



AMERICAN CHEMICAL SOCIETY KENTUCKY LAKE SECTION

March 2018 Kentucky Lake Section Meeting

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**Boling University Center, Room 206
University of TN at Martin
Wayne Fisher Drive
Martin, TN 38238**

Thursday, March 29th, 2018

Dinner @ 6:00 pm, Presentation @ 7:00 pm

Dinner: A deli buffet including salads, breads, meats, cheeses, and
desserts

The price is \$10 (Students \$5)

Program: Drug Design: From Hit to Lead, A SAR Success Story

Dr. Elizabeth Thomas, Visiting Assistant Professor of Green
Chemistry Berea College

Science Center: Bring your kids for fun with the periodic table and
glassware!

Comments from the Chair

Greetings KLS Members,

This month we will be hearing from Dr. Elizabeth Thomas, a visiting professor at Berea College. Dr. Thomas is a graduate of the University of Kentucky and spent 6 years working as an organic chemist at Eli Lilly. Those of you who enjoy pharmaceutical chemistry won't want to miss this event!

See you next week,

Genessa

Don't forget: The 41st Annual Area Collegiate Chemistry Meeting is April 7th at UT-Martin. Deadline to submit for oral or poster presentation is April 3rd.

KLS-ACS 2018 Officers

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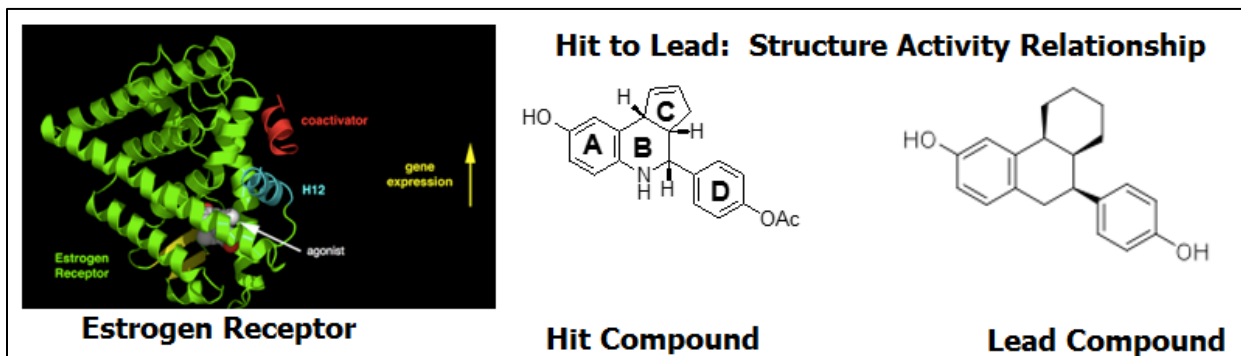
<http://kentuckylake.sites.acs.org/>

Drug Design: From Hit to Lead, a SAR Success Story

ACS Meeting Thursday March 29th, 2018, Martin, TN

Elizabeth M. Thomas, Ph.D.

Visiting Assistant Professor Chemistry, Berea College, Berea, KY



ABSTRACT:

Small synthetic drug molecules are synthesized and evaluated as an estrogen receptor beta (ER β) agonist for the therapeutic target, prostate cancer. ER β was isolated from human and rat prostate in 1996. ER β is a nuclear receptor located in the following tissues: blood vessel endothelia, bone, lungs, urogenital tract, CNS, prostate, and mammary. Estradiol is the body's endogenous ER ligand which binds the ER with an affinity of a K_i of 0.2 nM. In this project, we were able to successfully take a hit compound with an ER β binding K_i of 23 nM, make structural changes (Structure Activity Relationship, SAR) to develop a lead compound. The lead compound binds the ER β 100 fold stronger than our hit compound, and also binds slightly stronger than the endogenous ligand. One portion of the SAR is explored in detail including the synthetic reactions that led to the lead compound. The synthetic chemistry includes a multi-step synthesis with many reactions covered in organic chemistry I and II. These reactions include the Buchwald reaction, the Wittig reaction, catalytic hydrogenation, conversions of carboxylic acids to acid chlorides, saponification, Friedel-Craft acylation, and sodium borohydride reductions of carbonyl compounds. This work was patented in August 2006 (Thomas, Elizabeth Marie; Norman, Bryan Hurst; Kroin, Julian Stanley. Substituted tetralins as selective estrogen receptor-beta agonist. WO2006088716A1, August 24, 2006).

BIO:

Elizabeth graduated with her BA degree in science education from the University of Kentucky and then with her MS degree from the University of Louisville. It was at the University of Louisville under the direction of Dr. Frederick A. Luzzio, that she learned the art and skill of organic synthesis. Upon graduating from the University of Louisville, Elizabeth worked as a research organic chemist in drug design in the cancer therapeutic area at Eli Lilly and Company, Indianapolis, Indiana. After six years, Elizabeth relocated to Lexington, Kentucky for family reasons. While in Lexington, Kentucky, she taught chemistry part-time in high schools and at the University of Kentucky, researched polymers at Lexmark, formulation chemistry for nasal sprays at Summit Biosciences Inc, and reviewed laboratory data for FDA approval at Piramal. Elizabeth went back to school to pursue her PhD. at the University of Kentucky in 2010. She received her Ph.D. from the University of Kentucky in August 2016. She is currently a visiting assistant chemistry professor at Berea College in Berea, Kentucky.