Fluoroquinolone Metabolization Pathways

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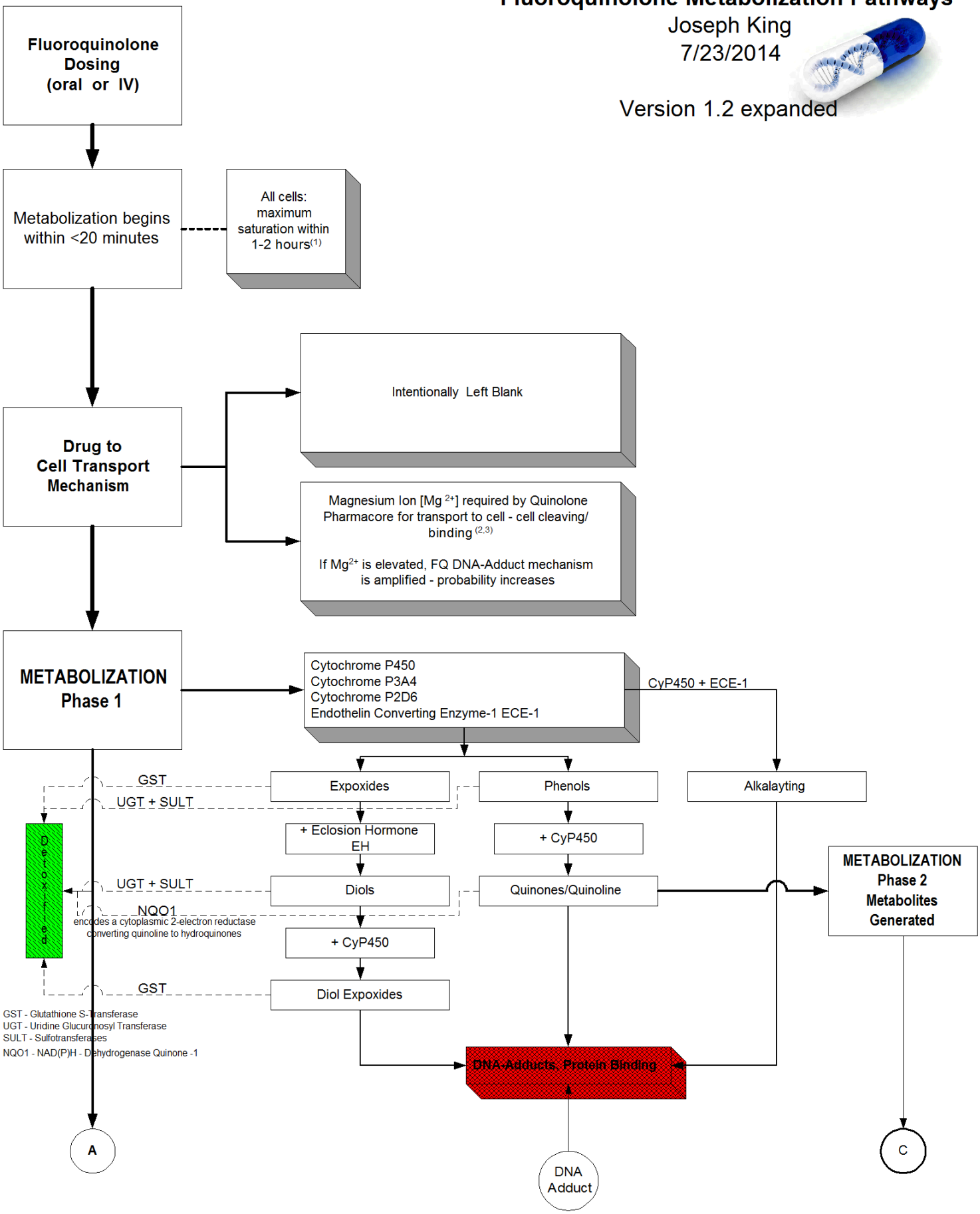
Version 1.2 expanded



A

Enzyme and Mg^{2+} Levels Determine Metabolization Thresholds

100% Metabolized

If Mg2+ Levels are low
and
Enzyme levels are adequate or elevated Metabolization Thresholds are favorable for greater Metabolization of compound

Mg2+ Levels down
Enzyme levels up
greater metabolization - detoxification

Mg2+ Levels up
Enzyme levels down
lower metabolization - detoxification
greater DNA-adduction

100% Metabolized

Fluoroquinolone completely clears body threw renal functions

Detoxified

No Permanent ADR

< 100% Metabolized

DNA-Adduct of

Unmetabolized Intact Fluoroquinolone compound

Metabolized (Metabolites) compounds originating from the Fluoroquinolone compound

***SECONDARY METABOLIZATION**

Metabolites formed during metabolization of compound and protein cleaving of compound

C

Minimum Metabolization: Ciprofloxacin, Levofloxacin, Avafloxacin, Chloroquine **intact as residue DNA-Adduct**

Metabolites [Minimum or reduced Metabolization @ <100%]

[1,5-Dimethoxy-9, 10-Anthraquinone] which is formed upon DNA cleaving of 4-quinolone antibiotic Anthraquinone

[Ethyl 6,8-difluoro-4-hydroyqinoline-3-carboxylate] the backbone to Levaquin/Levofloxin/Fluroquinolone

[1,8 Dimethoxy-anthraquinone] linked to [9,10 Anthracenedione = C14H8O2]
which forms Carboxylic Acid (back bone of all quinolones) deriving Chrysophanol an Antimicrobial Anthraquinone
Therefore: Anthraquinone derives Carboxylic Acid deriving Nalidixic Acid the 1st generation of quinolones

[2,4 diphenyl-quinazoline] which is the decomposition of Levofloxacin/Levaquin with the fluoride molecule dissipated

[6-fluoro-4-oxo-1, 4-dihydroquinoline-3-carboxylic acid [molecular mass weight of 207.00 +/-]] which is Levofloxacin/Levaquin slightly decomposed

[1,2 Dihydro-2,4-Diphenyl-Quinazoline] backbone of Cipro and Levaquin. The Dihydro is used to attach the fluoride molecule to the compound. This is a back-bone manipulator compound used to derive the fluroquinolones

Nalidixic Acid [intact, metabolized from Fluoroquinolone compound, down regulated-metabolized metabolites, and upregulated metabolites]

*Acyl Glucuronide [metabolized from Fluoroquinolone and 3-Carboxylic Acid, up and downregulated metabolites]

*Carboxylic Acid [Intact and derivatives-metabolites, up and downregulated metabolites]

Protein Bindings Enzyme Binding

Immediate DNA-Adducts

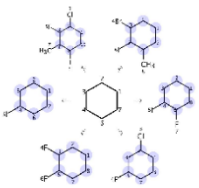
Delayed DNA-Adducts

Protein Cleaving

Gene Mutations

Protein Adducts

Chromosomal Damage

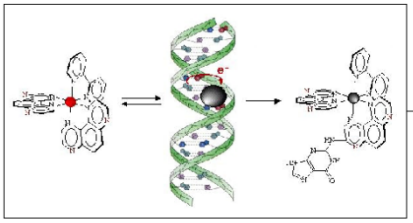


Small Molecule

+

DNA

=



DNA-Adduct