

## Interstitium!!!! May be the New Road for Metastases of Many Cancers

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This article is about a well-known science but an unknown innovation in many ways. How? We have studied the anatomy and physiology of our body in books, which says “Interstitium” is a network of connective tissues made of cartilage and fibres found throughout the body, surrounding, connecting, protecting and holding the digestive system, respiratory system, blood vessels and other organs. It is the one which keeps the organs in place and forms connection between bone and muscles. Interestingly, researches have come up with new findings which emphasizes in calling interstitium an organ, and says in between these spread out cells was a series of fluid filled sacs connected by a strong and flexible tissue filled with functioning proteins (Jill Gregory). The presence of this unique fluid filled sacs differentiates it from a mere connective tissue and makes the scientists to call it an organ. Since it is fluid in nature it expands, contracts and changes size and acts as a shock absorber protecting tissues from tearing off when an organ or muscle moves, in this way it is also an independent organ [1].

Interstitium is supposed to be one of the largest organs in the human body which has been left unnoticed, until Dr. David Carr-Locke and Dr. Petros Benias Mount Sinai Beth Israel Medical Center, who reported after investigating a patient’s bile duct for signs of cancer, figured out cavities (interstitium) which were not known human anatomy and further confirmed with Dr. Neil D. Theise MD, pathologist of New York University. Not only in bile duct, they were also present around many other crucial internal organs [1].

Another breakthrough finding is the discovery of a new diagnostic tool, a special live in vivo imaging technique, Probe-based Confocal low power Laser Endomicroscopy (pCLE), after intravenous injection of a fluorescent dye fluorescein, which gives magnified view of living tissue revealing that the interstitium is seen as a fluid filled sac throughout the body, constituting nearly 11 litres of fluids of our body, the interstitial fluid, which usually by classical pathological examination of tissues employing drying and fixing techniques eventual damaged these fluid filled sacs, and under microscope, the interstitium looked as a solid mass same as any other connective tissues. The interstitial fluid is a kind of extracellular fluid that floods all the cells and delivers vital nutrients and other substances such as sugar, salt, fat, hormones, water, oxygen and removes waste as carbon dioxide between capillaries and tissues. The excess interstitial fluid finally drains into lymphatic system, and the lymph successively drains into a blood vessel.

The most interesting, highly significant and novel idea is that this interstitium may be an unidentified route that cancer cells travel into lymphatic system, and might also be the reason for most of the benign cancers to become metastatic and spread to all organs. Since cancers often spreads outside an organ and carried into the lymph nodes, it may also transverse into dense connective tissue. If this theoretical concept is well proved through strong research grounds then interstitium could be a diagnostic marker that can be analysed to discover, protect and prevent different types

of deadly early stage cancers. Not only in cancers, since fluid is a marker in identification of interstitium, if so any influence it has on the fluid balance in rest of the body may also be the sole reason for some of the manifestations such as edema in heart failure, kidney disease and other infectious diseases. Henceforth, interstitial fluid can be considered as a new reliable marker for testing various types of metastatic cancers, inflammatory conditions such as cholangitis, pancreatitis, inflammatory bowel diseases, scleroderma, edema, fibrosis and infections. Thus studying interstitium and interstitial fluid could help us in better understanding about the human body, diseases and especially metastasis of cancers. A prospective concept, a new road while redigging into history might help in medical advancements and save many lives.

### Bibliography

1. Petros C Benias., *et al.* "Structure and Distribution of an unrecognized Interstitium in Human Tissues". *Scientific Reports* 8.1 (2018): 4947.

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