SOMPONNAT SAMPATTAVANICH, Ph.D.

Current Position

Assistant Professor, Department of Pharmacology, Faculty of Medicine Siriraj Hospital
Director, Siriraj Center of Research Excellence for Cancer Precision Medicine and Systems Pharmacology
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Education

2005-2011 **Massachusetts Institute of Technology/Harvard Medical School, Cambridge, MA, USA**
Ph.D. in Medical and Electrical Engineering
- Joint program between Harvard Medical School and MIT (HST MEMP Program)
- Engineering coursework at MIT and clinical curriculum at HMS

2005- 2007 **Massachusetts Institute of Technology, Cambridge, MA, USA**
S.M. in Electrical Engineering

2002-2005 **Johns Hopkins University, Baltimore, MD, USA**
B.S. in Biomedical Engineering
- Fully supported by the Thai King's Scholarship (awarded to top-five Thai high school students)
- Graduated in three years with the highest departmental honor (Richard J. Johns Award)

2001-2002 **Taft School, Watertown, CT, USA**
Post-graduate level

1999-2001 **Triam Udom Suksa School, Bangkok, Thailand**
Upper secondary school

Awards

Excellent Preclinical Research of the Year, Faculty of Medicine Siriraj Hospital (2024)
First poster prize award, Frontiers in Cancer Science, Singapore (2023)
Winner, Pacific Spatial Biology Research Grant Program, Nanostring (2020)
Academic Employee of the Year, Faculty of Medicine Siriraj Hospital (2019)
Excellent Preclinical Research of the Year, Faculty of Medicine Siriraj Hospital (2019)
First Runner-up, Newton Prize (2017)
Harvard-MIT Division of Health Sciences and Technology fellowship (2006)
Howard Hughes summer research fellowship, JHU (2004)
Merit award, James F. Lincoln Arc Welding Biomedical Design Competition (2003)
Silver medal, Thailand's National Biology Olympiad (2001)
First Prize, National Science Quiz Contest, Thailand (2000)
Tau Beta Pi, National Engineering Honor Society, member since 2004
Alpha Eta Mu Beta, National Biomedical Engineering Honor Society, member since 2004
Golden Key International Honor Society, member since 2003
National Society of Collegiate Scholars, member since 2002

Research and Professional Experiences

2014–Present Director, Siriraj Center of Research Excellence for Cancer Precision Medicine & Systems Pharmacology (SiCORE-PMSP), Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand

- Lead a translational precision oncology program integrating spatial biology, systems pharmacology, and functional drug profiling.
- Established and oversee platforms in multiplex tissue imaging, patient-derived organoids, RPPA, and high-content phenotypic imaging.
- Develop biomarker-driven strategies for cholangiocarcinoma and other solid tumors using spatial and single-cell approaches.
- Teach new drug development, systems biology, cancer biology, and genomics; initiated Systems Pharmacology curriculum.

2011–2014 Postdoctoral Fellow, Department of Systems Biology, Harvard Medical School, USA
Advisor: Peter K. Sorger, Ph.D.

- Investigated heterogeneity in cancer therapeutic responses.
- Developed dual FRET biosensors to quantify ERK and AKT pathway dynamics in single cells.
- Conducted high-throughput perturbation profiling of RTK signaling networks.

2005–2011 Graduate Research Assistant, Massachusetts Institute of Technology (MIT), USA
Advisor: Joel Voldman, Ph.D.

- Developed microfabricated platforms to study autocrine signaling and cancer cell growth.
- Engineered patterned cell arrays for quantitative analysis of signaling networks.

2002–2005 Undergraduate Researcher, Johns Hopkins University, USA,
Advisor: Jennifer H. Elisseeff, Ph.D.

- Studied 3D microenvironmental regulation of embryonic stem cell differentiation using hydrogel-based systems.

