

Chromosomal DNA Measurement - IMAGE CYTOMETRYA Version 2

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Abstract

The DNA amount can be measured for each chromosome of the karyotype by image cytometry. Image cytometry (ICM) associates microscopy, digital image and software technologies and has been particularly useful in spatial and densitometric cytological analyses. ICM integrates the methodologies of microscopy optical calibration, standard density filters, digital CCD camera and image analysis softwares for quantitative applications. Besides of all system calibration and setup, cytological protocols must perform good slide preparations for efficient and reliable ICM analysis.

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Guidelines

Silva JC, Carvalho CR, Clarindo WR (2018) Updating the maize karyotype by chromosome DNA sizing. PLoS ONE 13(1): e0190428. https://doi.org/10.1371/journal.pone.0190428

Abreu IS, Carvalho CR, Clarindo WR (2008) Chromosomal DNA content of sweet pepper determined by association of cytogenetic and cytometric tools. Plant Cell Reports 27(7): 1227–1233. https://doi.org/10.1007/s00299-008-0539-4

Carvalho CR, Clarindo WR, Abreu IS (2011) Image cytometry: nuclear and chromosomal DNA quantification. In: Chiarini-Garcia H, Melo RCN (Eds) Light microscopy: methods and protocols. Humana Press, New York, USA, 51–68. https://doi.org/10.1007/978-1-60761-950-5_4

Chieco P, Jonker A, Van Noorden CJF (2001) *Image cytometry: Microscopy handbooks 46.* Springer-Verlag, New York, 128 pp.

Doležel J, Bartoš J (2005) Plant DNA flow cytometry and estimation of nuclear genome size. Ann Bot 95:99-110

Doležel J, Bartoš J, Voglmayr H, Greilhuber J (2003) Nuclear DNA and genome size of trout and human. Cytometry 51:127-128

Greilhuber J (2005) Intraspecific variation in genome size in Angiosperms: identifying its existence. Ann Bot 95:91-98

Greilhuber J, Ebert I (1994) Genome size variation in Pisum sativum. Genome 37:646-655

Hardie DC, Gregory TR, Hebert PDN (2002) From pixels to picograms: a beginners' guide to genome quantification by Feulgen image analysis densitometry. J Histochem Cytochem 50:735-749

Vilhar B, Dermastia M (2002) Standardization of instrumentation in plant DNA image cytometry. Acta Bot Croat 61:11-26

Vilhar B, Greilhuber J, Koce JD, Temsch EM, Dermastia M (2001) Plant genome size measurement with DNA image cytometry. Ann Bot 87:719-728

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