UNIVERSITY of MARYLAND
SCHOOL OF PHARMACY

# Olsen's "Standard Book of British Birds"?
# Selecting Appropriate Resources for Pre-matriculation Programs

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## Background

Maryland Academy for Pharmacy Success (MAPS) was envisioned as a value-driven PharmD pre-matriculation program that leveraged open access content (Open Educational Resources, OER), yet initial discussions as to which resources should be included led to a list that read like the classic Bookshop sketch by John Cleese and Marty Feldman (https://www.youtube.com/watch?v=Me3f7rI9AOkn).

This poster will review the approach used to ensure coverage for chemistry/biochemistry courses while keeping the resources focused.

## What is needed?

We assessed the stated learning outcomes for prerequisite courses for entry to Maryland, held discussions with first-year science course managers on their expectations for the level of prerequisite knowledge, and used the over 20 years of pharmacy educational experience of the lead author to decide which basic science concepts and topics should be covered, and to what depth. An important component was which topics should not be covered.

Maryland Science Pre-requisites include: General Chemistry; Organic Chemistry; Physics; Biology, Microbiology; and Human Anatomy and Physiology.

First year science course managers were specifically asked which topics were historically problematic for many students. The answered ranged from fundamental principles of thermodynamics, kinetics, and acid/base chemistry, to specific examples of not being able to describe the components of a protein or a cell.

## Cannot reteach everything…

The data gathering led to an extensive list of resources and suggestions for students to review, including very specific areas faculty considered important (hence the name of the poster).

Assessing the syllabi where available of undergraduate institutions, along with general expectations of faculty, it was decided to focus on one main area per week over 4 weeks of science MAPS (the other weeks were more focused on preparation for IPE, professionalism, skills lab, and co-curricular activities). The areas chosen were:

1. Structure of macromolecules
2. Function of macromolecules
3. Principles of drug action
4. Physical and Pharmaceutical Chemistry

Each week was split into three main key learning outcomes, which directed topics to be included. The depth of content was more difficult to quantify, but it was clear to the authors that faculty were expecting (at least) AP-level science.

## Approach to choosing OERs

Various textbook and video-based AP Chemistry and AP Biology level OERs were identified based on topic alignment and instructional depth. Chemistry faculty conducted a detailed OER content analysis establishing content consensus on selected materials. Editing further focused content eliminating unnecessary content in textbook OERs using a Creative Commons Attribution license to focus topical relevance for pharmacy students. These were structured into modules that aligned with P1 coursework using modified OER chapter questions to create formative MAPS module assessments.

## Sub-topic areas

*Structure of macromolecules:*
Proteins; Nucleic acids; Lipids

*Function of macromolecules:*
Translation vs. Transcription; Enzymes as catalysts; Transporters

*Principles of drug action*
Enzyme inhibition; Receptor activation and antagonism, Cell structure

*Physical and Pharmaceutical Chemistry module:*
Thermodynamics vs. Kinetics; Acid/Base chemistry; Solubility

## Conclusions

OERs exist in numerous formats and forums, but a structure is required to focus the student's learning to ensure all material focuses on success in the PharmD curriculum. Adoption and modification of OERs using Creative Commons Attribution licensing provides an opportunity to customize material for pharmacy applications without necessitating the creation of entirely new materials.

## Resources

AJPE, **2021**, 85 (6) 8214

AJPE **2019**; 83 (7) 7021

Starting Strong! Pre-matriculation Programs, Summer Review, and Structured New Student Orientation During Post COVID Times, AACP Annual meeting 2022.

## Link to classic "Bookshop" sketch

SCAN ME