Research Profile

https://orcid.org/0000-0001-7783-6103 Scopus Author ID:14061051000
Total Publication in Scopus Index: 39, H-Index (Lifetime): 13, Total Citation: 720

Selected Publications

Peer-reviewed articles

1. Htwe KSS, Soontrapa K, Prasopporn S, Chusorn P, Okada S, Jirawatnotai S, **Sampattavanich S**, Wongkajornsilp A. Vorinostat restores iNKT cell functionality in aggressive cholangiocarcinoma. *Biomed Pharmacother.* 2025;186:117964.
2. Chia S, Wen Seow JJ, Peres da Silva R, Suphavilai C, Shirgaonkar N, Murata-Hori M, et al. **Sampattavanich S**, Tan IB, Nagarajan N, DasGupta R. CAN-Scan: A multi-omic phenotype-driven precision oncology platform identifies prognostic biomarkers of therapy response for colorectal cancer. *Cell Rep Med.* 2025;6(4):102053.
3. Jawwad T, Kamkaew M, Phongkitkarun K, Chusorn P, Jamnongsong S, Lam EW, **Sampattavanich S**. Exploring the single-cell dynamics of FOXM1 under cell cycle perturbations. *Cell Prolif.* 2025:e70019.
4. Phongkitkarun K, Chusorn P, Kamkaew M, Jamnongsong S, Lam E, Promptmas C, **Sampattavanich S**. A chemically tunable FOXM1–DHFR sensor reveals the direct influence of FOXM1 on the cell cycle. *J Cell Sci.* 2025;138(14):jcs263749.
5. Htut NW, Onkoksoong T, Saelim M, Kueanjinda P, **Sampattavanich S**, Panich U. Live-cell imaging unveils stimulus-specific dynamics of Nrf2 activation in UV-exposed melanoma cells: Implications for antioxidant compound screening. *Free Radic Biol Med.* 2024;211:1–11.

