

Biomaterials and biotechnology: From the discovery of the first angiogenesis inhibitors to the development of controlled drug delivery systems and the foundation of tissue engineering

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Advanced drug delivery systems are having an enormous impact on human health. We start by discussing our early research on developing the first controlled release systems for macromolecules and the isolation of angiogenesis inhibitors and how these led to numerous new therapies. For example, new drug delivery technologies including nanoparticles and nanotechnology are now being studied for use treating cancer and other illnesses. We then discuss ways of developing novel microchips for drug delivery. Approaches for creating new biomaterials are then evaluated and examples where such materials are used in brain cancer and shape memory applications are discussed. Finally, by combining mammalian cells, including stem cells, with synthetic polymers, new approaches for engineering tissues are being developed that may someday help in various disease. Examples in the areas of cartilage, skin, blood vessels and spinal cord repair are discussed.