

In vitro/In vivo Correlation of Permeability of Standard Compounds Using 4 Different Cell Lines.



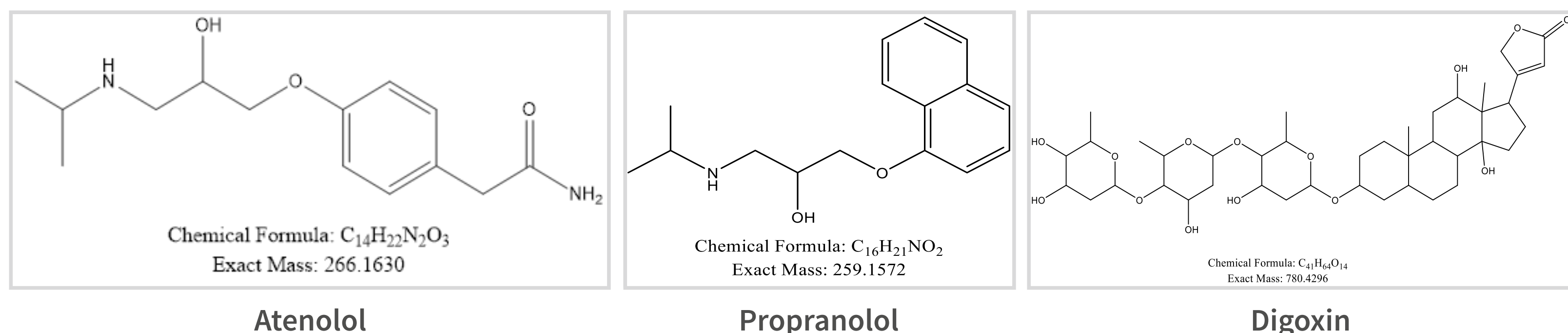
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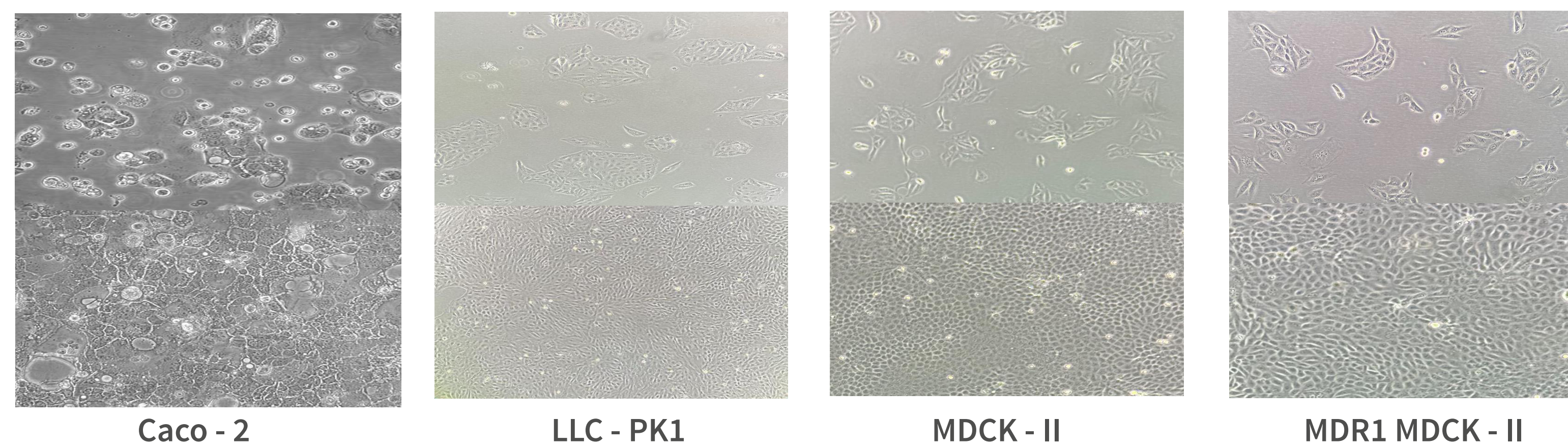
Introduction

