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Professor Warner is an analytical chemist with more than 300 refereed publications in a variety of journals relevant to his general area of research. He has particular research expertise in the area of fluorescence spectroscopy, where his research has focused for more than 35 years. He is considered one of the world's experts in this analytical spectroscopy. For example, he is the corresponding author in the highly cited biannual reviews on "Molecular Fluorescence, Phosphorescence, and Chemiluminescence Spectrometry", for the journal, *Analytical Chemistry*. Over the past 20 years, he has also maintained a strong research effort in the areas of organized media and separation science.

Professor Warner has been performing research in the more specific area of analytical measurements using ionic liquids (ILs) for several years. It is this research on ionic liquids which has led to the recent conceptualization and implementation of a group of uniform materials based on organic salts (GUMBOS) as novel materials which can be exploited for a variety of applications. Novel nanoparticles (nanoGUMBOS) have been derived from these materials which can primarily be classified as frozen ILs. However, some GUMBOS are not ionic liquids since they do not fit the traditional definition of ILs. The utility of these materials is that they provide solid phase materials with the same tunability of ionic liquids. Several publications in key chemistry journals (e.g. JACS, Nano Letters, ACS Nano, Analytical Chemistry, Chemical Communications, and Langmuir) and pending patents have resulted from this area of research. In addition to his fundamental research, he has developed strategies to encourage undergraduate and graduate students (particularly from underrepresented groups) to go on to pursue terminal degrees in the STEM discipline. Through his fundamental and educational research, Professor Warner has produced 54 PhDs and 100s of undergraduates who have gone on to terminal degrees in various disciplines.

### Moving Ionic Liquid Chemistry into the Solid Phase

My research group has been exploring the analytical applications of room-temperature ionic liquids (RTILs) for several years. More recently, we have extended the range of these materials to include analytical applications of similar solid materials, i.e. organic salts with melting points of solid ionic liquids (25 °C to 100 °C) up to melting points of 250 °C. To contrast these new materials with RTILs, we have created the acronym, GUMBOS (Group of Uniform Materials Based on Organic Salts). These GUMBOS have the tunable properties frequently associated with RTILs, including tunable solubility, melting point, viscosity, thermal stability, and functionality. Thus, when taken in aggregate, these properties allow production of solid-phase materials that have a wide range of applications in broad areas of the sciences. In this talk, I will

highlight the applications of GUMBOS which we have recently explored in the sciences, including GUMBOS as sensors, imaging agents, stimuli-responsive materials, cancer therapy, energy applications, and for production of nanoGUMBOS. In regard to nanoGUMBOS, we believe that our methodology represents an extremely useful approach to production of nanomaterials since our materials are designed and assembled for specific uses, rather than adapted for use as is done for many nanomaterials. Selected applications, including sensor and energy applications will be highlighted in this talk.