Marcos Intaglietta, Ph.D.

FOUNDER ♦ UC San Diego Bioengineering

Professor Intaglietta earned his Ph.D. in Applied Mechanics from CalTech in 1963 and used its rigorous principles in bringing forth engineering concepts, including Transport Phenomena and Digital Signal Processing, to the Bioengineering field.

Dr. Marcos Intaglietta conceived and co-founded the first Biomedical Engineering academic program in the nation at UC San Diego in 1965, and in 1966 became a founding bioengineering faculty member. He is the internationally recognized authority in bioengineering tools applied to microvascular analysis and development of transfusions for blood loss. His over 500 scientific publications and books are the foundations to measurements of the physics of capillary blood flow and transport in numerous diseases. He established early collaborations between Clinicians and Engineers. Professor Marcos Intaglietta is the longest serving member of the UC San Diego Bioengineering faculty and retired in 2020.

He pioneered technology and methods to study the microcirculation in cancer and presented the first measurements of capillary flow in man with high precision. He discovered the extraordinary role of blood viscosity in maintaining microcirculatory function, showing that a critical benefit from blood transfusion is the restoration of blood viscosity and not necessarily oxygen-carrying capacity. This led to his invention of "supra-plasma expanders" that reverse engineer the purpose of transfusion, rendering the microcirculation more effective in transporting oxygen, rather than restoring oxygen-carrying capacity using blood transfusions. This approach significantly reduces the need for transfusing 1-2 units of blood, which uses 1/3 of the available world blood supply.

Dr. Intaglietta demonstrated unequivocal excellence in using engineering concepts to design instrumentation for measuring many aspects of fluid flow in physiologic systems. It is widely recognized that most instruments in his laboratory are his brainchildren developed with elegant and opportune engineering approaches. Many of these instrumentation platforms have been adopted for basic and applied clinical research, with intra-vital imaging, a technique routinely used worldwide to image microcirculation in living tissue, as an example.