

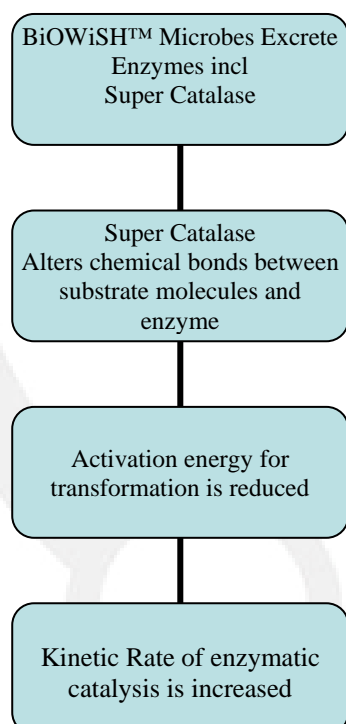
Technology Overview

BiOWiSH™ is a revolutionary biotechnology that harnesses natural microbial and enzyme functionality with a proprietary protein 'Super Catalase' that provides a significant biochemical rate acceleration. The mode of action is to increase in the kinetic rate of enzymes through a reduction in activation energy requirements.

The action of Super Catalase is perhaps best visualized as a 'universal co-enzyme' due to its ability to accelerate the rate of catalysis. Super Catalase is however a whole functional enzyme.

Super Catalase has the effect of altering the chemical bonds of substrates in enzymatic reactions, This allows BiOWiSH™ to reduce activation energy for catalysis that in turn produces dramatic improvements in the kinetic rate of enzymes produced by the BiOWiSH™ microbial culture. This sequence is shown diagrammatically in Figure 1 below.

Figure 1.



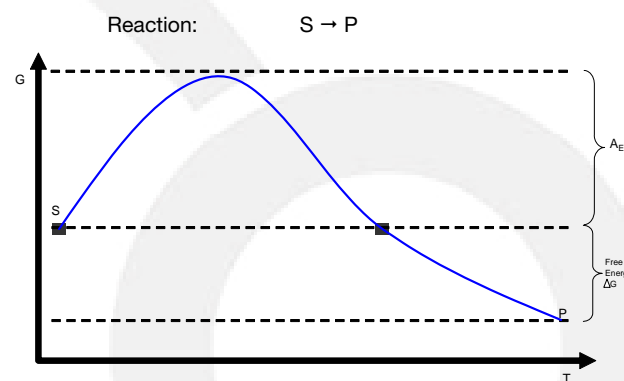
Due to this unique capability, BiOWiSH™ is a powerful core technology that accelerates natural biochemical enzymatic reactions thousands to hundreds of thousands times their normal rate.

How Does BiOWiSH™ Work?

To explain the operation of BiOWiSH™ it is helpful to first understand the role of enzymes in accelerating catabolic transformations of molecules.

For any biological macromolecule there is the potential to transform the molecule into its simpler pre-cursors and transform chemical energy. Such a reaction can be shown in the following diagram (Figure 2) where S = Substrate, P = Product and A_E = Activation Energy and ΔG = Free Energy.

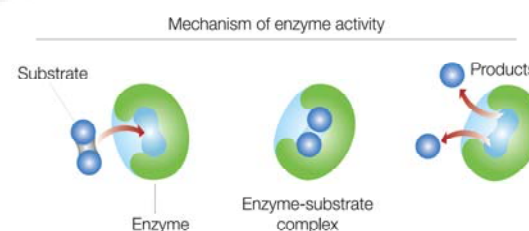
Figure 2.

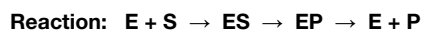


Activation Energy (A_E) is the energy required to trigger a biochemical transformation of the substrate (S) into the product (P) at given ambient conditions. This energy hill is the rate limiting factor for the transformation. Free Energy (ΔG) is the energy released through the transformation.

An enzyme is a catalyst that can accelerate transformation of molecules at up to 10^{17} times faster than they would otherwise occur.

A simple enzymatic reaction can be shown as follows: Figure 3.





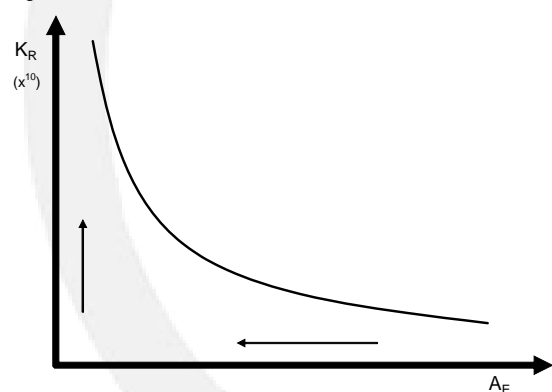
Note: For a more detailed overview of Enzyme activity and the enzyme / microbe relationship please see the BiOWiSH™ Enzyme Fact Sheet at:
<http://www.biowishtechnologies.com/downloads/BiOWiSHEnzymes-FactSheet.pdf>

Enzymes achieve their catalytic potential by reducing the Activation Energy which in turn increases the rate of transformation.

