

National Comprehensive Cancer Network® (NCCN®) recommended biomarker testing for recurrent unresectable (local or regional) or stage IV (M1) disease¹



	Biomarkers	NGS	PCR	FISH/ISH	IHC	Germline sequencing
Biomarkers associated with FDA-approved therapies¹⁻³	<i>PIK3CA</i> activating mutations	☑	☑			
	<i>AKT1</i> activating mutation	☑	☑			
	<i>PTEN</i> alterations	☑	☑ [*]			
	<i>ESR1</i> mutation	☑	☑			
	<i>NTRK</i> fusion	☑	☑	☑		
	MSI-H/dMMR	☑	☑		☑	
	TMB-H	☑				
	<i>RET</i> -fusion	☑				
	PD-L1				☑	
	HER2 (HER2 IHC 1+ OR 2+/ISH negative)			☑	☑	
	Germline <i>BRCA1/2</i> mutation					☑
	Germline <i>PALB2</i>					☑
Emerging biomarkers¹	<i>HER2</i> activating mutations	☑	☑			
	Somatic <i>BRCA1/2</i> mutations	☑				
	<i>FGFR1-3</i> fusion/mutation	☑				

*NGS will be a more comprehensive approach to detecting all actionable *PTEN* deletions and rearrangements compared with PCR.

NCCN makes no warranties of any kind whatsoever regarding their content, use or application and disclaims any responsibility for their application or use in any way.

AKT1, serine/threonine protein kinase 1; **BRCA1/2**, Breast Cancer susceptibility gene 1/2; **dMMR**, mismatch repair deficient; **ESR1**, estrogen receptor alpha; **FDA**, US Food and Drug Administration; **FGFR1-3**, fibroblast growth factor receptor 1-3; **FISH**, fluorescent in-situ hybridization; **HER2**, human epidermal growth factor receptor 2; **IHC**, immunohistochemistry; **ISH**, in-situ hybridization; **MSI-H**, microsatellite instability-high; **NGS**, next-generation sequencing; **NTRK**, neurotrophic tyrosine receptor kinase; **PALB2**, partner and localizer of *BRCA2*; **PD-L1**, protein death-ligand 1; **PIK3CA**, phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha; **PTEN**, phosphatase and tensin homolog; **RET**, rearranged during transfection; **TMB-H**, tumor mutational burden-high.

¹. Referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Breast Cancer V.4.2025. © National Comprehensive Cancer Network, Inc. 2025. All rights reserved. Accessed April 23, 2025. To view the most recent and complete version of the guideline, go online to NCCN.org.

². Henry NL, Somerfield MR, Dayao Z, et al. *J Clin Oncol*. 2022;40(27):3205-3221. ³. Erber R, Hartmann A. *Breast Care (Basel)*. 2020;15(5):481-490.

This resource is intended for US health care professionals only.
©2025 AstraZeneca. All rights reserved. US-99843 Last Updated 4/25

