

# **Biotechnologies towards Sustainable Development in Malaysia**

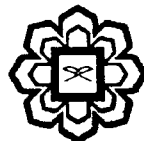
**Zarina Zainuddin**

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# **Biotechnologies towards Sustainable Development in Malaysia**

*Zarina Zainuddin*



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## Chapter 21

### Chitin and chitosan from fresh water fish tilapia (*Oreochromis niloticus*) scale

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#### Introduction

Chitin is the second most abundant natural polymer in nature after cellulose, which consists of 2-acetamido 2-deoxy- $\beta$ -D-glucose through a  $\beta$  (1  $\rightarrow$ 4) linkage. Chitin is unusual because it is a "natural polymer," or a combination of elements that exists naturally on earth. Usually, polymers are man-made. As a point different from other abundant polysaccharides, chitin contains nitrogen in addition to carbon, hydrogen and oxygen. It is sometimes considered to be a byproduct of cellulose, because the two are very molecularly similar. Cellulose contains a hydroxyl group and chitin contains acetamide. Like cellulose, it functions as structural polysaccharides. Chitin and chitosan are only slightly different on a molecular level. Chitosan contains an amine group, or a group without carbons bonded to oxygen, whereas chitin contains an amide group, where this is the case. Chemically, chitin is known as poly-*N*-acetylglucosamine and in accordance to its proposed name, the difference between chitin and chitosan is that the degree of deacetylation in chitin is very little compared to chitosan (Muzzarelli, 1973).