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Virtosomes – Intracellular messengers?

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Virtosomes are cytosolic complexes formed from newly synthesized DNA, RNA, protein and lipid and have been demonstrated to be present in human and other mammalian, avian, amphibian and tumour cells. The phospholipid composition is different to that of the cell membrane being rich in sphingomyelin (SM) and phosphatidylinositol (PHI), but with lower phosphatidylcholine levels. Previous experiments have shown SM to stabilize chromatin, especially protecting RNA, whilst PHI is important for transport across membranes. Stimulated lymphocyte (SL) virtosomes differ from those from non-stimulated lymphocyte (NSL) in both molecular weight and protein content.

They are released from cells and have been demonstrated to enter other cells and their nuclei. Based upon studies of *in vivo* immune responses and *in vitro* studies on the switch on-and-off of DNA synthesis in non-dividing and dividing cell lines and tumour cell lines, it was proposed that virtosomes act as intra-cellular messengers. It also implies that synthesis of new proteins occurs in the recipient cells.

Our recent studies showing that virtosomes from SL populations initiate cell replication in NSL populations and those from NSL inhibit SL confirm this hypothesis. This could happen also during hepatocyte maturation in newborn rats when the synthesis of specific proteins reaches a high level in the absence of cell duplication, being due to the loss of and new synthesis of DNA so transforming a large number of cells. Metastasis may occur other than through cell migration, possibly through tumour cell virtosomes being transferred to other cells.

Biography

Degree in Medicine and Surgery, PhD Scuola Normale Superiore, professor of General Pathology at the Faculty of Medicine of Perugia University from 1975. Delegate of International affairs, President of TUCEP Consortium and actually of ONLUS Foundation for research "Enrico Puccinelli". Authors of more than 300 publication most on International Journal. Scientific fields of interest are: cell proliferation *in vivo* and *in vitro*; non premitotic DNA synthesis; tumor cell proliferation and oncogene expression; gene expression in hepatocytes during neonatal maturation and liver regeneration; presence of a phospholipidic fraction in hepatocyte chromatin and its metabolism presence of DNA in blood and in biological fluids.

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