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Integrative data approaches towards a personalized prevention of cancer: The epidemiological vision

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Abstract

Disease prevention can highly benefit of a personalized medicine approach through the



accurate discrimination of individuals at high risk of developing a specific disease from those at moderate and low risk. To this end precise risk prediction models need to be built. This endeavour requires a precise characterization of the individual exposome, genome, and phenome. Massive molecular omics data representing the different layers of the biological processes of the host and the non-host will enable to build more accurate risk prediction models. Epidemiologists aim to integrate omics data along with important information coming from other sources (questionnaires, candidate markers) that has been proved to be relevant in the risk assessment of complex diseases.

The vast proportion of pancreatic cancer is named sporadic because it does not aggregate within families and its aetiology is complex. Both genetic and non-genetic factors have been associated with sporadic pancreatic cancer though the magnitude of their risk is small/moderate. Therefore, cost-efficient primary and secondary prevention programs for sporadic pancreatic cancer should be based on multifactorial integrative scores to define high-risk populations. Steps towards the integration of omics and non-omics factors selected through an appropriate methodology are ongoing using the PanGenEU study resources. However, the integrative models in large-scale epidemiologic research still face numerous challenges, some of them at the analytical stage. I will comment on the efforts we do to better characterize pancreatic cancer risk factors and the strategies we plan to apply to build integrative predictive risk scores.

Short bio



Dr. Núria Malats is currently the head of the Genetic and Molecular Epidemiology Group at the Spanish National Cancer Research Centre (CNIO), Madrid, Spain. She has a broad expertise in these fields of research by focusing mainly on bladder and pancreas cancer. She coordinates several large national and international studies integrating different levels of information, including omics data, in both disease development and progression. She has over 250 publications and is external reviewer of national and international funding agencies and first rank scientific journals. Dr. Malats has been a board member of ESUR and of the EAU Research Foundation, she chaired the EUPancreas COST Action (BM1204), is a board member of the International Pancreatic Cancer Case Control Consortium (PanC4), and the chair of the Research Work Stream of Pancreatic Cancer Europe (PCE) multistakeholder platform.