

Report

Teagle-LVAIC Project

On-Line Course

In

How Drugs are Developed

March 22, 2018



What Did We Do?


- **Full modular yet fits a standard course format**
- **Web-based readings (easily refreshed)**
- **Based on specific competencies of faculty**
- **Repeat format for each module**


Content Structure


- **27 Modules (16 minutes to 120 minutes)**
- **2 Introductory**
 - a) **meet the team**
 - b) **outline of the course**
- **25 content**
 - 14 modules are presented by non-Lehigh LVAIC faculty**
 - 11 modules presented by N. D. Heindel**
- **Study Questions**
- **Learning Objectives**
- **On-line readings (no text book)**

What does the platform look like?

--- Module 4 ---

 Module #4A - At a Molecular Level How Do Drugs Work?
(Panopto)


 Module #4B - How do Drugs Work? (Panopto)

 Module 4 PPTs

 Module 4 Readings and Study Questions

 **Audio-video**

--- Module 5 ---

 Module #5 - Computational Approaches to Drug Discovery
(Panopto)


 Module 5 PPTs

 **Power Points (annotated and clean)**

--- Module 6 ---

 Module #6A - Where Do Drugs Come From (Panopto)

 Module #6B - Where do Drugs Come From (Panopto)

 Module 6 PPTs


 Module 6 Readings and Study Questions

 **Outside readings and Study Questions**

--- Module 7 ---

 Module #7A - Drugs from Natural Sources Plants to Medication

 Module #7B - Drugs from Natural Sources Plants to Medication

 Module 7 PPTs

How the Product is Being Used

- **As topical modules**

- Husic (Lafayette) as advanced topics in Biochem Course (Spring 2017)
- Staretz (Cedar Crest) in Biochem Course (Fall 2017)
in Toxicology Course (Spring 2018)

- * **As a package of modules**


- * Bertucci Bio-organic and Medicinal Chemistry (Fall 2016, Spring 2018)
- * Young Half-course in Medicinal Chemistry (Fall 2017)
- * Mayville Course in Medicinal Chemistry (Spring 2018)
- * Heindel Three classes (undergrad, grad, DE = 22) (Spring 2017)

Each Institution's Situation is Unique



Search this recording

Contents		Module 1
Notes	Module #1 Hail, Hail, the Gang's All Here "Oh...	0:00
Bookmarks	About the Teagle Foundation & LVAIC	2:08
Discussion	About Michael Bertucci	2:10
	About Fran Mayville	3:46
	About Marianne Staretz	8:06
	About Sherri Young	8:07
	About Ned Heindel	10:19
	About David Husic: Biographical Contact: husich...	12:49
	About David Husic: Expertise and Experience	13:56
	Ph.D...	



Medicinal
Chemistry

Module #1

Hail, Hail, the Gang's All Here

"Oh brave new world that has such people in it." W.S

Presenters:

- John Meier -- representing LVAIC**
- Michael Bertucci – Moravian College**
- Francis Mayville -- DeSales University**
- Marianne Staretz – Cedar Crest College**
- Sherri Young -- Muhlenberg College**
- Ned Heindel -- Lehigh University**
- H. David Husic -- Lafayette College**