Cell monolayer are commonly used for drug permeability screening in discovering the absorption of the drug because it mimic physical and biochemical qualities of barrier. In our study we have used multiple cell lines as comparative study of permeability and transporter for individual cell line such as Caco-2 (Human colorectal cancer cell line), LLC-PK1 (Porcine kidney cell line), MDCK-II (Madin Darby Canine Kidney cell line), and MDR1 MDCK-II (Madin Darby Canine Kidney cell line expressed with MDR1 protein). Assessed by using known standard compounds i.e. Propranolol (High Permeable), Atenolol (Low Permeable) and Digoxin (P-gp Substrate).

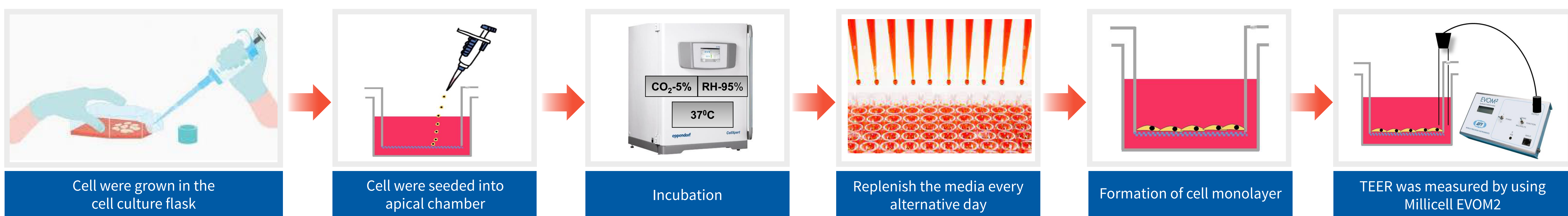
Materials



Cell Lines

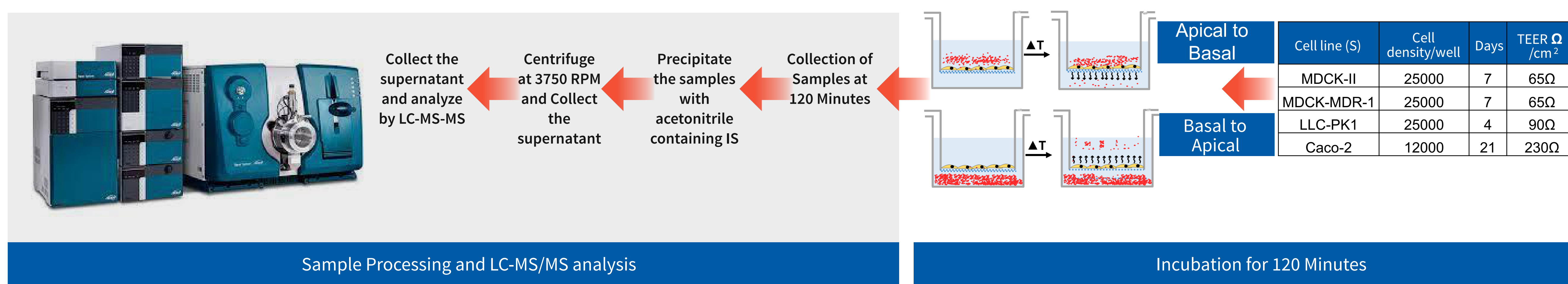


Methodology:

