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Alteration of circulating microRNAs to predict lymphoma initiation and progression via a systems biology approach

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Extensive epidemiological data have demonstrated an exponential rise in the incidence of non-Hodgkin lymphoma (NHL) that is associated with increasing age, starting from young adulthood. The molecular etiology of this remains largely unknown. We propose that there are predictable, age-dependent circulating microRNA (miRNA) signatures in the blood that influence NHL initiation and progression. To investigate this we utilized a novel murine model for spontaneous DLBCL initiation at two age groups: 2 and 15 months old. All spontaneous DLBCL mice will start to develop visible tumors starting at 15 months of age. Using systems biology techniques we determined a list of 10 circulating miRNAs present in the blood of DLBCL forming mice that are not present in the wild-type mice starting from 2 months of age. Additionally, this miRNA signature heavily impacts JUN and MYC on genetic signaling. It was determined that there is a key miRNA signature circulating throughout a host prior to the formation of a tumor. This miRNA signature is further modulated by age and the formation of tumors. Leveraging a novel spontaneous DLBCL murine model, we were able to determine an age-based key functional circulating miRNA signature associated with NHL that occurs in the blood. This age based circulating miRNA signature can be used to predict NHL development at a young age before actual tumor formation. Furthermore, this can potentially be used as a simple biomarker at a young age to predict future lymphoma development and allow for advanced novel therapeutic strategies to prevent lymphomagenesis.

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The role of radiology in diagnosis and treatment, a non-vascular approach

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Radiology is a rapidly growing and updating field of medicine with increasing potentials. Many diseases could be monitored, diagnosed and sometimes treated in radiology departments. Accurate surgical access could be planned easier using medical imaging and now even non-surgical intervention and impossible surgically access became possible. In this article we discuss non vascular intervention using medical imaging. Some cases might be diagnosed from their typical radiographic appearance. Many cases can be diagnosed accurately by conjunction of different imaging modalities as in breast imaging when using mammography in conjunction with ultrasound and if then necessary might use also breast MRI and MRI spectroscopy if needed to reduce unnecessary surgery or unnecessary further intervention. Many cases could be also diagnosed using imaging guided intervention and are minimally invasive , lower risk and faster recovery for the patients using percutaneous biopsy or fine needle aspiration or even fine needle non aspiration. Many diseases are now treated using interventional imaging guidance such as alcohol ablation, phenol injection for nerves, cysts and tumors. Radiofrequency ablation can be used for tumors, congenital lesions, intradiscal or nerve ablation in patients with chronic pain. Microwave or cryoablation may be used for tumor treatment and are also widely used now. Imaging guided injections with autologous blood, PRP (platelet rich plasma), lidocaine and corticosteroids, prolotherapy. Relieve signs of serious problems such as nephrostomy and ureteric stenting for hydronephrosis due to stones, tumors or pelvi ureteric stenosis, biliary drainage and stenting for biliary stones, strictures or tumors. There is also a very huge branch in diagnosis and treatment using vascular intervention that is not discussed here.

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