



ISOENZYMES RIBOZYME ABOZYME

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MSC BIOCHEMISTRY II SEM 2020

DEFINITION OF ISOENZYMES

- *Multiple forms of the same protein that catalyze the same reaction but differ from each other in their amino acid sequences, substrate affinity, V_{max} and/or regulatory properties; also called isozyme.*
- *Lactic dehydrogenases, LDH,*
- *For example, is an enzyme which exists in 5 possible forms in various organs of most vertebrates. LDH catalyzes the reversible oxidation–reduction reaction:*



ISOENZYMES OR ISOZYMES

- Isoenzymes have two or more polypeptides.
- Expressed in different tissues.
- Isoenzymes can be incoded by single genes or different genes.

THEY DIFFER WITH RESPECT TO:

- *Isoenzymes or isozymes are multiple forms of same enzymes that catalyses the same chemical reactions.*
- *Amino acid composition*
- *Amino sequence*
- *Electrophoretic mobility*
- *Kinetic Properties*

RIBOZYMES

WHAT ARE RIBOZYME ?

- A **Ribozyme** (*ribonucleic acid enzyme*) is an RNA molecule that is capable of performing specific biochemical reactions , similar to the action of protien enzymes.

CHARACTERSTIC FEATURE OF RNA MOLECULE ARE :

- *An enzyme that uses RNA as a substrate*
- *An RNA with enzymatic activity*
- *An enzyme that catalyses that assosiation between the largre and small ribosomal subunits*
- *Anenzyme that synthesise RNA as part of transcription process*
- *An enzyme that synthesise RNA primer during DNA replication as part o*

TYPES OF RIBOZYME

- *Groups I and group II Intron splicing ribozymes*
- *RNas P*
- *Hammerhead Ribozyme*
- *Hairpin Ribizyme*
- *Ribosome*

GROUP I INTRON SPLICING

- *Group I Intron ribozymes constitute one of the main classes of ribozyme.*
- *Found in bacteria , lower eukaryotes and higher plants .*
- *Group I introns are also found inserted into genes of a wide variety of bacteriophages of Gram- positive bacteria .*
- *However , their distribution in the phage of Gram – negative bacteria is mainly limited to the T4 , T- even and T 7 – like like bacteriophages .*

GROUP II INTRON SPLICING

- *Group II introns have been found in bacteria and in the mitochondrial and chloroplast genomes ,and an annelid worm.*

RNASE P

- *Ribonuclease P (Rnase P), a ribonucleoprotein, is an essential tRNA processing enzyme found in all living organisms. Since its discovery almost 40 years ago, research on Rnase P has led to the discovery of the catalytic properties of RNA, and of the only known, naturally occurring RNA enzymes.*

HAMMER RIBOZYME

- *Hammerhead ribozymes (HHRZs) are tiny autocatalytic RNAs that cleave single-stranded RNA.*
- *They are found in nature as a part of certain virus-like elements called virusoids, which use a “rolling-circle replication” mechanism to reproduce their small, circular RNA genomes.*
- *The HHRZ is so named because its secondary structure is similar to that of a hammer head, but actually its tertiary structure is more ‘Y’ shaped.*

HAIRPIN RIBOZYME

- *The hairpin ribozyme is an RNA motif that catalyzes RNA processing reaction essential for replication of the satellite RNA molecules in which it is embedded.*



ABZYMES

INTRODUCTION

- *Antibodies and enzymes share the ability to bind with compounds with great specificity and high affinity .*
- *This property has been exploited in the development of antibodies with catalytic activity.*
- *On basis difference between antibodies and enzymes is that the former binds the complementary structure and its ground state , while enzyme.binds in high energy state .*
- *Abzymes are catalytic antibodies having structural complementarity for the transition state of an enzyme catalyzed reaction .*

ABZYME

- *An Abzyme (from antibody and enzymes), also called (from catalytic monoclonal antibody), and most often called catalytic antibody, is a monoclonal antibody with catalytic activity.*
- *They bind strongly to the transition state with high association constant, enhancing the reaction rate.*
- *Abzymes reduce rotational entropy.*

SOURCES OF ABZYMES

- Abzymes are usually artificial constructs .
- They also obtained from human and animal serum .
- Found in normal humans and ii patient with autoimmune disease.
- These are capable of hydrolyzing protiens ,DNA ,RNA, polysaccharides etc.



THANK YOU