It is necessary to think of models and mechanisms when we are carrying out research in holistic areas wherein these two are not fully developed. We need to know what a model is and what mechanisms are. American Heritage Dictionary defines a model as follows: “A schematic description of a system, theory, or phenomenon that accounts for its known or inferred properties and may be used for further study of its characteristics”. Thus, in science we use many models for understanding the overall characteristics of a system. For example, we have a model of an atom. This means we think of an atom as consisting of a central nucleus and a set of electrons orbiting around the nucleus in much the same way as planets revolve around the sun. Is this a good model? Yes, as this model has been used to understand the interaction between atoms and molecules of many substances. Has anyone seen an electron running around an atom at breakneck speed? No, but the model works! If science concludes that the model does not work under some conditions, then the model must be expanded or changed. The model of light as a particle did not explain the pattern of interference seen in one experiment. Hence, a wave model of light was introduced that could explain the new observation. Both the new and the old models could be used as each explains certain properties of light propagation! Thus a model is only a rough approximation of the observation of nature and it gives us a working hypothesis of what we are studying.

In Yoga, a typical representation of the human system is provided by the five layer model –panchakosa model – of the humans.[8] These are annamayakosa (covering made of food, namely the physical body); pranamayakosa (prana sheath, body-mind nexus); manomayakosa (mind sheath); vijnanamayakosa (intellect sheath); and finally, anadamayakosa (the bliss sheath). Have the five layers been measured? We know something about the body and the mind, but the rest is still an enigma. The most interesting is the body-mind nexus; but more about this at a later date.

Now, what is a mechanism? The dictionary provides the following: It is basically the arrangement of linked parts which makes a machine work. In philosophy, it is the doctrine that all natural phenomena are explainable through mechanical principles alone; it does not need a principle such as the spirit, or atma for its activity. There has been controversy in modern science for many centuries regarding the mechanism of life itself. Two major views that have dominated the debate are the Mechanist and the Vitalist views. The mechanist would say life is only a mechanistic process and if we probe deep enough, we can find all parts of the body working together which could be ‘fixed’ through mechanical and biochemical means. The Vitalist would say that there is a subtle principle – call it atma, prana or by any name – that is the driving force in systems that possess the quality of life. These views alternate in popularity as modern science and contemporary philosophy go through search and extension.

Let us look into popular – and unquestioned – mechanism in the biochemical paradigm of modern medicine. The brilliant scientist and Nobel Laureate, Dr. Albert Szent-Gyorgyi proposes four dimensions that a biologist should be concerned with. These are macroscopic, microscopic, molecular and sub-molecular or electronic. In his view, the first three areas have come into focus of biologists while the fourth, namely, the electronic has been totally forgotten.[9] In the electronic model, he proposes that “The living state is the electronically desaturated state of protein” [3, p. 17]. At the other end of the spectrum, he says “Taking out electrons irreversibly means killing”. These are very powerful statements giving a fundamental role to electron transport mechanisms in biological systems. However, unfortunately, the mechanism and activity of electrons in human at the most fundamental level is not available. Hence when scientists discuss the mechanism of a drug activity, they are at the level of molecular and not at the most fundamental, namely, the electronic level. Thus, the biomedical model of the body which is the dominant paradigm presently should understand electronic transport in molecules to present itself with a complete mechanism. It seems this deficiency is not going to be resolved in any foreseeable future. Thus presently from Dr. Szent-Gyorgyi’s point of view, the biochemical model is an incomplete one.

As for as we are considered, a mechanism is a pathway; it is a channel through which any procedure (biochemical or holistic) works. For example, we know how stress causes changes in blood pressure through expression of specific biochemicals. It is an important aspect of research to determine the mechanism or the pathway through which the system (in our case, the body-mind complex) reacts to a procedure. In our research, the question arises why
we should recommend practice of yoga modules to a particular condition. For example, a person comes with complaint of low back pain. Now back pain could be due to many reasons; for example, improper posture, work-related injury, tuberculosis, or many others. We need a model to start with, so that we could treat the condition; after treatment we need to postulate a mechanism based on our observation and measurements!

The above example is a simple one; we test the low back for flexion/extension and if there is no specific problem mentioned above, it could be due to posture or a repetitive injury. We need to build the muscles that support the low back through application of the principles of yoga biomechanics. Simple exercises combined with relaxation of body and mind could bring back normal activity and could reduce pain in the affected part. There are, of course, more complicated scenarios that we meet in the clinic every day. Depression and anxiety are conditions which affect large number of people around the world. Is yoga useful in such cases? An interesting and important study looked into the changes in GABA (γ-aminobutyric acid) in people who were practicing yoga for 12 weeks. Thalamic GABA levels were elevated in Yoga practitioners as seen in MRI scans along with improved mood and decreased depression.[4] Normally GABA levels are reduced in patients with depression and related disorders and pharmacological agents are administered to increase the GABA levels. If yoga could increase GABA in practitioners, then there is a huge scope to provide yoga learning procedures for depression. Here we have a classical case of a good model followed by an excellent experimentation providing a detailed mechanism for the use of yoga in depression and related problems. Unless we have such detailed mechanism worked out, it is not possible to convince main stream researchers regarding the use of any complimentary method in clinics. Looking for other applications of yoga, is there a need to teach components of yoga to cancer patients? The patients could complain of a host of symptoms: pain, fear, stress due to a sudden verdict of terminal disease, depression, denial and not the least, body reaction to intense chemotherapy and radiation. In this complex state of affairs, a broad based therapy such as asana, pranayama with emotional and spiritual support is very important. In our model, we cater to the needs of all the five kosas, annamaya, pranamaya, manomaya, vijnanamaya and aanandamaya. While some holistic therapies may address some of the above kosas, yoga seems to provide a broad based support for all the above. The model, as mentioned earlier, is simply a working hypothesis now; it seems to be a useful one. To promote this model into a mechanism, we need a host of research and instruments (some not even available) and this is going to take a while. Meanwhile, we should apply the model and look for unique results that could come out of teaching yoga modules to diverse patients.

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