A classification of myelodysplastic syndromes that aids clinical decision-making

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Myelodysplastic syndromes (MDS) are myeloid neoplasms characterized by ineffective erythropoiesis, peripheral cytopenia, and a variable risk of progression to acute myeloid leukemia (AML). In the last 15 years, our understanding of these disorders has advanced substantially with the use of massively parallel DNA sequencing methods in translational studies. This has enabled the development of novel diagnostic and prognostic approaches and has also promoted innovative clinical trials aimed at defining precision treatments. An abundance of clinical and biological data is currently being collected on individual patients. Interpreting these data and navigating the genomic complexity of MDS represents an increasing challenge for clinicians. Current classifications of MDS and related disorders account for only a minor portion of genomic data. Exploiting artificial intelligence and machine learning to take advantage of genomic characterization becomes mandatory: the final objective of a mechanistic classification is to best inform clinical decision-making. This requires international collaboration, the creation of knowledge banks, the preparation of web portal tools, and the conduction of clinician-driven clinical trials.