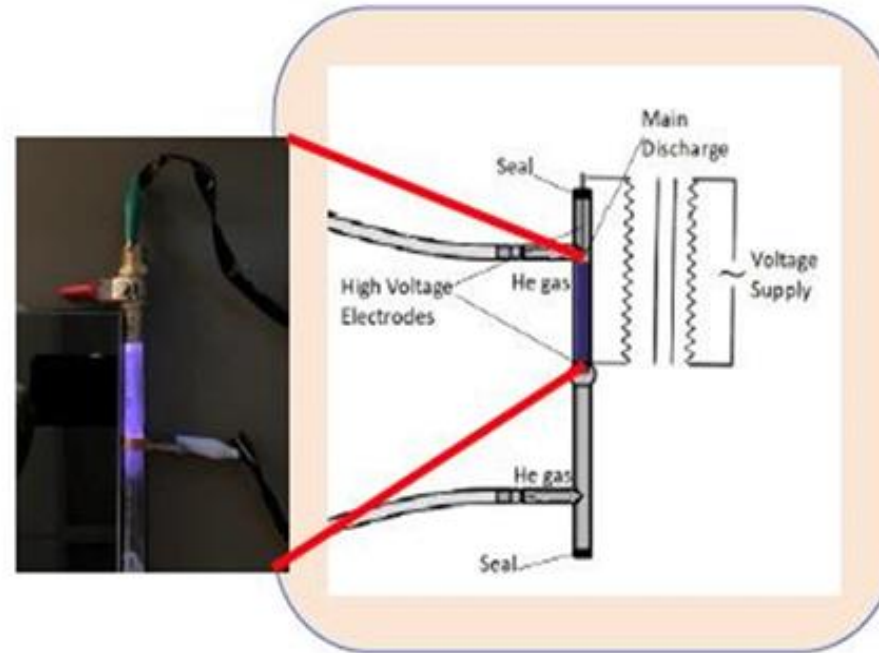


# Keidar PlasmaTech

Developed by The George Washington University

# Technology Summary

- ▶ Glioblastoma multiforme (GBM)
  - ▶ a highly invasive, aggressive brain tumor
  - ▶ Individuals with GBM face a poor prognosis, with few surviving past the 2-year mark
- ▶ Novel Plasma Discharge Tube (PDT) device
  - ▶ a new treatment option
  - ▶ non-invasive method
  - ▶ effective and less toxic
  - ▶ may be used alone or used to enhance the efficacy of drugs or radiation



Plasma Discharge Tube (PDT) is a cylindrical tube with ring electrodes. PDT generates electromagnetic emission to form radial plasma.

# Challenges with current therapies

- ▶ Current glioblastoma drugs, Rapamycin and Temozolomide (TMZ)
  - ▶ extend life for a matter of months
  - ▶ are not very effective in treating recurring tumors
  - ▶ have significant clinical toxicity
- ▶ Radiation
  - ▶ radiation alone leads to median survivals of approximately 1 year

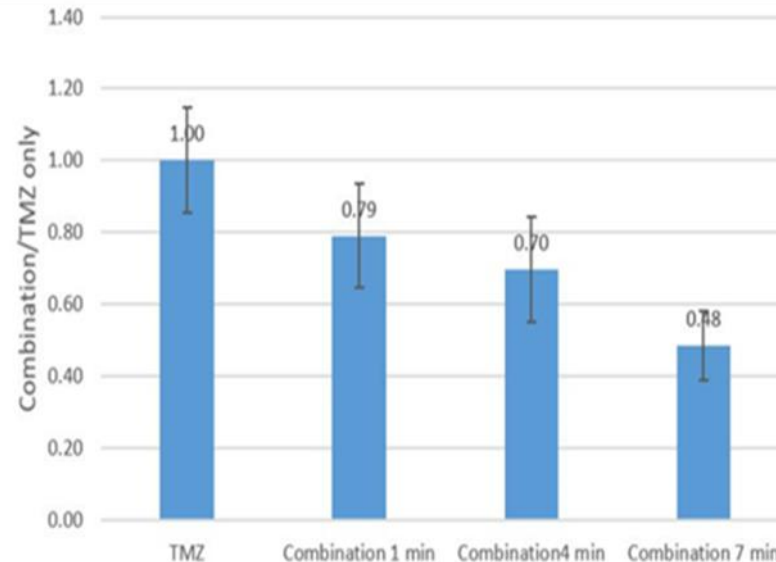
# Keidar's Solution

- ▶ Plasma Discharge Tube (PDT) device
  - ▶ PDT generates electromagnetic radiation (EM) to form Cold Atmospheric Plasma (CAP)
  - ▶ CAP is used to kill cancer cells, via a new type of cell death
- ▶ PDT used noninvasively Fig (A)
- ▶ PDT pretreatment significantly improves Temozolomide (TMZ) killing of cancer cells Fig (B)

