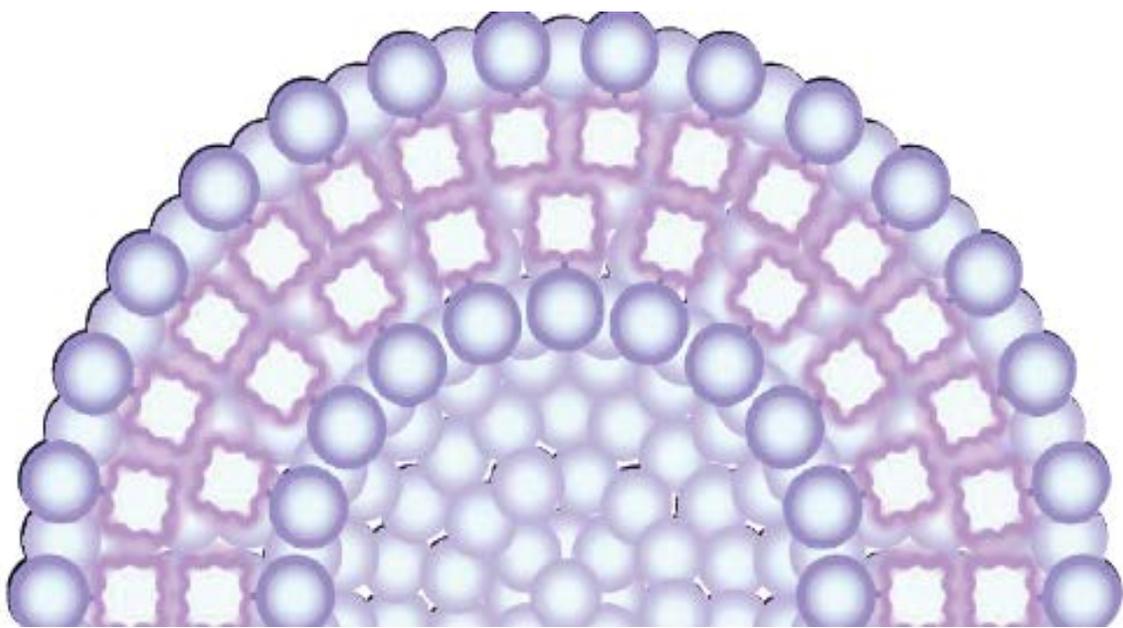


# PORPHYYSOME



# Porphysome

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## Executive Summary

A porphysome is a spherical nanovesicle that is formed from self-assembled porphyrin (an organic compound that is found in naturally occurring compounds like hemoglobin and chlorophyll) and lipid bilayers with a diameter of 100 nm. Porphysomes were listed as one of the top 10 cancer breakthroughs of 2011 by the Canadian Cancer Society.

## Team

Dr. Gang Zheng and his team at the Ontario Cancer Institute at the University Health Network were interested in attaching an optically active porphyrin group to a liposome, an artificial vesicle that is used as a vehicle for drug delivery. Since Porphysome's inception, Michael Valic has been hired as a Project Manager. Michael brings years of experience working with the porphysome technology and liaising with industry and government.

## Target Market

The optical properties and biocompatibility of porphysomes demonstrate the multimodal potential of organic nanoparticles for biophotonic imaging and therapy. Porphysome technology is multi-modal multi-functional contrast agent for use in diagnosis and accurate localization of tumor, as well as treatment. Drug-delivery nanovesicles can be targeted to a specific cancerous tissue.

## Clinical Need

Local disease control is a major challenge in pancreatic cancer treatment, because surgical resection of the primary tumor is only possible in a minority of patients and radiotherapy cannot be delivered in curative doses. Currently, tumor margins are typically assessed by the surgeon through visual assessment and palpation of the tumor intraoperatively. Resected tumor margin is then analyzed to ensure that margins are negative for tumor tissue, indicating that resection has been successful. On average, around 30% of tumors are assessed as margin-positive, indicating that there is a high chance that the tumor was not completely resected. In general, this assessment is followed by a follow-up operation or a more aggressive chemotherapy/radiation regimen. Enhancing the visualization of the tumor during surgical resection can dramatically impact both patients' health and the related health economic.

## Product

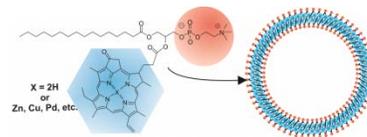
Porphysomes are a phototherapy agent, able to destroy diseased tissue by releasing heat due to their ability to absorb light in the near infrared region. The thermal expansion of the tissue during heating generates a photoacoustic signal which can then be converted to an image. Porphysomes can also be used as a drug delivery system—they can be directly labeled with radioisotopes to allow for real-time noninvasive imaging and tracking. Porphysomes are also fluorescent upon dissociation of the molecule and can be imaged optically to confirm the drug release. A physician can potentially inject drug-loaded porphysomes into a patient, confirm the arrival of the drug to the appropriate target, know exactly when the drug is released, and thus determine a drug's efficacy. All this is done with a simple and elegant molecular structure that is completely biocompatible and non-toxic.

## Competition

There are many nanoparticle companies. Synthetic polymers and/or metals form the basis for many of the existing nanoparticle technologies. However, porphysome is a first-in-class nanoparticle component of which has inherent imaging capabilities.

## Intellectual Property

Patents issued in US, Japan, and China. Patents are pending in EU and Canada.



### Company Profile:

URL:

<https://technainstitute.com/porphysomes/porphysomes/>

Industry: Therapeutics

### Contact:

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416-581-7726

### Financial Information:

Seeking seed capital: \$2-\$10M

### Management:

Seeking a dedicated experienced executive entrepreneur to advance the commercialization of this technology.

### Scientific Founder:

Dr. Gang Zheng

### Partners:

University Health Network

### Publication:

Jonathan F. Lovell, Cheng S. Jin, Elizabeth Huynh, Honglin Jin, Chulhong Kim, John L. Rubinstein, Warren C. W. Chan, Weiguo Cao, Lihong V. Wang, Gang Zheng, Nature Mat. 2011 (highlighted on Nat Methods. 2011 8:370-1)