Low-dose Carbon Monoxide Treatment for Metastatic Cancers

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Low-Dose Carbon Monoxide for Treatment of Metastatic Cancers

**Background & Unmet Need**
- Cancer metastasis is responsible for 90% of cancer-related deaths
- Patients with localized cancer often have undetectable tumor cells in distant sites, which could later form metastatic tumors
- Therapies to prevent or treat metastatic tumors are limited, and conventional anti-proliferative chemotherapies often do not decrease metastasis
- **Unmet Need**: Methods to treat, prevent, alleviate cancer metastasis

**Technology Overview**
- **The Technology**: A method to treat or prevent metastatic cancer via administration of low-dose carbon monoxide separately or in combination with additional therapeutic agents
- By perturbing cancer cell metabolism, low-dose carbon monoxide (CO) treatment decreases metastatic potential in multiple cancer types including breast, colon, and prostate
- CO decreases cancer cell migration *in vitro* without affecting activity of non-malignant cells
- CO can be administered by gas inhalation, nanoparticle delivery, or other carbon-monoxide releasing molecules (CORMs)
- **PoC Data**: Pre-clinical testing via inhalation of low-dose CO reduced metastatic tumor burden completely in pancreatic ductal adenocarcinoma (PDAC) 8988T-bearing mice (p < 0.05) and by 50% in triple-negative breast cancer (TNBC) MBA-MB-231-bearing mice (p < 0.0001)

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**Patents:**
US Application Filed

**Publications:**

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**Cornell Reference:**
D-9146
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**Technology Applications**

- Neoadjuvant prophylactic treatment to prevent metastasis following a primary cancer diagnosis
- Adjuvant treatment to prevent metastasis or treat metastatic lesions
- Combination adjuvant treatment with additional therapeutic agents
- Treatment of idiopathic lung fibrosis

**Technology Advantages**

- Treatment is not cytotoxic and does not reduce activity of non-cancerous cells *in vitro*
- CO can be co-administered with current standard or care for a given cancer
- Effective against multiple cancers in reducing metastasis, metastatic burden, and tumor growth

**Supporting Data / Figures**

**Figure 1:** CO treatment in animal models reduces liver metastasis (a) and lung metastatic outgrowth (b) in PDAC (8988T) and TNBC (MDA-MB-231) *in vivo*

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**Figure 2:** Low-dose CO reduces transwell migration of ER+, HER2+, and triple negative breast cancer (BC) as well as pancreatic (PDAC), colon and prostate cancer *in vitro*

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