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Annals of Biological Research, 2022, 13 (6):187-188
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ISSN 0976-1233
CODEN (USA): ABRNBW

Biotransformation and Metabolism of Drugs in Gut Microbime

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Received: 28-Sep-2022, Manuscript No. ABR-22-80448; **Editor assigned:** 03-Oct-2022, PreQC No. ABR-22-80448;

Reviewed: 17-Oct-2022, QC No. ABR-22-80448; **Revised:** 24-Oct-2022, Manuscript No. ABR-22-80448; **Published:** 31-Oct-2022, DOI: 10.4172/0976-1233.005

DESCRIPTION

A drug is a synthetic, natural, or endogenous (produced by the body) molecule that affects a cell, tissue, organ, or organism biochemically or physiologically. Biotransformation is the process that alters the physiochemical properties of a drug away from those properties like lipophilicity that favor the initial absorption of the drug from gastrointestinal tract as well as its reabsorption of the drug from the kidney and gut to those properties namely hydrophilicity that favor elimination in the urine and feces. The word pharmacokinetics is used as a term to encompass these endogenous and exogenous bioactive species. Human biotransformation is of interest for several reasons. Firstly, many drugs the rate of biotransformation in the small intestine and liver determines the amount of drug that reaches the systemic circulation. Second, the rate of biotransformation in the liver determines, in part the dose of drug required to therapeutically effective drug molecule. Third, the metabolites formed by drug biotransformation must be considered in terms of their therapeutic properties and adverse effects [1].

The field includes molecular and cellular mechanisms, organ/system mechanisms, signal transduction/cellular communication, molecular diagnostics, interactions, chemical biology, therapy, medical applications, and anti-pathogenic capabilities. It also includes drug composition and properties, functions, sources, synthesis, and drug design. Pharmacodynamics and pharmacokinetics are the two primary subfields of pharmacology. Pharmacodynamics researches how a drug affects biological systems, and pharmacokinetics researches how a drug affects biological systems [2]. In general, pharmacodynamics talks about chemicals that interact with biological receptors, and pharmacokinetics talks about how chemicals are Absorbed, Distributed, Metabolised, and Excreted (ADME) from biological systems.

Although the terms are mistaken, pharmacology and pharmacy are not interchangeable. A biomedical discipline called pharmacology is concerned with the investigation, identification, and characterization of chemicals that have biological effects as well as the clarification of how cells and organisms work in connection to these chemicals [3]. Pharmacy, a health services profession, is concerned with using the pharmacology concepts taught in its clinical settings, whether it is in a dispensing or clinical care function. The main difference between the two in either discipline is how they treat direct patient care, pharmacy practise, and the scientifically rigorous research area that is fueled by pharmacology [4]. Though originally pharmacology meant simply the study of the drug effects at the macro level newer dimensions were added subsequently with the study of drugs at the molecular level. The scope further expanded with the development of drug molecules by recombinant DNA technology, by Neuro psycho pharmacology and also by pharmaco metabolics.

Neuro psycho pharmacology, a related subject, focuses on how medications affect the neurological system and psyche in combination [5]. Direct measurements of metabolites in a person's bodily fluids are made in order to forecast or assess how well pharmaceutical substances are metabolized and to better comprehend the pharmacokinetic profile of

a medicine. Pharmaco metabolomics can be used to assess metabolite levels after a medicine has been administered in order to observe how the drug affects metabolic pathways [6].

CONCLUSION

Pharmaco microbiomics examines how differences in the microbiome affect the disposition, activity, and toxicity of medications. The relationship between medications and the gut microbiome is the focus of pharmaco microbiomics. Pharmacogenomics is the use of genomic technology to find new medications and characterise existing ones in relation to the full genome of an organism. Pharmaco genetics, which focuses on individual genes in pharmacology, investigates how genetic diversity results in various pharmacological reactions. Pharmaco epigenetics is the study of the underlying epigenetic marking patterns that affect how each individual reacts to medicinal therapy differently.

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