

**Abstract:** Boron (in its borax form) has been used in pottery glazes since 300 AD. Over the years, it has been used extensively in materials (borosilicate glass, boron carbide ceramics, metal coatings, detergent formulations, nuclear commercial shielding, insecticides, etc.) even though boron makes up less than 0.0002% of the earth's crust. Modern use of organic compounds containing boron (organoboranes) dates back just over 50 years but is now ubiquitous in modern organic chemistry synthesis. The use of organoboranes as precursors to isotopically labeled materials has been of continuous interest in our laboratory for over 25 years because boron compounds can be prepared containing a wide variety of functional groups and are generally easy to separate from the targeted products. We have developed a number of organoborane-based reactions that are valuable for the preparation of molecules of use in medicine and agriculture, including tomographic imaging applications.

The presentation will provide a personal overview of our development of organoborane transformations of utility in medical applications. The discussion will include overviews of tomographic (PET and SPECT) imaging of physiological process in living systems and their application in the treatment of cancer.

**Biographical Sketch:** Professor Kabalka received his B.S. from the University of Michigan and completed his Ph.D. at Purdue University. He joined the faculty at The University of Tennessee in 1970. From 1978 through 2015, he also served as Professor of Radiology where he held the Robert H. Cole Chaired Professorship and was Director of Research, in Radiology, at the UT Medical Center in Knoxville.

He has received numerous awards, including the Southern Chemist Award, the UT Alumni Distinguished Professorship, The Robert H. Cole Endowed Professorship, the Purdue University Outstanding Alumnus Award, and a number of teaching awards. Professor Kabalka was recently named the UT Panhellenic Outstanding Faculty Member of the Year. He has served as a consultant to three National Laboratories and is on the Boards of eight journals and foundations.

Professor Kabalka's research interests are focused on the creation of new synthetic pathways involving organoboron reagents. Non-traditional methods involving ionic liquids, solid supports, and microwave irradiation play significant roles in his research. In addition, Professor Kabalka maintained an active nuclear medicine program centered on the design and synthesis of boronated pharmaceuticals for use in the treatment of cancer and in the preparation of drugs labeled with short-lived isotopes for use in positron emission tomography (PET). He has published over 550 articles in refereed journals. In addition, Professor Kabalka has made more than 300 invited presentations at universities, laboratories, and meetings throughout the world. His research has been continually supported by the National Institutes of Health and the U.S. Department of Energy.

In June of 2016, Professor Kabalka will retire from UT and become Emeritus after 46 years of teaching Chemistry <https://www.chem.utk.edu/news/kabalkaretire>.

East Tennessee Section  
American Chemical Society  
[www.chem.utk.edu/~acs](http://www.chem.utk.edu/~acs)



## 2016 Awards Banquet

### *Dr. George W. Kabalka*

Professor of Chemistry, University of Tennessee, Knoxville  
Alumni Distinguished Service Professor, UT- Knoxville  
Robert H. Cole Professor Emeritus, UT- Memphis

*“Boron: Basic Science to Modern Medicine  
(A Personal Journey)”*

Calhoun's on the River Restaurant, Knoxville  
May 5, 2016

### ***50-Year ACS Members***

Dr. Walter Farkas  
Dr. Roger McDermott

Mr. Jack Hall  
Dr. Joseph Peterson

### ***60-Year ACS Members***

Dr. Donald Kleinfelter

Dr. Alexander Van Hook

### ***ETS-ACS Past Chair Pin***

Ms. Rachel Glazener (Pellissippi State Community College)

### ***Graduate Fellowship Award***

Xinyi Lu (University of Tennessee, Chemistry)

### ***Undergraduate Senior Award***

Hannah Oakes  
(Lincoln Memorial University, Chemistry)

Parker Dryja  
(Maryville College, Chemistry)

Madeline Stark  
(University of Tennessee, Chemistry)

Konstantin Sedov  
(University of Tennessee, Chemical Engineering)

### ***ETS-ACS Chemistry Teacher of the Year***

Elissa LaPointe  
(West High School)

### ***ACS Chemistry Olympiad National Certificates***

**Olympiad Committee:** Chair, Dr. Al Hazari  
Members, Drs. Ben Xue and Brian Long

Lily Turaski (Cedar Springs Homeschool, Knoxville)

Nalin Varna (Farragut High School, Knoxville)  
and

Lily Gao (Farragut High School, Knoxville)  
Teacher – Debbie Fraser

Mason Watson (Grainger County High School, Rutledge)  
and

Larissa Copley (Grainger County High School, Rutledge)  
Teacher – Charles Anderson

Stacy Bruce (Heritage High School, Knoxville)  
Teacher – Tommy Bird

Joseph Andress (Oak Ridge High School, Oak Ridge)  
and

Albert Xue (Oak Ridge High School, Oak Ridge)  
Teacher – Sharon Thomas

Ben Link (West High School, Knoxville)  
and

Walker Smith (West High School, Knoxville)  
Teacher – Elissa LaPointe