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**Biochemical Oncology for Personalized and  
Precision Medicine**

Nadia Hamdy



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## Biochemical Oncology for Personalized and Precision Medicine

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### ABSTRACT

Still cancer treatment is a major challenge to Health Care Sustainability (Egypt Vision 2030). Chemotherapy normo-toxicity as well as multidrug cancer cell resistance raise the debate of “Die Another Day” or “Die Another Way”. This mandates identification of chemo-preventive and/or chemo therapeutic agent(s) that can target most, if not all, “Cancer Hallmarks”, translated into “Drug-Resistance Hallmarks”, in a way that regulates the proliferation of unwanted cancer cells, with minimal side effects or multi-organ toxicity, with prolonged overall survival.

This can be achieved via cutting-edge research such as site-specific delivery cargos, specific *rocket targeting* using nanotechnology, the use of natural compounds and drug repurposing. This would achieve a green environment in drug design and development, which is the central focus of “Biochemical Oncology Field” for cancer management. This includes cell signaling pathways, maintaining a balance between cell proliferation and death, stemness of cancer cells, epithelial-mesenchymal transition, dysregulation of the cell cycle, tyrosine kinase growth factor signaling pathways. Understanding of these biochemical signatures in cancer would open a new avenue to control altered drug metabolism, featured by “Tumor Micro-Environment”.

Keeping in mind, first, that no single drug can target all cancer hallmarks, affect drug metabolism, drug resistance. Second, no single treatment can target all cancer types or can fit all cancer patients or even one patient with a variety of concomitant diseases or different environmental stressors! Hence, the design and production of chemo-preventive agents acting on these particular molecular targets are of great interest for *cancer treatment personalization and precision medicine* (Figure 1).

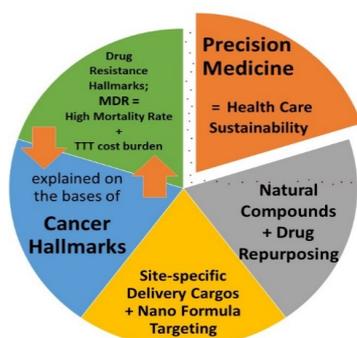


Figure 1. A sketch suggesting how biochemical oncology can target different hallmarks of cancer microenvironment

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### **Egyptian Association for Cancer Research (EACR)**

<http://eacr.tanta.edu.eg/>

EACR is an NGO society that was declared by the Ministry of Social Solidarity (Egypt) No. 1938 in 19/11/2014 based on the initiative of Prof. Mohamed Labib Salem, the current Chairman of EACR. EACR aims primarily to assist researchers, in particular young researchers in the field of cancer research through workshops, seminars and conferences. Its first international annual conference entitled "Anti-Cancer Drug Discovery" was successfully organized in April 2019 (<http://acdd.tanta.edu.eg>). Additionally, EACR aims to raise the awareness of the society about the importance of scientific research in the field of cancer research in prediction, early diagnosis and treatment of cancer. EACR is also keen to outreach the scientific community with periodicals and news on cancer research including peer-reviewed scientific journals for the publication of cutting-edge research. The official scientific journal of EACR is "International Journal of Cancer and biomedical Research (IJCBR: <https://jcbjournals.ekb.eg>) was successfully issued in 2017 and has been sponsored by the Egyptian Knowledge Bank (EKB: [www.ekb.eg](http://www.ekb.eg)).

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