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| Clinical Utility of Molecular Testing in  the Investigation of Eosinophilia  Diagnostic utility  Hypereosinophilia (≥1.5 x 109/L) and hypereosinophilic syndrome (HES, with evidence of organ dysfunction) have varied aetiologies including secondary (reactive), primary (clonal) and idiopathic1,2.  Eosinophilia is most commonly reactive (e.g. allergy, infection, autoimmune disease, medications etc*.*) and therefore reactive causes should generally be excluded prior to investigation of a haematological neoplasm.  A number of haematological neoplasms may be accompanied by an eosinophilia in which the eosinophils are part of the neoplastic clone. Additionally, eosinophilia may be reactive (non-clonal) to an underlying haematological or solid organ malignancy.  Myeloid/lymphoid neoplasms with eosinophilia and gene rearrangement is a provisional entity in the WHO revised 4th edition3. This is most commonly due to a *PDGFRA* rearrangement (usually *FIP1L1-PDGFRA* gene fusion), which is typically sensitive to imatinib.  Less commonly gene rearrangements of *PDGFRB* or *FGFR1*,as well as *PCM1-JAK2*, *ETV6-JAK2* or *BCR-JAK2* and more rarely mutations, result in aberrant expression of a tyrosine kinase and frequently, but not always eosinophilia3. These rearrangements may be detected by cytogenetics, FISH and/or RT-PCR.  Eosinophilia may be associated with both myeloid and lymphoid neoplasms. In the appropriate clinicopathological context, consider testing for *BCR-ABL1* (CML), *JAK2/CALR/MPL* (classic MPN), *KIT* (systemic mastocytosis), t(8;21) or inv(16) (AML) or another clonal marker (chronic eosinophilic leukaemia).  While somatic mutation detection is one of the diagnostic criteria for chronic eosinophilic leukaemia, NOS, it is important to exclude all possible reactive causes of eosinophilia before making this diagnosis as many myeloid mutations are also observed in age-related clonal haematopoiesis3,4.  References  **1.** Butt NM, et al. Guideline for the investigation and management of eosinophilia. *British Journal of Haematology* 2017; **176**(4): 553-72. **2.** Klion A. Hypereosinophilic syndrome: approach to treatment in the era of precision medicine. *Hematology Am Soc Hematol Educ Program* 2018; **2018**(1): 326-31. **3.** Swerdlow SH CE, Harris NL, Jaffe ES, Pileri SA, Stein H, Thiele J. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues (revised 4th edition). Lyon: IARC; 2017. **4.** Jaiswal S, et al. Age-related clonal hematopoiesis associated with adverse outcomes. *N Engl J Med* 2014; **371**(26): 2488-98. |