

The Chemicals Reactions and its Behavior against Related Bioinorganic Materials

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Abstract

Bioinorganic mixes or materials assume the earth shattering job in every single living life form. Fake organs are commonly characterized as any gadget, machine or complex organic structure which is mostly or totally manufactured in nature and that could be embedded or coordinated into human body to play out the errands of a specific organic structure which has been harmed and ought to be supplanted because of some clinical reasons. Different fake organs like bone, heart, kidney, liver, lung, pancreas, skin, urinary bladder, sound-related brainstem embed, bionic contact focal point, cochlear embed, direct acoustic cochlear embed, retinal embed and visual prosthetic parts have been created. In this paper we are neglecting about counterfeit biomaterial and organs.

Keywords: Chemicals resources, artificial heart, skin, sensor etc.

I. INTRODUCTION

Overwhelmingly these mixes are answerable for the essential exercises of a creature, for example, enzymatic activities, breath, photosynthesis, metal particle transport and so forth. In ongoing time various bioinorganic materials have been incorporated in part or totally in the research facilities. These manufactured bioinorganic materials fill in as clinical shelter for humanity as they are the key for improvement of fake tissues and organs.

II. ARTIFICIAL ORGANS

Artificial Heart:- it is basically a device which provides circulatory support to the patients, those who are waiting for donor hearts or those who need temporary support while their damaged hearts recover. Jarvik-7 was the first successfully implanted artificial heart in human. Ventricular assist device and cardiopulmonary bypass machine are also implanted in human

bodies to support the failing heart. POLVAD, Phoenix-7, Abiomed AbioCor, SynCardia, MagScrew, Abiomed AbioCor II, Carmat bioprosthetic heart, Frazier-Cohn are the different prototypes of the artificial heart. These devices are generally made up of metal alloys, flexible silicones, chemically treated animal tissues, bio materials, electronic sensors etc.

