



Metakaryotic organogenic stem cells: human clinical studies point to agricultural targets

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The discovery of metakaryotic stem cell in human cancers and metastasis in 2003 led to finding 'common' drugs that kill cancer stem cells. Successful completion of a clinical trial in 2019 provided the first 'proof of concept'.

Metakaryotic stem cells are the predominant form of stem cells in human fetal organogenesis, wound healing and several pathologies, especially carcinogenesis. They have been similarly found in experimental animals and, relevant here, plants. Findings to date raise the reasonable question: "Are there useful targets - *possible targets* - in agriculture?" Dr. Gostjeva will discuss the comparative cell physiology of meta-karyotes versus 'eu-karyotes'. She will outline specific methods of tissue preparations for metakaryotic cells identification in a variety of species/organs as well as new histology, microscopy platforms under development at MIT to extend observations of stem cells in plant developmental biology. Fundamentals of metakaryotic stem cells symmetrical and asymmetrical divisions ('Watson – Crick' DNA strands *paradox*) will be presented in the light of the possibility to develop molecular probes specific to metakaryotic stem cells in any agriculturally-important plant. Issues of metakaryotic cells' sensitivity to common drugs and other bioactive compounds will be covered, looking ahead to development of (a) a new generation of herbicides targeting weedy plant organogenesis stem cells that are more safe for humans than 'traditional' herbicides, (b) new concepts in medicinal plant biotechnology.

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