechanisms, clinical background of adenoid cystic carcinoma of the lacrimal gland, and how patients will benefit from a greater understanding of the disease. Dr. Agnieszka Sobczak-Kupiec and colleagues shared views about latest advancements in the delivery of anticancer agents (TRAIL and miR-34a) using nanotechnological strategies.

Dr. Xiukun Lin and his team summarized the most recent findings related to bioactive molecules from traditional Chinese medicine reportedly involved in the inhibition of frequently deregulated protein kinases in different cancers. The last chapter, contributed by Dr. Yi Liu, provides most recent updates on the use of natural products for the treatment of inflammation-induced cancer.

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