6. Khosla D, Misra S, Chu PL, Guan P, Nada R, Gupta R, et al. **Sampattavanich S**, Tan J, Kongpetch S, Jusakul A, Teh BT, Chan JY, Hong JH. Cholangiocarcinoma: Recent advances in molecular pathobiology and therapeutic approaches. *Cancers (Basel).* 2024;16(4):801.
7. Panaampon J, Sungwan P, Fujikawa S, **Sampattavanich S**, Jirawatnotai S, Okada S. Trastuzumab, a monoclonal anti-HER2 antibody, modulates cytotoxicity against cholangiocarcinoma via multiple mechanisms. *Int Immunopharmacol.* 2024;138:112612.
8. Thinyakul C, Sakamoto Y, Shimoda M, Liu Y, Thongchot S, Reda O, et al. **Sampattavanich S**, Thuwajit C, Moroishi T. Hippo pathway in cancer cells induces $NCAM1^{+}\alpha SMA^{+}$ fibroblasts to modulate tumor microenvironment. *Commun Biol.* 2024;7(1):1343.
9. Urumarudappa SKJ, Tran VNT, Oo HM, Suntiparpluacha M, **Sampattavanich S**, Rosa V, et al. Identifying potential immuno-oncology targets in salivary gland mucoepidermoid carcinoma based on inflammatory status and treatment response. *J Oral Pathol Med.* 2023;52(10):939–950.
10. Suntiparpluacha M, Chanthercrob J, Sa-Nguanraksa D, Sitthikornpaiboon J, Chaiboonchoe A, Kueanjinda P, Jinawath N, **Sampattavanich S**. Retrospective study of transcriptomic profiling identifies Thai triple-negative breast cancer patients who may benefit from immune checkpoint and PARP inhibitors. *PeerJ.* 2023;11:e15350.
11. Tanjak P, Chaiboonchoe A, Suwatthanarak T, Acharayothin O, Thanormjit K, Chanthercrob J, et al. **Sampattavanich S**, Korphaisarn K, Pongpaibul A, Poungvarin N, Grove H, Riansuwan W, Trakarnsanga A, Methasate A, Pithukpakorn M, Chinswangwatanakul V. The KRAS-mutant consensus molecular subtype 3 reveals an immunosuppressive tumor microenvironment in colorectal cancer. *Cancers (Basel).* 2023;15(4).
12. Pipatpanyanugoon N, Wareesawetsuwan N, Prasopporn S, Poolex W, Pisitkun T, Kaewkong W, **Sampattavanich S**, Jirawatnotai S. BAIAP2L1 enables cancer cell migration and facilitates phospho-cofilin asymmetry localization in the border cells. *Cancer Commun (Lond).* 2022;42(1):75–79.
13. Prasopporn S, Suppramote O, Ponvilawan B, Jamyuang C, Chanthercrob J, Chaiboonchoe A, et al. **Sampattavanich S**, Jirawatnotai S. Combining the SMAC mimetic LCL161 with gemcitabine plus cisplatin therapy inhibits and prevents the emergence of multidrug resistance in cholangiocarcinoma. *Front Oncol.* 2022;12:1021632.
14. Suppramote O, Prasopporn S, Aroonpruksakul S, Ponvilawan B, Makjaroen J, Suntiparpluacha M, Korphaisarn K, Charngkaew K, Chanwat R, Pisitkun R, Okada S, **Sampattavanich S**, Jirawatnotai S. The acquired vulnerability caused by CDK4/6 inhibition promotes drug synergism between oxaliplatin and palbociclib in cholangiocarcinoma. *Front Oncol.* 2022;12:877194.
15. Jamnongsong S, Kueanjinda P, Buraphat P, Sakornsakolpat P, Vaeteewoottacharn K, Okada S, Jirawatnotai S, **Sampattavanich S**. Comprehensive drug response profiling and pan-omic analysis identified therapeutic candidates and prognostic biomarkers for Asian cholangiocarcinoma. *iScience.* 2022;25(10):105182.
16. Jaru-Ampornpan P, Tansirisithikul C, Prukajorn M, **Sampattavanich S**, Pithukpakorn M. Germline ATM mutation and somatic PIK3CA and BCOR mutations found in an infant with aggressive orbital embryonal rhabdomyosarcoma. *Am J Ophthalmol Case Rep.* 2021;23:101189.
17. Somchai P, Phongkitkarun K, Kueanjinda P, Jamnongsong S, Vaeteewoottacharn K, Luvira V, Okada S, Jirawatnotai S, **Sampattavanich S**. Novel analytical platform for robust identification of cell migration inhibitors. *Sci Rep.* 2020;10(1):931.
18. Sittithumcharee G, Suppramote O, Vaeteewoottacharn K, Sirisuksakun C, Jamnongsong S, Laphanuwat P, et al. **Sampattavanich S**, Okada S, Jirawatnotai S. Dependency of cholangiocarcinoma on cyclin D-dependent kinase activity. *Hepatology.* 2019;70(5):1614–1630.
19. **Sampattavanich S**, Steiert B, Kramer B, Gyori B, Albeck J, Sorger P. Encoding growth factor identity in the temporal dynamics of FoxO3 under combinatorial regulation by ERK and Akt. *Cell Syst.* 2018;6(6):664–678.e9.
20. Laphanuwat P, Likasitwatanakul P, Thaphaengphan A, Chomanee N, Ketaroonrut N, Sittithumcharee G, Charngkaew K, Lam EW, Okada S, Panich U, **Sampattavanich S**, Jirawatnotai S. Cyclin D1 depletion interferes with oxidative balance and promotes cancer cell senescence. *J Cell Sci.* 2018;131(12):jcs214726.
21. Thanuthanakhun N, Nuntakarn L, **Sampattavanich S**, Anurathapan U, Phuphanitcharoenkun S, Pornpaiboonstid S, Borwornpinyo S, Hongeng S. Investigation of FoxO3 dynamics during erythroblast development in β-thalassemia major. *PLoS One.* 2017;12(11):e0187610.

22. Atwal S, Giengkamb S, Chaemchuenb S, Dorlingc J, VanNieuwenhzed M, Kosaisawe N, **Sampattavanich S**, Schumanne P, Salje J. Evidence for a peptidoglycan-like structure in *Orientia tsutsugamushi*. *Mol Microbiol.* 2017;105(3):440–452.
23. Jeayeng S, Wongkajornsilp A, Slominski AT, Jirawatnotai S, **Sampattavanich S**, Panich U. Nrf2 in keratinocytes modulates UVB-induced DNA damage and apoptosis in melanocytes through MAPK signaling. *Free Radic Biol Med.* 2017;113:91–102.
24. Chaiprasongsuk A, Lohakul J, Soontrapa K, **Sampattavanich S**, Akarasereenont P, Panich U. Activation of Nrf2 reduces UVA-mediated MMP-1 upregulation via MAPK/AP-1 signaling cascades: Photoprotective effects of sulforaphane and hispidulin. *J Pharmacol Exp Ther.* 2017;360(3):388–398.
25. Chaisiriwong C, Wanitphakdeedecha R, Sitthinamsuwan P, **Sampattavanich S**, Chatsiricharoenkul S, Manuskiatti W, Panich U. A case-control study of involvement of oxidative DNA damage and alteration of antioxidant defense system in patients with basal cell carcinoma: Modulation by tumor removal. *Oxid Med Cell Longev.* 2016;2016:5934024.
26. Hwang NS, Kim MS, **Sampattavanich S**, Baek JH, Zhang Z, Elisseeff J. Effects of three-dimensional culture and growth factors on the chondrogenic differentiation of murine embryonic stem cells. *Stem Cells.* 2006;24:284–291.