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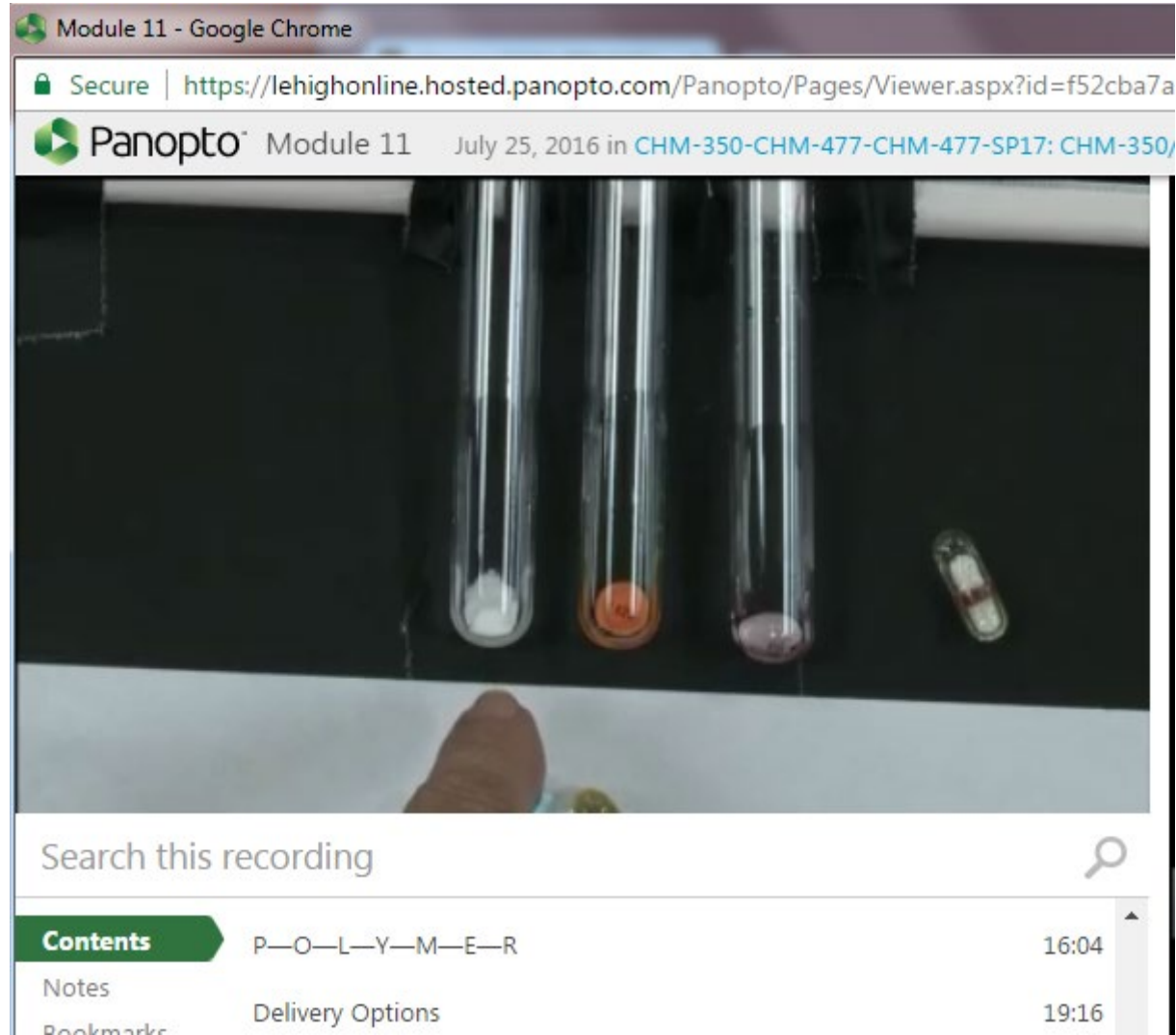








The Medium Allows Close-up Views



The screenshot shows a web browser window with the following details:

- Browser: Google Chrome
- Page Title: Module 11
- URL: <https://lehighonline.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=f52cba7a>
- Video Player: Panopto
- Recording Date: July 25, 2016
- Recording ID: CHM-350-CHM-477-CHM-477-SP17: CHM-350,

The video content shows a close-up of three test tubes containing white, orange, and pink substances, and a pill on a white surface. A hand is visible at the bottom of the frame.

