

ANATOMICAL CONCEPT OF SROTAS SHARIR**Dr. Nitin Kumar*¹ and Dr. Vikash Bhatnagar²**¹MD Scholar, Dept. of *Sharir Rachana*, NIA, Jaipur.²Assistant professor, Dept. of *Sharir Rachana*, NIA, Jaipur.Article Received on
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Rachana, NIA, Jaipur.**ABSTRACT**

Srotas is described in classics as anatomical structure which transports the specific entities from one place to the other place through exudation, filtration and permeation. It is dynamic inner transport system of the body-mind spirit organization and exhibit specificity and selectivity. *Ayurveda* has emphasised the role of *Srotas* both in physiological and pathological state, therefore study of *Srotovigyana* is essential for understanding the basic systemic & functional Anatomy of the body, because they exist from molecular level to systemic level in human body. So, it provides information regarding the body at gross

and subtle level. These channels of circulation are working at micro as well as macro level in the body. So it is important to explain the *Srotas* at cellular (micro) and systemic (macro) level anatomically.

KEYWORDS: *Srotas*, transport system, cellular level, systemic level.**INTRODUCTION**

Srotas is an inner dynamic transport system of body. Which transport different substances throughout the body. *Srotas* maintains the normal physiology, and also involved in various pathology as well. *Srotas* is a multi-meaning term referring to a variety of structures, functions and concepts in different contexts. From extreme gross (Systemic or macro) to most subtle (cellular or micro) the term *Srotas* could consider to the whole body as a single complex *Srotas*, or each gross physiological system such as the gastrointestinal system as one *Srotas* or a single tubular structure like a nephron as a *Srotas* or further ahead each single Cell of the body could be designated as a *Srotas* or even structures beyond the subcellular structures and receptor networks are the components of *Srotas* system.

These channels of circulation are working at micro as well as macro level in the body. So anatomically we can explain the *Srotas* at cellular (micro) and systemic (macro) level.

SYSTEMIC ANATOMY OF *SROTAS*

The human body consist of several levels of structural organisation. According to classics these innumerable channels are classified in certain numbers like *Acharya Charak* has mentioned thirteen types^[1] and *Acharya Sushruta* mentioned eleven pairs of *Srotas*.^[2] This can be better understood in following way.

Life entity carrying channels (*Prana, Udak and Annavaha Srotas*)

Prana, Udak and *Anna* are the essential tripod for life. These three *Srotas* has external openings for intake of *Prana, Udak* and *Anna* and then transported every part of the body by channels called *Pranvaha, Udakvaha* and *Annavaha Srotas*.

Dhatuvaha Srotas (7)

Body is composed by several level of organisation. Each and every cell in the body has a specialized structure and functions hence they are differ from each other in this manner. As evolution of multicellular organism has been progressed various cells and tissues organised into tissues and organs. One group of cell takes up one particular work and undergoes the necessary change in structure. This group of cell which is modified into specialized structure due to special work has been defined in *Ayurveda* as *Dhatu*s (tissue). Classification of *Dhatu*s (tissues) described in *Ayurveda* is based on some rational observations. Their specific functions are described in body as *Prinana, Jivanam* etc.

Thus human body is composed by mainly these seven types of tissues. These *Dhatu*s can be categorised into *Sthai* and *Asthai Dhtuas*.^[3] *Sthai Dhatu*s are placed in different places in body and nourished by specific transport system called *Dhatuvaha Srotas*.^[4]

Malavaha Srotas (3)

Ayurveda views elimination of *Mala* as an important indicator of overall health. After the metabolic process (digestion by *Agni*) of body certain waste (*Mala*) products are formed. Channels through which these *Mala* eliminated from the body are called *Malavaha Srotas*. Mainly *Purishvaha, Mutravaha* and *Swedvaha Srotas* consider as *Malavaha Srotas*.

CELLULAR (MICRO) ANATOMY OF SROTAS

Concept of *Srotovigyan* at cellular level is very well described in classics. As modern medicine developed a separate branch called Biochemistry which mainly deals various interactions at molecular and cellular level, similar concept related to molecular and cellular level is explained by our *Acharyas*. *Sravan Karma*^[5] of *Srotas* is mainly related with the transportation at very subtle level.

Transportation at cellular level can be categorised into two processes

1. Transcapillary transportation- the nutrients which are basic need for the cellular metabolism are driven through capillary to extracellular compartment by Starling's concept (according to pressure gradient).
2. Transmembrane transport^[6] the nutrients or biomolecules are transported by extra cellular compartment to intra cellular compartment by several specific mechanisms which are listed below.

Process	Type	Mechanism	Example
Diffusion	Passive	Along their concentration gradient	Exchange of gases in lungs.
Osmosis	Passive	Solvent tend to pass through a semi permeable membrane from a less concentrated solution to high concentration.	Water reabsorption in DCT, PCT of nephron. Reabsorption of tissue fluid in venule end of the blood capillaries.
Sodium-potassium pump	Active	Na ⁺² and K ⁺ moves opposite direction by an integral protein of membrane	Nerve impulses travel by this mechanism.
Calcium pump	Active	Ca ⁺² moves through cell membrane by an integral protein of membrane.	In sarcoplasmic reticulum of muscle cells, it maintains ionic Ca ⁺² concentrations.
Potassium-hydrogen pump	Active	K ⁺ and H ⁺ moves through cell membrane by an integral protein of membrane.	It causes secretions of H ⁺ in gastric mucosa and renal tubules.
Uniport, Symport and Antiport	Active	Bound molecule changes the configuration of carrier protein and moves across the cell membrane.	Glucose transporter and calcium pump.
Endocytosis	Active	cell engulfs the extracellular substances	Iron and cholesterol into the cell.
Exocytosis	Active	Cell secretes the substances which are trapped within the vesicles.	Digestive enzyme and synaptic transmitters.

DISCUSSION

Srotas are the anatomical entities which basically deals with maintaining body's homeostasis by transportation of specific entities from one place to the other place through exudation, filtration and permeation. Two significant terms mentioned in classics regarding functions of *Srotas* i.e. *Vahan Karma* and *Sravan Karma*. The *Vahan karma* is basically regarding transportation at Macro or systemic level and *Sravan Karma* is regarding at micro or cellular level. These *Srotas* are also very specific and selective to each of the substance which they carry. (As *Prana*, *Udak* etc.) Therefore this description illuminates the fact that concept transportation of various substances at Macro and Micro level is well known in *Ayurveda*.

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