Patent

1. Gurewitsch ED, Ruffner M, Ching KH, **Sampattavanich S**, Ashkon S, Gillian YH(SG), Shangnung HE. "Devices, and methods for bioimpedance measurement of cervical tissue and methods for diagnosis and treatment of human cervix," International Application WO 04/098389 (JHU Ref 4241).

Research Support

As Principal Investigator

National & Governmental Grants

1. **Strategic Fund (HSRI, Thailand)**
   2019–2021 | 6.5 MBaht
   Development of Technology for Subtyping, Surveillance, and Prognosis of Thai Breast Cancer
   Focus: Advanced omics platform for triple-negative breast cancer (TNBC).
2. **Mid-Career Research Grant (NRCT, Thailand)**
   2022–2024 | 0.7365 MBaht
   Development of an Immunophenotyping Platform for Advanced Cancer Diagnostics Using Highly Multiplex Tissue Imaging
   Focus: Clinical multiplex spatial imaging for cancer diagnostics.
3. **Fundamental Fund (NRCT, Thailand)**
   2023–2024 | 6.171 MBaht
   Drug Resistance Mechanisms in Relapsed Multiple Myeloma via Tumor Microenvironment Interactions
   Focus: Stroma-induced resistance mechanisms.
4. **Translational Research Grant (PMU-C & Siriraj Vittayavijai Co., Ltd.)**
   2023–2026 | 15 MBaht
   Establishment of an Accredited Tumoroid Live Biobank from Thai Patients for Drug Response Prediction
   Focus: ISO-aligned PDO/tumoroid biobank for clinical drug response prediction.
5. **Mahidol University Strategic Research Fund (Rising Star Scheme)**
   2023–2025 | 1.5 MBaht
   Single-Cell Transcriptional Landscape of PARP Inhibitor–Induced Ovarian Cancer Dormancy

International & Independent Funding

1. **Siriraj Foundation – Cancer Precision Medicine Fund**
   2024–2026 | 1 MBaht
   Immune Checkpoint Inhibitor Super-Responders: Spatial and Tumor Microenvironment Mechanisms
2. **Siriraj Foundation – Advanced Sarcoma Research Fund**
   2023–2024 | 1 MBaht
   Spatial and Immunophenotypic Profiling of UPS and MFS
3. **British Council – TNE Exploratory Grant 2025**
   2026–2027 | 25,000 GBP
   Thai–UK Transnational Education Partnership in AI for Precision Drug Discovery
   Focus: Development of a new MSc curriculum integrating AI and precision medicine.
4. **Siriraj Cancer Foundation**
   2025–2027 | 1 MBaht
   Spatial Proteogenomic Signature of Radioiodine-Refractory Thyroid Cancer

As Co-Investigator

Health Systems Research Institute (HSRI / HRSI), Thailand

1. *Deciphering Neoadjuvant Chemotherapy Responses in Osteosarcoma through Immune Profiling*
   2024–2026 | 4 MBaht
   PI: Assoc. Prof. Chandhanarat Chandhanayingyong
   Role: Spatial biology and multiplex immunophenotyping lead
   Contribution: Development of high-dimensional immune profiling panels and spatial TME analysis comparing adolescent vs adult osteosarcoma.
2. *Comparative Multi-Omics Analysis of Tumor Microenvironment in Early-Onset vs Late-Onset Colorectal Cancer*
   2024–2026 | 6 MBaht
   PI: Assoc.Prof. Krittiya Korphaisarn
   Role: Spatial omics integration and biomarker development
   Contribution: Integration of multiplex imaging, spatial transcriptomics, and multi-omic data to identify immune determinants of therapeutic response in EOCRC.