Drugs!
Theme Based Teaching and Learning

Anna Hull - Lincoln University
Michael Weir, Mark Baillie - University of Delaware
Motivation

- Anna: integrating all the STEM disciplines at Lincoln around one common theme: “Drug use and abuse”
  - Focus:
    1. quantitative & critical thinking skills
    2. communication & research
- Mark: hooks using one theme to catch students’ interest
- Michael: integrative chemistry and biology themes that can be used to develop critical thinking and quantitative skills in the integrated studios at UD
Method (gathering information)

In depth exploration of Case repositories
Cases Online (Emory)
Enduring Legacies Native Cases
ICBL
Case it!*
PBL Clearinghouse*

Case It!

CASES Online
Creating Active Student Engagement in the Sciences

NSF National Center for
Case Study Teaching in Science
Organize and Indexing

Google Docs

Caffeine
It's not just in coffee anymore. It may be in your...
Jelly Beans
Waffles
Gum
Water
Syrup

Drug cases index

Drug Related Cases...

Non-case resources...

Drug Related Cases...

Drug Related Cases...
Example

Index

Biology-Chemistry: Activities
Plants
Quantitative

Example 1: Pharmacokinetics

A following example is given below to illustrate the role of half-life in pharmacokinetics to determine the drug dosage interval.

Dosage interval of drug A

The therapeutic range of drug A is 20-30 ng/ml. As the half-life of the drug is 6 hours, the concentration will decrease over time. To ensure its maximal effect of the drug in the target, the administration will be monitored so that the minimum serum concentration will never go lower than 20 ng/ml, and the maximum serum concentration will never exceed 30 ng/ml.

As a result, it is important to administer drug A at the right time to ensure its effective therapeutic range.

Another important application of half-life in pharmacokinetics is that half-life time for many drugs is influenced by the enzyme (CYP3A4). The smaller the value of $t_{1/2}$, the higher the affinity bending of drug to its target ligand, which is an important aspect of drug design.
Future Directions

- Sharing – Google docs
- Collaborative Editing?
  - or request editing?

https://www.atlassian.com/git/workflows#workflow-centralized
Thank you!

All bioquesters!
Special thanks to Tony and Pat!