Search this recording

Section	Content	Duration
Contents	P—O—L—Y—M—E—R	16:04
Notes		
Bookmarks	Delivery Options	19:16

Closed Captioning

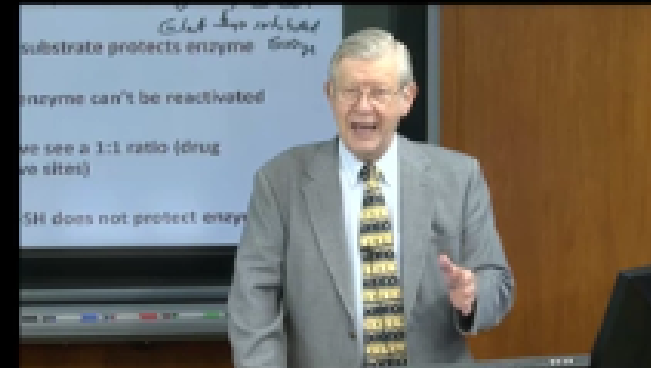
Video

About



TESTS FOR SUICIDE INHIBITION

- 1) Two Rates – the enzyme rx (k_{cat}) & the inactivation rate (may be =, may not see 2)
*D → E lect
E lect → inhibited*
- 2) Added natural substrate protects enzyme
ENZYME
- 3) “deactivated” enzyme can’t be reactivated
- 4) In ideal cases we see a 1:1 ratio (drug molecules/active sites)
- 5) Added Ph-CH₂-SH does not protect enzyme



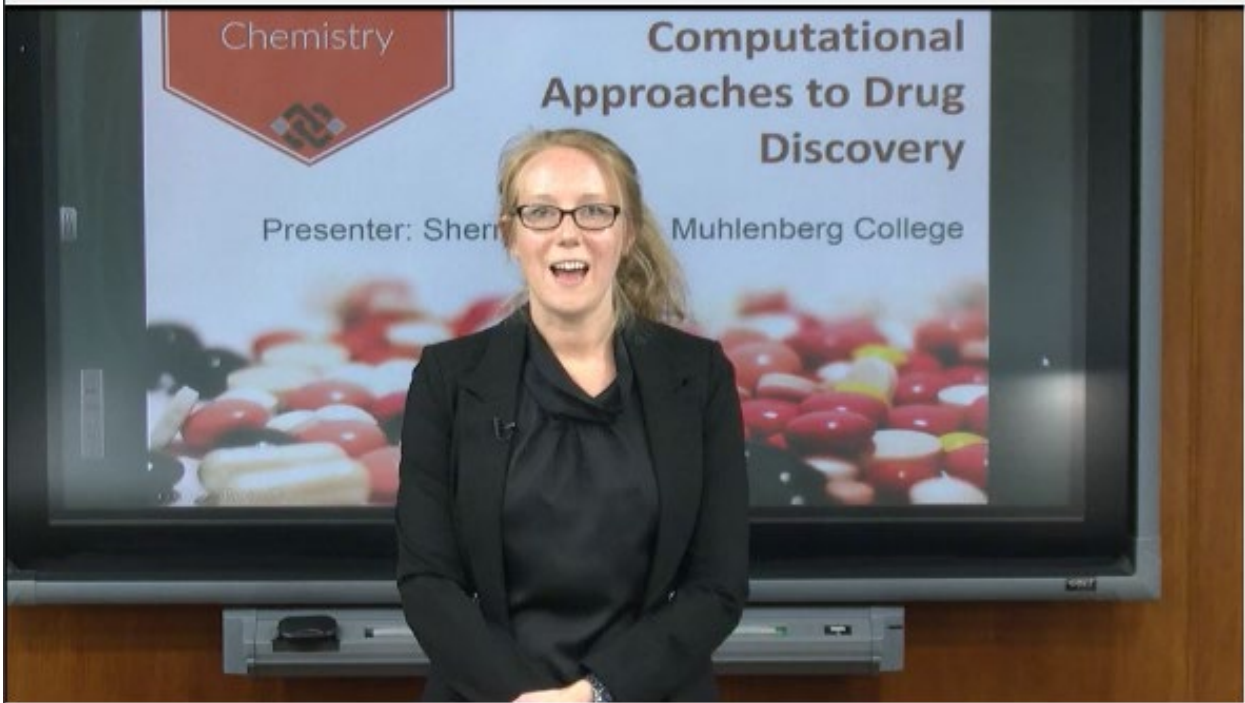
because it's a mimic of a natural ligand for the enzyme

A Report on the Muhlenberg College Experience

Module 05 - Google Chrome

Secure | <https://lehighonline.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=9493711>

