



2024

# Taipei International Breast Cancer Symposium

台北國際乳癌研討會

## Speech Abstract

Topic:

### **Breast cancer biology for precision medicine**

Christos Sotiriou MD, PhD

Abstract

Over the past 20 years, translational research in breast cancer has undergone transformative advances, driven by technological innovations that have unveiled critical biological insights. This presentation will explore pivotal milestones and emerging frontiers in the field, emphasizing the journey from gene expression studies to the integration of artificial intelligence (AI) in breast cancer management.

The talk will begin with the pioneering role of gene expression signatures, such as Oncotype DX and MammaPrint, which have revolutionized treatment de-escalation strategies. These assays have enabled clinicians to tailor therapies more precisely, minimizing overtreatment and optimizing outcomes for breast cancer patients.

Then, it will focus on the elucidation of the mutation landscape in both early-stage and metastatic breast cancer. Comprehensive genomic profiling has deepened our understanding of tumor evolution, paving the way for the development of more personalized therapeutic approaches. This knowledge has facilitated the identification of actionable mutations and the design of targeted treatments, significantly improving patient prognosis.

The presentation will also highlight the crucial role of the tumor microenvironment (TME) in modulating responses to immunotherapy. Understanding the intricate interactions between tumor cells and their surrounding stroma has been essential in predicting and enhancing treatment efficacy. Studies on the TME have underscored its impact on tumor progression and immune evasion, informing the development of novel immunotherapeutic strategies.

Technological advancements, such as single-cell RNA sequencing, spatial transcriptomics, and mass spectrometry, have revolutionized the study of tumor architecture. These cutting-edge techniques allow for an unprecedented in-depth characterization of breast tumors, revealing the spatial organization and dynamic interactions between tumor and stromal cells. Insights gained from these technologies are crucial for understanding tumor heterogeneity and its implications for prognosis and therapy response.

Finally, the talk will address the burgeoning potential of AI in breast cancer management. AI technologies promise to enhance diagnostic accuracy, predict therapeutic responses, and personalize patient care through sophisticated data analysis and machine learning algorithms. The integration of AI in clinical practice holds the potential to revolutionize the management of breast cancer, offering new avenues for improving patient outcomes.