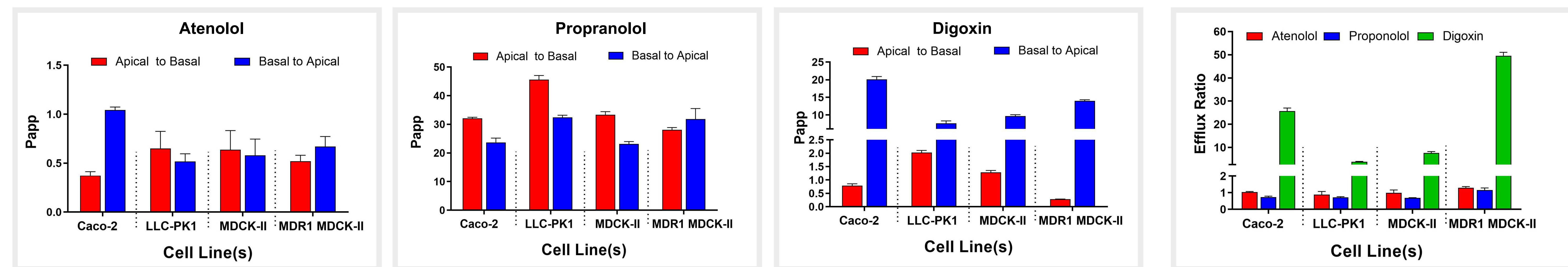


$P_{app} = dQ/dt \times 1/Co \times 1/A$
 dQ: Amount collected in the basolateral compartment of the 96 well filter plate
 dt: Time of incubation of drug on the cell monolayer.
 Co: Initial concentration of drug in the apical compartment of the well.
 A: Surface area of the filter.
 Efflux ratio: Papp of basal to apical samples / Papp of apical to basal samples.
 Recovery: $\{(dQ \text{ of Apical} + dQ \text{ of Basal}) / \text{Standard } dQ\} \times 100$.