Panopto® Module 05 July 13, 2016 in CHM-350-CHM-477-CHM-477-SP17: CHM-350



Chemistry

Computational Approaches to Drug Discovery

Presenter: Sherri Young, Muhlenberg College

Search this recording

Contents	Dr. Sherri Young - Muhlenberg	
Notes	Presenter: Sherri C. Young, Muhlenberg College	0:00
Bookmarks	Google the following terms to obtain definitions:	0:41

A Report on the Moravian College Experience



Select Comments from Teaching Evaluations:

- “The video lectures were great/very helpful”
- “Let the pre-work (videos) be a little more doable for med chem, 3-4 hours of video lecture is a bit too intense”
- “Select specific study questions from the (video) lectures. Often there were many which did not apply.”
- “Lecture a bit more instead of worksheets”
- “Taking this class inspired me to consider a career in pharmacology or medicinal research”



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CROSS-INSTITUTIONAL BLENDED LEARNING IN MEDICINAL CHEMISTRY

by Michael Bertucci

What happens when you put six organic chemists in a room and give them a video camera? This past summer, assistant professor Michael Bertucci and five other chemistry professors from other LVAIC (Lehigh Valley Association of Independent Colleges) institutions collaborated on developing a hybrid course in medicinal chemistry. Blended or hybrid learning is a pedagogical technique that is emerging nationally in both secondary and higher education. It combines technology with traditional classroom methods, allowing students to engage with online videos, simulations, activities, etc. to introduce or augment content presented by the instructor. Funded by a grant from the Teagle Foundation to encourage cross-institutional blended learning, the team of six prepared and recorded a series of online modules (or video lectures) on a variety of topics, individually or as a duo, depending on their area of expertise. In total, 27 modules were created covering topics ranging from the drug development process to status reports in pharmaceutical interventions for cancer, infectious disease (i.e. – bacterial infections and viruses), and Alzheimer’s disease.

After the contributions from Moravian, Lehigh, Muhlenberg, Lafayette, DeSales, and Cedar Crest were compiled at the end of the summer, Bertucci employed the expertise of all six professors in a new course at Moravian entitled Bioorganic & Medicinal Chemistry. The course was taught using a “flipped classroom” approach, in which students viewed one of the pre-recorded modules outside of class and participated in a variety of related

What Lehigh Learned from 2 Flipped Classes

RED = Fall '17 (14); BLUE = Spring '17 (19)

Course score 1-5; Dept 1-5; College 1-5

- Overall quality 4.57, 4.23, 4.31 4.66
- Would recommend this class 4.43, 3.65, 4.16 4.83
- Instructor was effective in discussions 5.00, 4.64, 4.37 (no such question)
- Assignments helped me learn material 4.57, 4.26, 4.36 4.28
- Course objectives were clear 4.79, 4.34, 4.41 4.77
- I learned a great deal 4.29, 4.20, 4.28 4.83
- Anecdotal remarks (12/14) Re: on-line/flipped 3 (--), 1 (-), 1 (+), 7 (+)
(5/19) Re: on-line/flipped 2 (-), 3 (+) [didn't insist on ans.]

Examples of Lehigh Student Comments

- One of top 5 most useful courses I've ever taken, for sure
- I'm a chem eng so I was lost through the org chem, really enjoyed the process stuff and enjoyed the business exposure that was injected from time-to-time
- I found the modules and the use of on-line hard to follow
- Enjoyed 80% of the modules
- Grad students should have had to do more work (2 comments)
- Didn't find the in-class session very useful, I prefer not to keep-up and so answers were being worked on modules I had not yet covered
- I don't use TV to learn from; prefer live lectures, fewer problem sessions (2X)
- Didn't mind flipped style but would prefer traditional approach (2X)
- I liked the on-line learning for its flexibility; I want to learn at my pace

What have we Learned?

- **Very hard to avoid some overlap**
- **Each presenter may not be familiar with the curricula at other schools**
- **Some students abuse the freedom unless course is firmly structured**
- **The whole is greater than the sum of its parts**