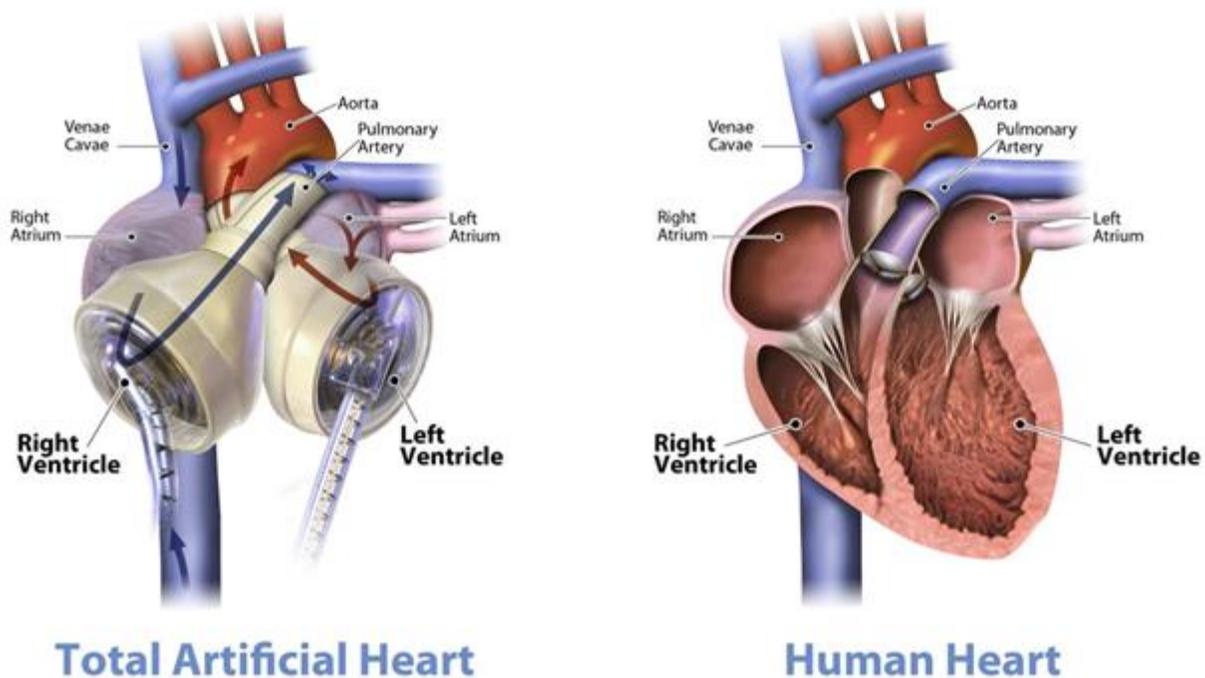


Fig 1: Artificial heart

Artificial Skin:- It is a temporary or permanent replacement of damaged skin. Initially auto skin grafts and all skin grafts were used for the development of artificial skin but later on spray on skin (culturing of healthy skin and keratinocytes and spraying on to small tissues), temporary skin grafts (culture of unwounded epidermal layer as large sheets), permanent skin grafts (extraction of skin and fibroblasts from the other parts of body and culture on mesh scaffolding), artificial electronic skin (semiconductor nanowires), gelatin containing artificial skin (gelatin isolated from collagen with salt leaching method) composite biocompatible epidermal skin grafts (culture of keratinocytes with silicone membrane i.e. Integra) techniques were developed. Recently nano technology (carbon nanotubes), embryonic stem cells, self-healing polymers etc are being used for the generation of artificial skin.

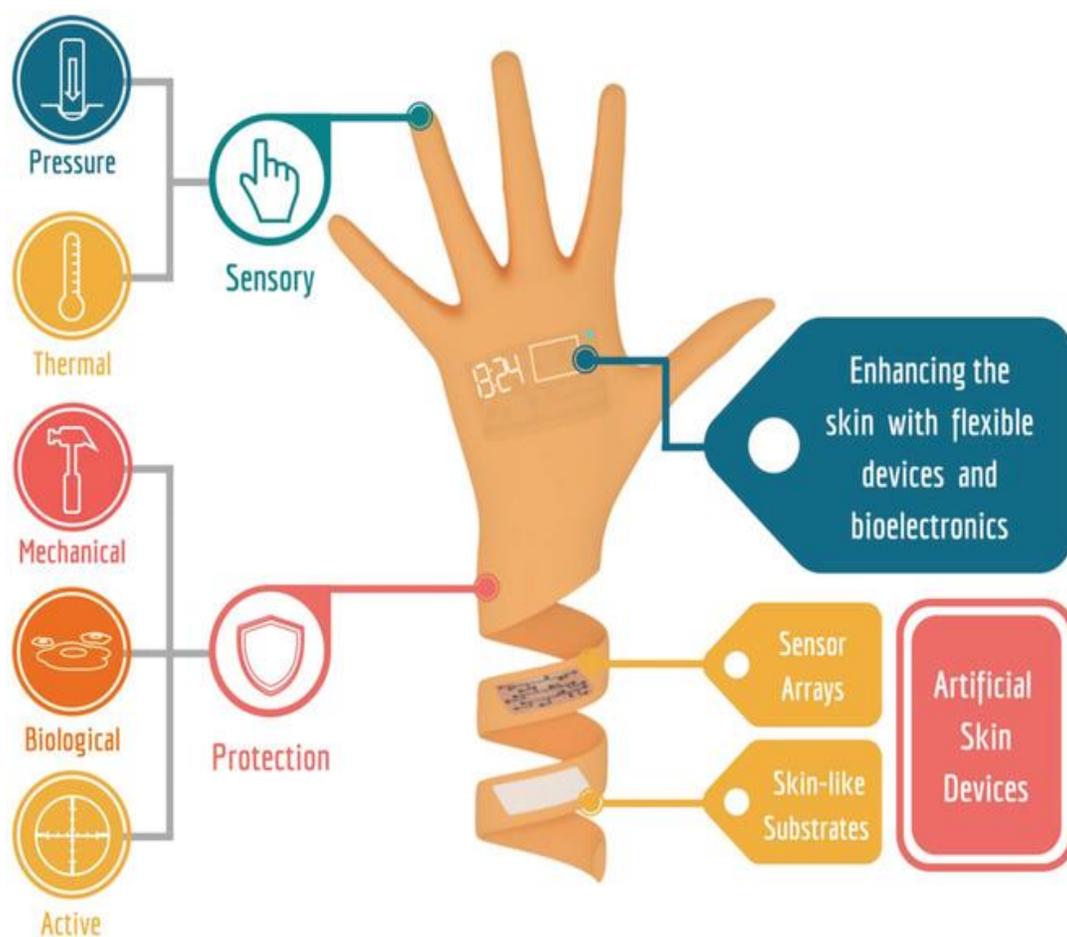


Fig 2: Artificial Skin

Artificial Pancreas:- It is particularly useful for diabetes patients. It automatically controls the blood glucose level and provides substitute endocrine functionality. Generally bio-artificial pancreas consists of a biocompatible sheet of encapsulated beta cells. Gene therapy is also being used for the development of artificial pancreas. An insulin pump under closed loop control is another approach of artificial pancreas.

Artificial Lungs:- It is a device which maintains appropriate blood pressure, decreases injuries of blood cells and minimizes clotting and immunologic response. Extracorporeal membrane oxygenation (ECMO), intravascular oxygenator (IVOX), high-flow cannula in the femoral artery and vein which behaves as pumpless shunt, extracorporeal CO₂ removal etc are some devices which are related to artificial lungs.

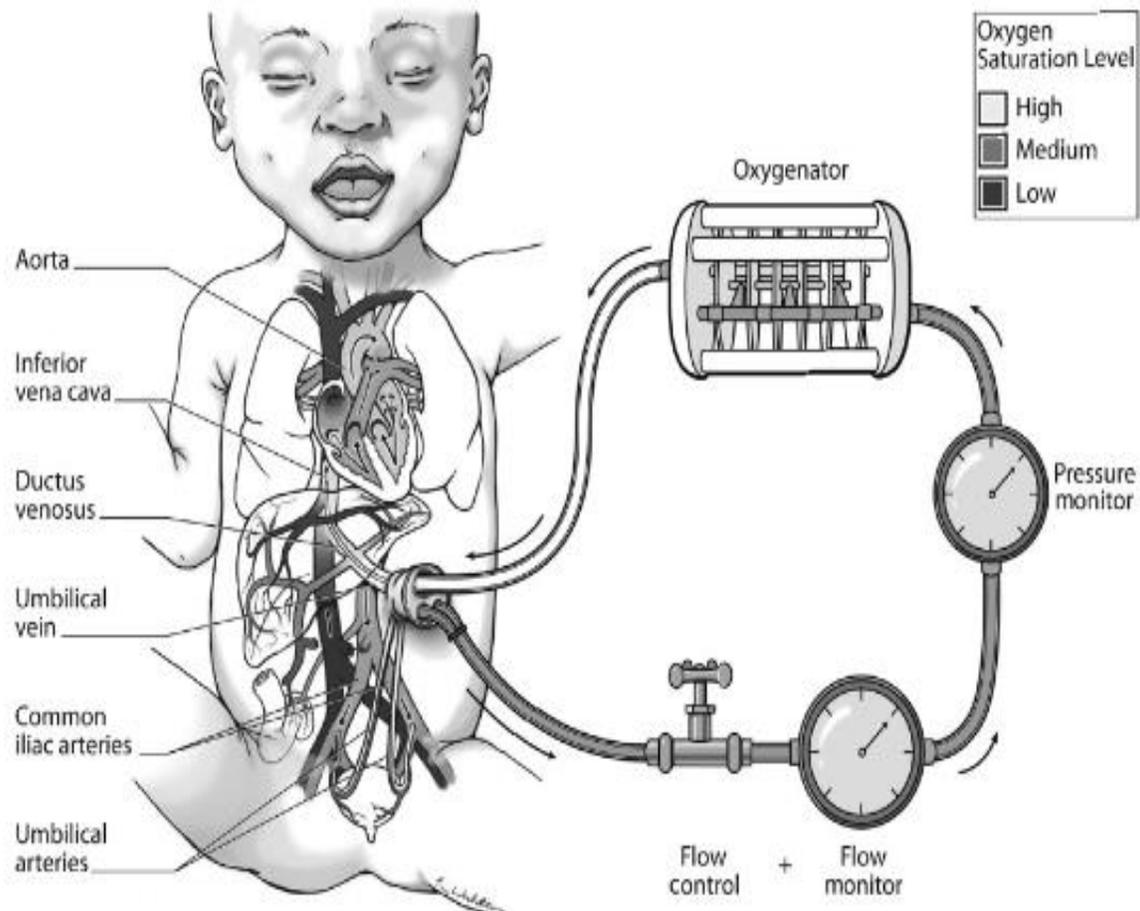
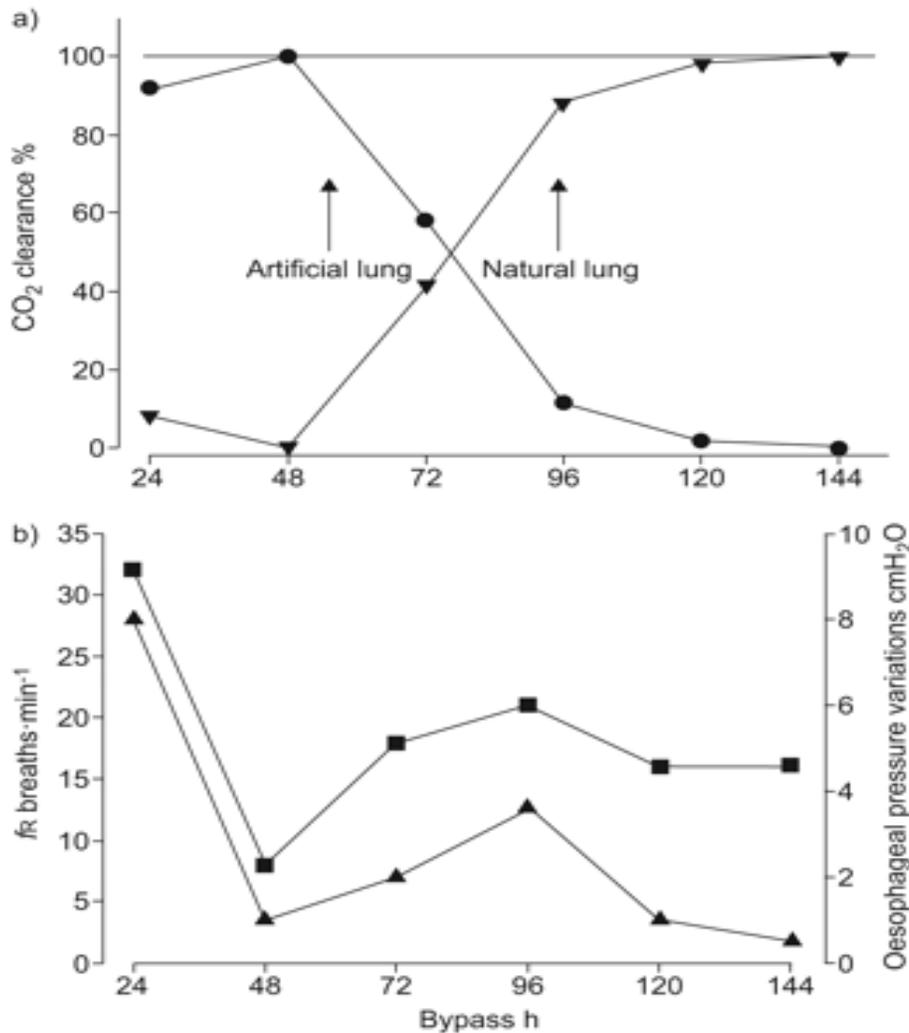


