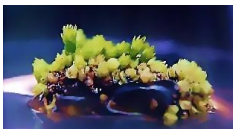
# Prof. Dr. Normah Mohd. Noor

Principal Research Fellow

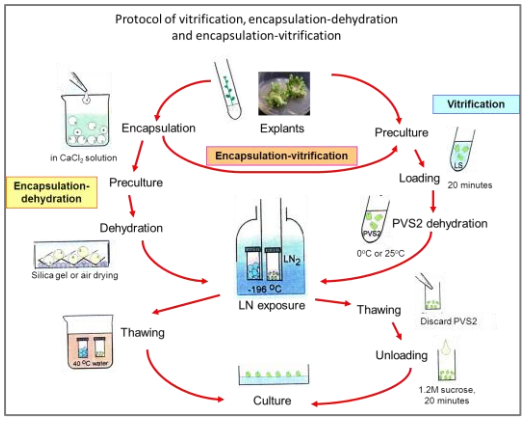
Plant Tissue Culture and Cryopreservation

Recalcitrant Seed

Prof. Dr. Normah Mohd. Noor is a Founding Director of Institute of Systems Biology (2005-2014). Her groundbreaking work leading to the development of a technique for the cryopreservation of embryonic axes of rubber represented seminal work in the cryopreservation of recalcitrant seeds. Her research on cryopreservation and conservation of tropical recalcitrant fruit species, particularly of *Garcinia*, *Citrus* and *Nephelium*, has led to the development of techniques for the long-term conservation and micropropagation of these economically (and traditionally) important species. These studies are published in highly rated international journals.



Studies in her laboratory elucidated culture techniques for a wide array of tropical fruit. Although cryoconservation techniques have been developed for many species, there is no successful technique or protocol for some species with highly recalcitrant seeds. Her research continues to understand recalcitrant seed behaviour by using a systems biology approach. Prof. Normah has expanded research in her laboratory to include the broad areas of genetic diversity, developmental biology, molecular biology and metabolomics. These are the newest cutting edge areas for cryopreservation and genetic resources preservation.

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Selected Publications

1. Makeen, M.A., **M.N. Normah**, S. Dussert & M.M. Clyde, 2007. The influence of desiccation and rehydration on the survival of polyembryonic seed of *Citrus suhuiensis* cv limau madu. *Sci. Hortcult.* **112:**376-381
2. **Normah M.N.** 2011. *In vitro* conservation of Malaysian biodiversity – achievements, challenges and future directions. **Invited review**. *In Vitro Cellular & Developmental Biology* – Plant, 47:26–36.DOI 10.1007/s11627-010-9306-7, published online: 14 September 2010
3. Elviana M., R.R. Emelda, I. Ismanizan & **M.N. Normah.** 2011. Morphological and histological changes during the somatic embryogenesis of mangosteen. Biologia Plantarum **55**(4):731-736 *Biologia Plantarum* (55 (4): 731-736)
4. Omar M. Al Zoubi[1] and **Normah M. N. 2012.** Desiccation sensitivity and cryopreservation of excised embryonic axes of *Citrus suhuiensis* cv. limau madu, citrumelo (*Citrus paradisi* Macf. × *Poncirus trifoliata* (L.) Raf and *Fortunella polyandra.* CryoLetters **33** (3), 240-250
5. Emelda Rosseleena Rohani, Ismail Ismanizan and **Normah Mohd Noor**. **2012**. Somatic embryogenesis of mangosteen. Plant Cell Tiss Organ Cult 110(2): 251-259, DOI 10.1007/s11240-012-0147-4
6. Sarah Ibrahim & M. N. Normah. 2013. The survival of in vitro shoot tips of *Garcinia mangostana* L. after cryopreservation by vitrification Plant Growth Regul 70:237–246. DOI 10.1007/s10725-013-9795-6
7. Khairunisa Khairudin, Nur Afiqah Sukiran, Hoe-Han Goh, Syarul Nataqain Baharum, **Normah Mohd Noor**. 2014. Direct discrimination of different plant populations and study on temperature effects by Fourier transform infrared spectroscopy. Metabolomics 10:203-211. DOI10.1007/s11306-013-0570-5
8. **Normah Mohd Noor**. 2014. Using Systems Biology to solve the riddle of recalcitrant tropical plants. *ISHS Acta Horticulturae 1039:211-217*
9. Omar M. Al Zoubi & **Normah Mohd Noor**. 2015 Critical moisture content for successful cryopreservation of embryogenic axes of *Fortunella polyandra* determined by differential scanning calorimetry (DSC). *Acta Physiologiae Plantarum* 37:1727 DOI 10.1007/s11738-014-1727-1
10. Fatemeh Mahdavi-Darvari, **Normah Mohd Noor** & Ismanizan Ismail. 2015. Epigenetic regulation and gene markers as signals of early somatic embryogenesis. *Plant Cell Tissue and Organ Culture* 120:407–422 DOI10.1007/s11240-014-0615-0