There is a direct inverse and exponential relationship between activation energy required to complete an enzymatic transformation and the kinetic rate or rate of reaction of any enzyme. This relationship is shown in the figure below.

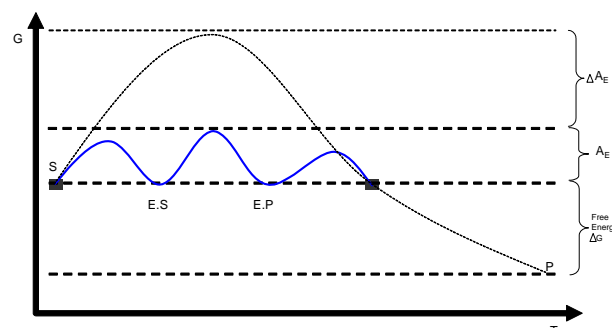
As shown in Figure 4, a small reduction in the Activation Energy (A_E) produces a large increase in rate of catalysis or the Kinetic Rate of the enzyme (K_R).

Figure 4.

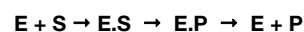


In our reaction shown above in Figure 2 the presence of an enzyme specific to this transformation has the effect shown in Figure 5 below:

Figure 5.



The reaction for this transformation is as shown in Figure 3:



In this reaction the change in activation energy (ΔA_E) shows the reduction in energy required to perform the transformation. As indicated in Figure 4 this reduction in activation energy corresponds to an exponential increase in the rate of transformation. This rate increase provided by the enzyme is known as its Kinetic Rate (K_R).

BiOWiSH™ contains a newly discovered protein, Super Catalase which has the potential to increase the Kinetic Rate potential of any enzyme that is produced by the BiOWiSH™ microbial culture. This is why Super Catalase can be thought of as a universal Co-Enzyme in that it further accelerates the rate of catalysis that other enzymes are able to perform. Where an enzyme reaction is typically enhanced by a co-factor or a co-enzyme, Super Catalase will further enhance the reaction rate in the presence or absence of the particular mineral or vitamin to the reaction.

Super Catalase bonds with the substrate at a receptor site to form a reaction intermediate (SC.S). The chemical bond that occurs is known as Binding Energy and at this point a small amount of additional energy is released that is available to reduce activation energy when the next intermediate compound (E.SC.S) is transformed (into P.SC.S). It is through this additional release of energy with each transformation that Super Catalase reduces activation energy and thereby increases the kinetic rate of enzymes.

Figure 6 below shows a transformation in the presence of Super Catalase (SC) where the reaction becomes:

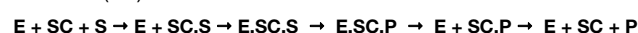
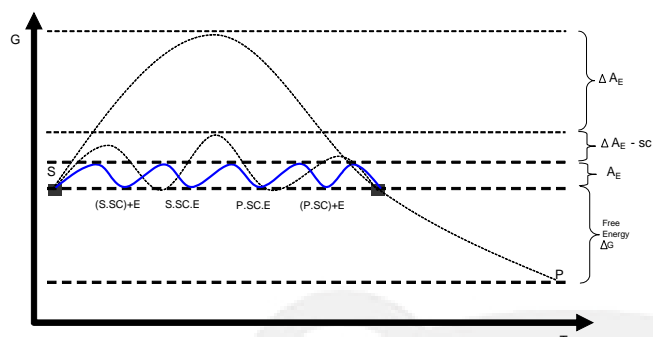


Figure 6.

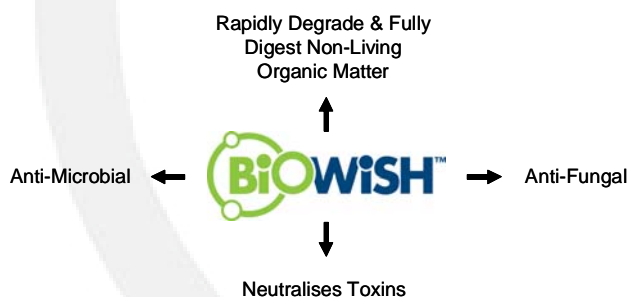


The additional reduction in activation energy provided by Super Catalase is shown as $\Delta A_E - SC$.

