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4th International Conference on
GASTROENTEROLOGY AND HEPATOLOGY
&
9th World Congress on
CLINICAL PHARMACY & PHARMACY PRACTICE

March 25-26, 2019 | Amsterdam, Netherlands

Arch Gen Intern Med 2019, Volume 3 | DOI: 10.4066/2591-7951-C1-024

MSI CANCER: FROM GENOMICS TO PERSONALIZED MEDICINE

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The human tumor phenotype referred to as MSI (Microsatellite Instability) arises because of defects in the DNA mismatch repair (MMR) system. MSI was first observed in inherited tumors associated with Lynch syndrome and later in approximately 10-15% of sporadic colon, gastric and endometrial cancers, as well as in a small proportion (1-5%) of many other primary tumour types. The normal function of the MMR system is to recognize and repair the errors that arise during DNA replication, as well as to repair some forms of DNA damage. It is now well established that MMR deficiency is not in itself a direct transforming event and that MSI tumors develop through a distinctive molecular pathway characterized by the genetic instability of numerous microsatellite repeated sequences throughout the genome. These mutations accumulate in tumor cells together with other somatic alterations at non-repetitive DNA sequences. The overall aim of our research team is to decipher the important genomic and pathophysiological aspects of MSI carcinogenesis and to benefit from our findings to open perspectives for the precision medicine of MSI cancer. The overall aim of my talk will be to describe some important pathophysiological aspects of MSI carcinogenesis, reporting how the investigation of mechanisms underlying MSI-driven tumor development has also led us to identify diagnostic tools, risk factors, prognostic biomarkers, and new targets for personalized treatments of patients suffering from MSI tumors.

Note: