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# Biomaterials Made of Biodegradable Polymers

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## Abstract

**For the production of bioenergy and biomaterials, biomass represents a plentiful, carbon-neutral renewable resource, and its increased utilisation would meet a number of social demands. The bio refinery, a revolutionary manufacturing idea for transforming renewable biomass into useful fuels and products, is the result of advancements in genetics, biotechnology, process chemistry, and engineering. The production of sustainable biomaterials and bio power that will usher in a new manufacturing paradigm is possible with the integration of agro energy crops and bio refinery manufacturing technologies.**

**Over the past 20 years, tremendous progress has been achieved in the creation of biodegradable polymeric materials for use in the biomedical field. For the creation of therapeutic devices including temporary prostheses, three-dimensional porous scaffolds for tissue engineering, and controlled/sustained release drug delivery vehicles, degradable polymeric biomaterials are the ideal options. To deliver effective therapy, each of these applications requires materials with certain physical, chemical, biological, biomechanical, and degrading qualities. As a result, a wide variety of organic or synthetic polymers that can degrade via an enzymatic or hydrolytic process are being researched for use in biomedical applications.**

***Keywords:* Biodegradable; Polymers; Biomaterials; Hydrolytic degradation; Enzymatic degradation**

## Introduction

Since ancient times, zircon has been regarded as a gem. Zirconium is a metal with an Arabic name of Zargon (golden colour), which itself is derived from the Persian terms Zar (Gold) and Gun (Colour). Zirconia, also known as metal dioxide ($ZrO_2$), was first discovered in 1789 by German chemist Martin Heinrich Klaproth in the reaction product that resulted from burning some stones. Zirconia has long been used as a ceramic pigment combined with rare earth oxides.

Biodegradable (hydrolytically and enzymatically degradable) biomaterials for medical and related purposes have replaced bio stable biomaterials in the latter two decades of the twentieth century. According to the current trend, biodegradable devices that could aid the body in repairing and regenerating the injured tissues would replace many of the permanent prosthetic devices currently utilised for short term therapeutic purposes. The preference for biodegradable materials over bio stable ones in biomedical applications can be attributed to a number of factors. The primary motivating factors are the long term biocompatibility problems with many of the permanent implants now in use, as well as the numerous ethical and practical problems with revision surgeries.

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## Description

In the final two decades of the 20th century, biodegradable (hydrolytically and enzymatically degradable) biomaterials for medical and related purposes began to replace bio stable biomaterials. According to the present trend, biodegradable devices that might aid the body in repairing and regenerating the injured tissues are expected to replace many permanent prosthetic devices used for short-term therapeutic purposes in the next years. There are a number of factors that favour biodegradable materials over bio stable ones in biomedical applications. Long term biocompatibility problems with many of the permanent implants currently in use, as well as a wide range of ethical and practical problems related to revision surgeries, are the main motivating factors.

## Conclusion

The majority of the biodegradable products available today are made of natural polymers like collagen and synthetic polymers like poly (esters). A variety of innovative polymeric materials are being developed as potential options for transitory implants and drug delivery systems thanks to advancements in synthetic organic chemistry and novel bioprocesses. The capacity to custom develop or modify existing biomaterials to achieve suitable biocompatibility, degradation, and physical qualities to elicit positive biological responses is key to the success of biodegradable implants.