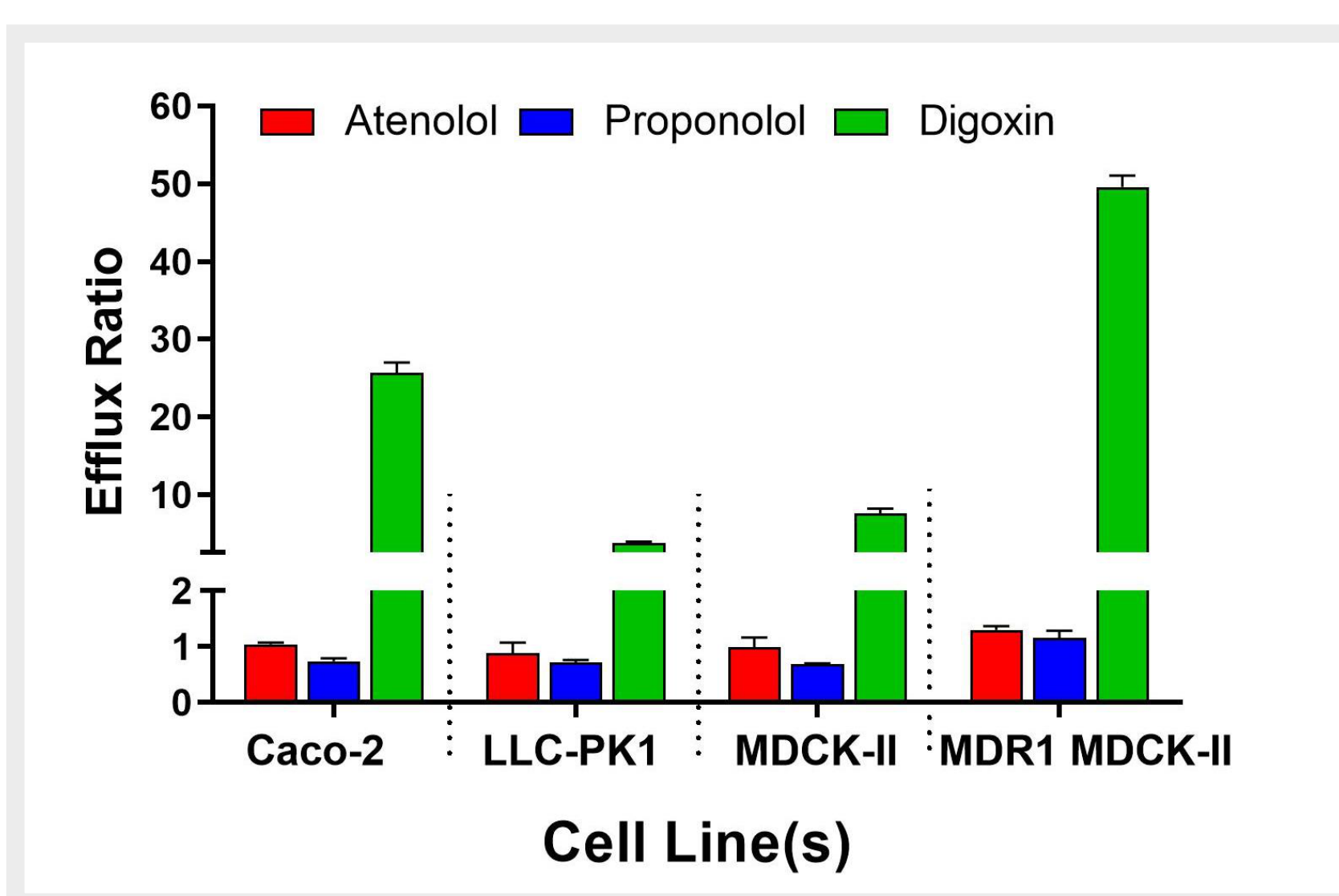
Calculation



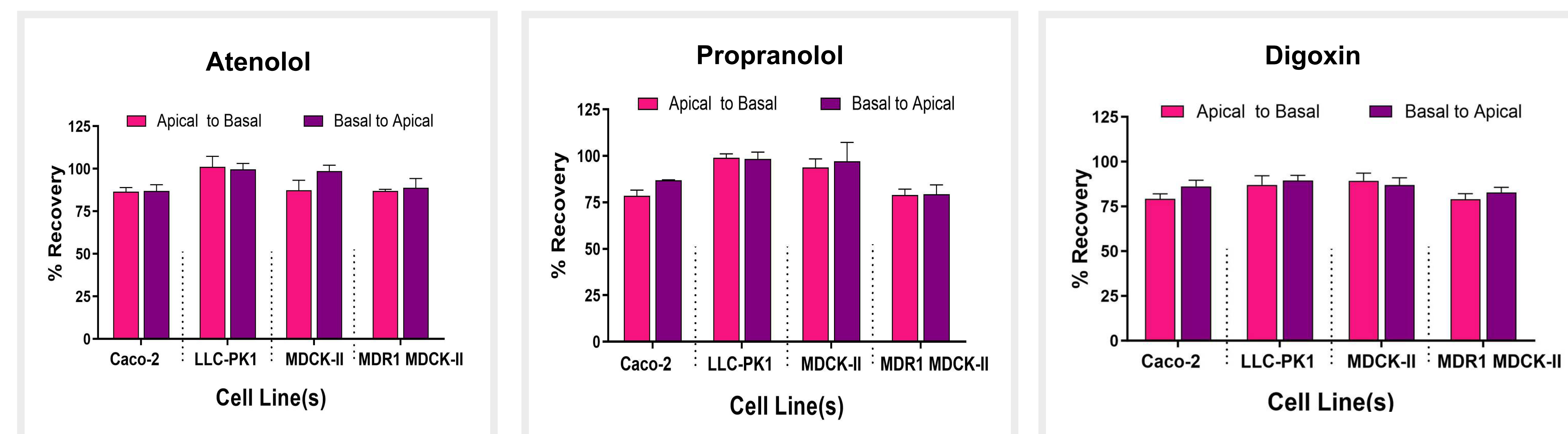
Papp of the Compound on Four Cell Lines



Efflux Ratio



Compounds Exhibited Better Recovery in Both Apical and Basal.



Conclusion:

Atenolol exhibited low permeability, Propranolol indicated high permeability but Digoxin represents the high efflux compounds subjected to transporter protein in involved in all four cell line. This study suggested how variability of cell line guiding in the drug permeability.

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