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 The ribbon structure of Cytochrome P450 along with the SRS 7 regions and α helices (in capital letters) (Source: Denisov et.al.)

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- 1.2. (RH) binds to CYP450 near the distal region of heme moiety (Fe in 8 Fe3+ state). Electrons flow from NADPH via NADPH-P450 reductase (FAD/FMN reductase) and reduces the Fe⁺³ to Fe⁺². Fe+2RH rapidly attacks an Oxygen (O2) molecule to form Fe+2O2-RH. Fe+2O2-RH being not very stable gradually changes to Fe+3O2-RH. Which follows a second reduction of the compound to form Fe+3O2⁻²RH. The O2⁻² from the compound binds with two protons from the reaction mixture and gets cleaved to form H₂O and (Fe⁺³-O)⁺³RH. Eventually the iron bound oxygen is transferred to the substrate RH to form ROH. Summarising the entire reaction the hydrocarbon substrate (RH) is being hydroxylated to ROH via the monooxygenase activity of the Cytochrome P450.
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LIST OF SYMBOL AND ABBREVIATIONS

SYMBOL / ABBREVIATION	Full form
GC-MS	Gas chromatography-mass
	spectroscopy (MS)
HPLC	High-performance liquid
	chromatography
FMN	Flavin mononucleotide
FAD	Flavin Adenine Dinucleotide
NADPH	Nicotinamide Adenine di-nucleotide
	Phosphate
SRS	Substrate recognition sites
RH	Alkane Hydrocarbon
ROH	Alcohol Hydrocarbon
C-H bond	Carbon- Hydrocarbon Bond
РАН	Polyaromatic hydrocarbons
BrCN	Cyanogen bromide
IUPAC	The International Union of Pure and
	Applied Chemistry
GOX	glucose oxidase
ISFET	Ion Sensitive Field Effect Transistor
CME	chemically modified electrode
ENFET	Enzyme Field Effect transistor
S	Source
D	Drain
G	Gate
p	P type semiconductor
Ν	N type semiconductor
MOSFET	Metal Oxide Semiconductor Field Effect
	Transistor

EPA	Environmental Protection Agency	
Nm	Nanometre	
CYP450	Cytochrome P450	
СО	Carbon Monoxide	
DNA	Deoxyribonucleic acid	
16s rDNA	16s ribosomalDNA	
GR	Graduated Reagent	
AR	Analytical Reagent	
F	Forward	
R	Reverse	
Rpm	Rotation per minute	
mM	Millimolar	
Abs	Absorbance	
Cm	Centimetre	
MSM	Mineral salt media	
Ν	Normal	
HCl	Hydrochloric acid	
O.D.	Optical Density	
EDTA	Ethylenediaminetetraacetic acid	
MgSO4	Magnesium Sulphate	
NaOH	Sodium Hydroxide	
PMSF	Phenyl methane sulphonylflouride	
L	Litre	
μl	Microliter	
PCR	Polymerase Chain Reaction	
μmol	Micromole	
∘C	Centigrade	
MALDI	Matrix-assisted laser	
	desorption/ionization	
BSA	Bovine Serum Albumin	
DEAE	Diethylaminoethane	

mg/ml	Milligram/ml	
µg/ml	Microgram/ml	
µg/ml	Microgram/ml	
µg/µl	Microgram/ microlitre	
KCl	Potassium chloride	
SDS-PAGE	Sodium Dodecyl Sulphate	
	Polyacrylamide Gel Electrophoresis	
BME:	Beta- Mercaptoethanol	
TFA	Trifluoroacetic acid	
IISC Banglore	Indian Institute of Science Banglore	
DTT	Dithiothreitol	
NCBI	National Center for Biotechnology	
	Information	
AFC	Anion Exchange Chromatography	
GFC	Gel Filtration Chromatography	
kDa	Kilo Delton	
CYPFET	Cytochrome P450 Field Effect Transistor	
SiO ₂	Silicon Dioxide	
Slpm	standard liquid per minute	
А	Ampere	
V	Volt	
V _{GS}	Gate to Source Voltage	
V _{DS}	Drain And Source Voltage	
JFET	Junction Gate Field Effect Transistor	
ΚΩ	Kilo ohm	
NMR	Nuclear magnetic resonance	
	spectroscopy	
I _D	Drain current	
С	Concentration	
mV/Molar	Millivolt/Molar	
μΑ	Micro ampere	
	_	

PVR	Phase Volume Ratio
PEG	Polyethylene glycol
Si ₃ N ₄	Silicon nitride
mV/hr	Millivolt/hour
Ag/AgCl	Silver/Silver Chloride