Fig 3: Artificial Lungs

Artificial Urinary bladder:- There are two primary methods for the replacement of urinary bladder. First is the redirection of urine flow and second is *in-situ* replacement of bladder. Illegal conduit urinary diversion, Indiana pouch reservoir and neobladder to urethra diversion are three prime surgeries for the redirection of urine flow. In these procedures a small part of small and or large intestine is separated from fecal stream and used for the reconstruction of urinary bladder. In alternative approach culture of urothelial and muscle cells is seeded on a biodegradable bladder-shaped scaffold which is made of collagen or a composite of collagen and polyglycolic acid. Similarly other artificial organs like auditory brainstem implant, bionic contact lens, cochlear implant, direct acoustic cochlear implant, retinal implant, visual prosthesis and other assisted devices are developed which possibly help the patients to return in normal life. Although a lot of research is being conducted in this direction but still there is a need of highly advance and specific technologies that could make this field more approachable to normal human being.



III. CONCLUSION

The combination of counterfeit bio materials is an interdisciplinary field which interfaces biotechnology, material science and nanotechnology. Different procedures like biomineralization, blend and advancement of bio-propelled materials and biomimetic frameworks are patrilineal to the manufactured counterfeit bio materials. The ongoing improvements of novel bio nanocomposites with multi-functionalities lead us to the cutting edge in this field. Counterfeit bio materials are essentially significant in the advancement of fake organs.

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