



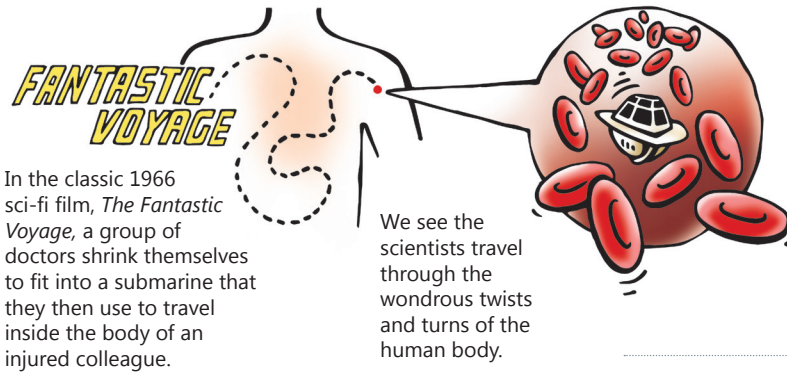
V. Kumaran

Professor, Department of Chemical Engineering, Indian Institute of Science (IISc), Bangalore

- B. Tech. in Chemical Engineering from Indian Institute of Technology, Madras
- Ph.D. in Chemical Engineering from Cornell University, USA

Prof. Viswanathan Kumaran has pioneered the study of transition and turbulence in the flow through soft-walled tubes and channels, an area of immense importance in the fields of cardio-vascular and pulmonary flows, as well as for lab-on-a-chip technologies.

“Failure and success are inevitable. Failure in research basically means that we thought we understood something but actually it didn’t turn out to be the way we thought it was. And when that happens, of course we have to go back and look step by step at all of the assumptions – go back to the basics and work back up again.”



In the classic 1966 sci-fi film, *The Fantastic Voyage*, a group of doctors shrink themselves to fit into a submarine that they then use to travel inside the body of an injured colleague.

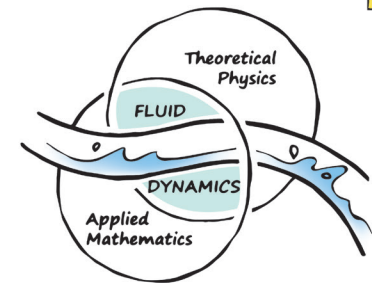
We see the scientists travel through the wondrous twists and turns of the human body.



Although we may not be at a stage where such voyages are possible, we have seen enough advances to make it all seem magical. These include portable diagnostic tools that use lab-on-a-chip (LOC) technology.



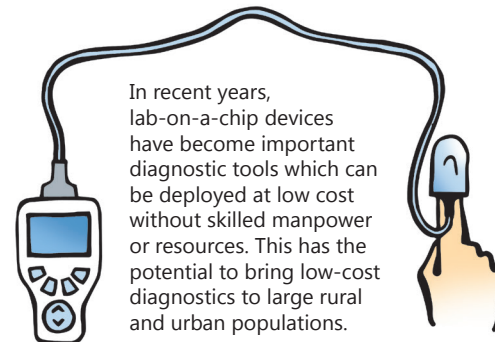
This becomes important in bringing affordable diagnostics to low resource environments such as rural healthcare.



Prof. Kumaran works in the field of fluid dynamics. He uses a combination of theoretical physics and applied mathematics to determine how fluids flow through soft-walled tubes.



Examples include urine testing strips; and pulse-oxymetry machine that check oxygen levels in the blood.



In recent years, lab-on-a-chip devices have become important diagnostic tools which can be deployed at low cost without skilled manpower or resources. This has the potential to bring low-cost diagnostics to large rural and urban populations.



The results of his work become particularly important in cardio-vascular and pulmonary medicine.

