Stanford

Sharon Hori

Senior Research Scientist, Rad/Canary Center at Stanford for Cancer Early Detection

Professional

PROFESSIONAL INTERESTS

I utilize an integrative biological-mathematical-engineering approach to study the growth, development, early detection, and treatment of cancer. This includes:

1. The development of animal models of cancer, including subcutaneous and orthotopic xenograft cancer mouse models (primarily breast and ovarian cancer).
2. The detection of circulating biomarkers in blood and urine.
3. Molecular and anatomical imaging of cancer, including in vivo imaging modalities such as bioluminescence, fluorescence and ultrasound.
4. The development of mathematical models of cancer, with focus on parameter estimation and identifiability, hypothesis testing and discrimination, and nonlinear optimization.

Publications

PUBLICATIONS

- **A mathematical model of tumor regression and recurrence after therapeutic oncogene inactivation.** *Scientific reports*
  Hori, S. S., Tong, L. n., Swaminathan, S. n., Liebersbach, M. n., Wang, J. n., Gambhir, S. S., Felsher, D. W.
  2021; 11 (1): 1341
- **A Model-Based Personalized Cancer Screening Strategy for Detecting Early-Stage Tumors Using Blood-Borne Biomarkers** *CANCER RESEARCH*
  Hori, S. S., Lutz, A. M., Paulmurugan, R., Gambhir, S. S.
  2017; 77 (10): 2570-2584
- **Mathematical Model Identifies Blood Biomarker-Based Early Cancer Detection Strategies and Limitations** *SCIENCE TRANSLATIONAL MEDICINE*
  Hori, S. S., Gambhir, S. S.
  2011; 3 (109)
- **Dual-biomarkers encoding tumor-activatable minicircles with scaffold/matrix attachment region motif for sensitive and sustained blood and urine-based cancer detection.** *Cancer cell international*
  Chuang, H. Y., Lin, W. C., Kao, Y. J., Chiang, C. H., Chan, C. T., D'Souza, A. L., Gambhir, S. S., Hori, S. S.
  2026
- **Tumor volume doubling time estimated from digital breast tomosynthesis mammograms distinguishes invasive breast cancers from benign lesions.** *European radiology*
  Sadeghipour, N., Tseng, J., Anderson, K., Ayalasomayajula, S., Kozlov, A., Ikeda, D., DeMartini, W., Hori, S. S.
  2022

- **Engineering genetically-encoded synthetic biomarkers for breath-based cancer detection**
  Vermesh, O., D'Souza, A., Alam, I., Wardak, M., McLaughlin, T., El Rami, F., Sathirachinda, A., Bell, J., Pitteri, S., James, M., Hori, S., Gross, E., Gambhir, et al
  AMER ASSOC CANCER RESEARCH.2022

- **Compact Eight-Channel Light-Sensing System for Bioassays.** *Methods in molecular biology (Clifton, N.J.)*
  Kim, S., Hori, S. S., Sadeghipour, N., Sukumar, U. K., Paulmurugan, R.
  2022; 2525: 377-386

- **Minicircles for a two-step blood biomarker and PET imaging early cancer detection strategy.** *Journal of controlled release : official journal of the Controlled Release Society*
  Robinson, E. R., Gowrishankar, G., D'Souza, A., Kheirolomoom, A., Haywood, T., Hori, S. S., Chuang, H. Y., Zeng, Y., Tumbale, S., Aalipour, A., Beinat, C., Alam, I. S., Sathirachinda, et al
  2021

- **A mathematical model of ctDNA shedding predicts tumor detection size.** *Science advances*
  Avanzini, S., Kurtz, D. M., Chabon, J. J., Moding, E. J., Hori, S. S., Gambhir, S. S., Alizadeh, A. A., Diehn, M., Reiter, J. G.
  2020; 6 (50)

- **ctDNA shedding dynamics dictate early lung cancer detection potential**
  Avanzini, S., Kurtz, D. M., Chabon, J. J., Hori, S. S., Alizadeh, A. A., Diehn, M., Reiter, J. G.
  AMER ASSOC CANCER RESEARCH.2020: 25

- **Highly sensitive eight-channel light sensing system for biomedical applications.** *Photochemical & photobiological sciences : Official journal of the European Photochemistry Association and the European Society for Photobiology*
  Kim, S. B., Hori, S. S., Sadeghipour, N., Sukumar, U. K., Fujii, R., Massoud, T. F., Paulmurugan, R.
  2020

- **A blood biomarker for monitoring response to anti-EGFR therapy.** *Cancer biomarkers : section A of Disease markers*
  Hughes, N. P., Xu, L., Nielsen, C. H., Chang, E., Hori, S. S., Natarajan, A., Lee, S., Kjar, A., Kani, K., Wang, S. X., Mallick, P., Gambhir, S. S.
  2018

- **Engineering Intracellularly Retained Gaussia Luciferase Reporters for Improved Biosensing and Molecular Imaging Applications.** *ACS chemical biology*
  Gaur, S. n., Bhargava-Shah, A. n., Hori, S. n., Afjei, R. n., Sekar, T. V., Gambhir, S. S., Massoud, T. F., Paulmurugan, R. n.
  2017

- **On-Target Probes for Early Detection** *Nature Biomedical Engineering*
  Hori, S. S., Tummers, W. S., Gambhir, S. S.
  2017; 1: 1-3

- **Photoacoustic Tomography Detects Early Vessel Regression and Normalization During Ovarian Tumor Response to the Antiangiogenic Therapy Trebananib.** *Journal of nuclear medicine*
  Bohndiek, S. E., Sasportas, L. S., Machtaler, S., Jokerst, J. V., Hori, S., Gambhir, S. S.
  2015; 56 (12): 1942-1947

- **Development and Validation of an Immuno-PET Tracer as a Companion Diagnostic Agent for Antibody-Drug Conjugate Therapy to Target the CA6 Epitope.** *Radiology*
  Ilovich, O., Natarajan, A., Hori, S., Sathirachinda, A., Kimura, R., Srinivasan, A., Gebauer, M., Kruip, J., Focken, I., Lange, C., Carrez, C., Sassoon, I., Blanc, et al
  2015; 276 (1): 191-198

- **Detecting cancers through tumor-activatable minicircles that lead to a detectable blood biomarker.** *Proceedings of the National Academy of Sciences of the United States of America*
  Ronald, J. A., Chuang, H., Dragulescu-Andrasi, A., Hori, S. S., Gambhir, S. S.
  2015; 112 (10): 3068-3073

- **Detection and quantitation of circulating tumor cell dynamics by bioluminescence imaging in an orthotopic mammary carcinoma model.** *PloS one*
  Sasportas, L. S., Hori, S. S., Pratx, G., Gambhir, S. S.
  2014; 9 (9)

- **Role of endosomal trafficking dynamics on the regulation of hepatic insulin receptor activity: Models for fao cells** *ANNALS OF BIOMEDICAL ENGINEERING*
  Hori, S. S., Kurland, I. J., DiStefano, J. J.
  2006; 34 (5): 879-892