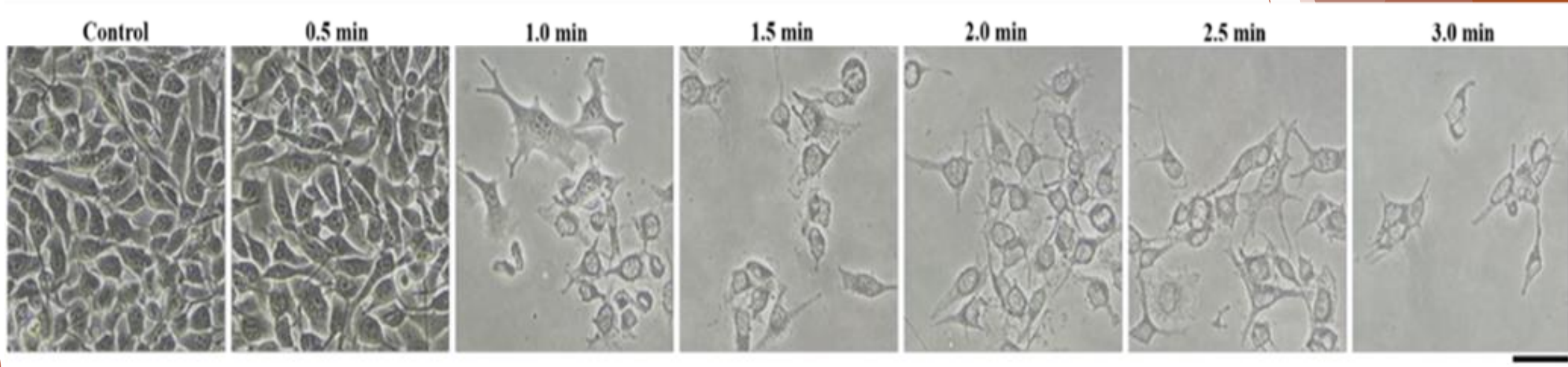
A



B



# The noninvasive CAP treatment causes new form of cell death via physical forces



Cancer cells were treated (0.5 - 3 min)  
with Physical CAP for two days

# How big is the market?

- ▶ The United States incidence rate for brain tumors in adults (20 years or older) is estimated to be 29.9 per 100,000 people
- ▶ Glioblastoma incidence rate is estimated to be 3.2 per 100,000 people

Age	5-year Survival
20-44	<b>22%</b>
45-54	<b>9%</b>
55-64	<b>6%</b>

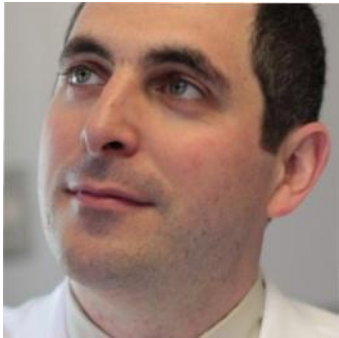
# Competition

- ▶ Temozolomide (TMZ) - side effects
  - ▶ Increased risk of infection
  - ▶ Loss of appetite
  - ▶ Tiredness
  - ▶ Seizures (fits)
  - ▶ Weakness on one side of the body
  - ▶ Skin rash
- ▶ RT (Radiation Therapy)
  - ▶ Stereotactic radiosurgery (SRS)
    - ▶ Gamma Knife
    - ▶ linear accelerator
  - ▶ Stereotactic body radiation therapy (SBRT)
  - ▶ Side Effects: skin problems

# The Team



- ▶ Michael Keidar
- ▶ Ph.D., Tel Aviv University, 1997
- ▶ A. James Clark Professor of Engineering
- ▶ Research Interest: micro propulsion and nanotechnologies



- ▶ Jonathan Sherman
- ▶ M.D., Medical College of Georgia at Augusta University 2003
- ▶ Associate Professor of Neurosurgery / Director of Surgical Neuro-oncology - Eastern Campus, West Virginia University
- ▶ Research Interest: treatment of cranial and spinal neuro-oncology patients



# The ASK

- ▶ What we are looking for:
  - ▶ Serial entrepreneur with potential for CEO role
  - ▶ Investment / Financing
- ▶ Is there a market for the newly developed Plasma Discharge Tube Therapy?
  - ▶ Yes, in glioblastoma and other cancers for which limited treatment options are available.
- ▶ How far from evaluation of the technology in patients?
  - ▶ We are working on validation in animal models and patients could receive PDT therapy within 1 Year.

# Closing

- ▶ Non-Invasive therapeutic device platform may work against multiple types of cancers.
- ▶ PDT device and methods protected by patent applications.
- ▶ Michael Keidar has experience in transferring his technologies to startup companies in the medical and aerospace fields. He has another therapeutic device already in human testing.