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## **Application of DNA molecular markers for cultivar authentication and IP protection**

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**Abstract:** Cannabis characterization and stocking are key problems for the industry. Agronomical and morphological descriptions are not very reliable since they are highly dependent on environmental conditions and depend on the interpretation of the lab scientist. Molecular identification is the preferred tool for taxonomy identification. Growers and nurseries buy seeds and plants to propagate and grow them in their facilities. However, it is necessary to assess the genetic authenticity and genetic traceability of the origin of the real plant or food products. Cultivar identification by DNA molecular markers is very successful for this purpose. It has been demonstrated in plants and animals that low-density DNA panels (1000- 5000 SNPs) are an efficient way to reduce the high cost of high-density SNP panels (>10.000). In addition, high-density SNP arrays make difficult the conversion to an efficient QR code or barcode. Furthermore, it has been demonstrated no significant differences between low- and high-density panels for cultivar identification and for protection of the breeder's rights. We sequenced the whole genome of 30 cultivars. After applying stringent bioinformatic tools, we retrieved the best thousands of SNP markers which were printed on a DNA chip. Nurseries and farms are using it for ancestry analysis as well as paternity tests, preservation and distribution of the plant material, marketing, authentication, and IP of germplasm. MyFloraDNA is the first group that has patented a technology where molecular markers are translated and converted into a graphical representation, which can be included in any labeling product as a proof of authentication.