The result of this is a significant increase in catalytic rate potential and an ability to catalyze reactions in a wider range of environmental conditions than would normally be possible.

BiOWiSH™ posses 4 core capabilities that are deployed across its many applications.

BiOWiSH™ Core Capabilities



Degrade & Digest Organic Matter

BiOWiSH™ rapidly degrades the molecular structure of any organic matter into simpler structures through its accelerated catabolic enzymatic activity. It then rapidly digests the full spectrum of organic matter into final inert end products via microbial digestion.

Anti-Microbial

BiOWiSH™ cultures produce a powerful anti-microbial agent known as a Pediocin (or Bacteriocin). The pediocins produced by BiOWiSH™ are effective on the full range of gram negative and a wide range of pathogenic gram positive bacterium. The mode of action is unlikely to build specific resistance and is via membrane

destabilization and autolytic action or cytoplasmic leakage leading to cell lysis.

Anti-Fungal

BiOWiSH™ produces a peptide compound known as an Iturin which is a powerful anti-fungal agent. Iturins are also known to eliminate Aflatoxins. This capability is deployed in cropping, water treatment and human health applications of BiOWiSH™.

Toxin Neutralisation

BiOWiSH™ contains Killer Toxins which provide an ability to neutralize a wide range of toxins. This capability is deployed in animal health, environmental and human health products.

BiOWiSH™ Composition

BiOWiSH™ is a revolutionary microbial technology consisting of three beneficial bacteria and two yeasts acting in symbiosis creating a wide complement of enzymes including the proprietary Super Catalase.

BiOWiSH™ is formulated from 11 pure strain active ingredients which are stored within certified biological warehouses in the USA. These are then cultured and fermented in a multi-stage process with a specially developed combination of bio-vitamins and bio-minerals that are then further processed into the 3 forms of BiOWiSH powder ready for packaging or inclusion in other products.

Six of these active ingredients disappear in the production process and the remaining five pure beneficial microbes remain in our products for environmental or animal health use.

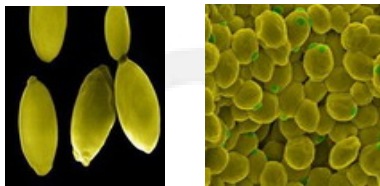
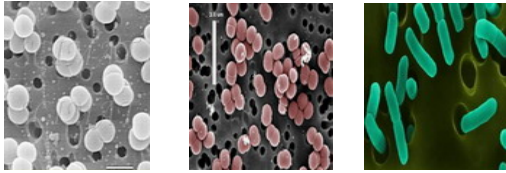
For human health & cosmetic applications further process sterilize BiOWiSH™ retaining only the pure BiOWiSH™ enzymes and metabolites.

The five remaining microbes include:

- *Pediococcus pentosaceus* Mees (**bacteria**)
- *Bacillus subtilis* (**bacteria**)
- *Pediococcus acidilactici* (**bacteria**)
- *Dekkera anomala* (**Yeast**)
- *Pichia farinose* (**Yeast**)

BiOWiSH™

The world's most powerful Enzyme technology



3. Broad Spectrum

BiOWiSH™ is formulated to create a very diverse group of catabolic hydrolysing enzymes. This provides an ability to rapidly and fully digest all non-living matter that is organic in origin.

4. Broad Operative Range

BiOWiSH™ due to its kinetic rate enhancement technology is able to operate in a much broader range of environmental conditions than previously available technologies.

For further information please visit www.biowishtechnologies.com

Forms of BiOWiSH™

BiOWiSH™ is available in 3 different forms from which are formulated into the range of BiOWiSH™ products:

- 1. BiOWiSH™ Powder**
The active microbial formulations used in environmental management, cleaning and animal health.
- 2. BiOWiSH™ Food Grade**
A formulation that is further fermented to contain a high level of enzymes, Super Catalase and metabolites but no active microbials.
- 3. BiOWiSH™ Cosmetic Grade**
BiOWiSH Food Grade with a protective cellulose coating that allows the product to be stored in solution with mechanical activation.

What Makes BiOWiSH™ so unique?

BiOWiSH's superior performance across its many applications can be summarised as follows:

- 1. Very High Speed**
'Super Catalase' the proprietary enzyme in BiOWiSH™ makes products formulated with our technology thousands of times faster than what was previously possible.
- 2. Broad Functionality**
BiOWiSH™'s 4 core capabilities of rapidly breaking down organic waste, anti-microbial, anti-fungal and toxin neutralisation, with the speed enhancement makes BiOWiSH™ a truly unique technology.

BiOWiSH™

The world's most powerful Enzyme technology



Biological help for the Human Race



BiOWiSH Technologies Pty Limited
Website: www.biowishtechnologies.com

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