

# TEXAPHYRINS AS DRUG CANDIDATES: LIFE DEATH AND ATTEMPTS AT RESURRECTION

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## ABSTRACT

This lecture will present a personal story of a 3x cancer survivor and how with the assistance of great coworkers and collaborators an effort has been made to fight back against this disease by studying the chemistry and anti-cancer biology of expanded porphyrins. Expanded porphyrin is a term we introduced into the literature in 1988 to describe larger homologues of natural blood pigments, such as the dyes (called heme) that make blood red.[1] Many expanded porphyrins are now known.[2] They have seen application in areas as diverse as anion recognition (capturing species with negative charges) and extraction (removal of pollutants from waste streams), photodynamic therapy (where light is used to burn out a cancer), and aromaticity (a fundamental property of organic chemistry).[3]

In this presentation, the focus will be on a set of expanded porphyrins called texaphyrins. These compounds were named for the State of Texas due to their size. Two of the texaphyrin complexes, known as MGd and MLu, were the founding technology for Pharmacyclics, Inc., a company that later developed a best-selling leukemia drug and was acquired by AbbVie for \$21B in 2015. New work exploiting lessons learned from the early days of Pharmacyclics, Inc. and leading to the creation of a new drug lead, oxaliTEX-Pt(IV), targeting platinum-resistant ovarian cancer, will then be described in detail.

*This work has benefited from support from the U.S. National Science Foundation, The National Institutes of Health, the Cancer Research and Prevention Institute of Texas, as well as the R. A. Welch Foundation. Productive collaborations with a number of groups, including those of Profs. Dongho Kim, Jong Seung Kim, Shunichi Fukuzumi, T.K. Chandrashekar, Christophe Bucher, Dirk Guldi, Pradeepta Panda, Changhee Lee, Jan Jeppesen, Masatoshi Ishida, Zahid Siddik, Rick Finch, and Tomas Torres, are also gratefully acknowledged. Special thanks are due to Jonathan F. Arambula and Gregory Thiabaud.*

*Note: The author has an interest in Cible, Inc., which has an option to license OxaliTEX-Pt(IV).*

## REFERENCES

- [1] Sessler, J. L., Murai, T., Lynch, V. and Cyr, M. "An 'Expanded Porphyrin': The Synthesis and Structure of a New Aromatic Pentadentate Ligand", *J. Am. Chem. Soc.*, 110 (1988), pp 5586-5588.
- [2] See for instance: Ishida, M., Kim, S.-J., Preihs, C., Ohkubo, K., Lim, J. M., Lee, B. S., Park, J. S., Lynch, V. M., Roznyatovskiy, V. V., Sarma, T., Panda, P. K., Lee, C. H., Fukuzumi, S., Kim, D. and Sessler, J. L. "Protonation-coupled Redox Reactions in Planar Antiaromatic *meso*-Pentafluorophenyl-substituted *o*-Phenylene Bridged Annulated Rosarins", *Nature Chem.*, 5, (2013), pp 15-20 (cover).
- [3] For a special issue on porphyrin analogues, see: Sessler, J. L., Gross, Z. and Furuta, H. "Introduction: Expanded, Contracted, and Isomeric Porphyrins", *Chem. Rev.* 117 (2017), pp 2201–2202 (editorial) and ensuing papers.