Pathogenetic Mechanisms & Personalized Therapeutic Approaches: What's the Role of EM

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Abstract

Postgenomics is rapidly changing the health industry in such that it allows for the rapid implementation of predictive and personalized medicine. The secular paradigm «one drug fits all» is wrong. The new sequencing technologies allow us to move towards what is today called P4 medicine: Predictive, Preventive, Personalized and Participatory. Utilizing molecular analyses of the genome it is possible to classify patients into subgroups related to morpho-functional features obtained by different techniques and methods. In this way, for example, different groups of patients can be identified: those who will not respond to a treatment, those for whom the treatment will be toxic, and finally those who will tolerate the treatment. The ability to identify biomarkers for the stratification of patients represents the next great challenge in the race to improve the quality of treatment and realise precision medicine (1). This will be possible due to newest instrumental technologies and specimen preparation techniques (2). Liquid biopsy would be defined as obtaining circulating cancer cells, tumor-derived cell free DNA (cfDNA) or other compounds in body fluids such as microvesicles and exosomes, collectively referred to extracellular vesicles, submicron-sized lipid containers released by cells. Genetic disease study must be developed following many steps which consist by identification of the disease causing gene till the definition of the molecular pathways which are the basis of the pathogenetic mechanism allowing to the new therapeutic approach. Electron microscopy can play a key role in the definition of these mechanisms aimed at showing the subcellular alterations due to gene abnormalities (3,4). One of the most recent application of this role has been defined during the SARS CoV2 pandemic to understand the specific infectious mechanism and tissues alterations (5).

References

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