Test at diagnosis to uncover *Fibroblast Growth Factor Receptor (FGFR)* alterations in bladder cancer

Biomarker testing for *FGFR* alterations may help reveal targeted therapy options for patients with bladder cancer¹

The role of FGFR in healthy cells

There are four FGFRs with kinase activity²

FGFRs are transmembrane kinase proteins involved in signaling pathways that control cellular processes:²

- Proliferation
- Differentiation
- Migration
- Angiogenesis³



FGF/FGFR signaling is pivotal for organ development, metabolism, and tissue homeostasis, notably in key organs/ systems, such as:⁴

- Lung
- Brain
- Heart
- Urinary system
- Skeletal system

FGFR alterations in cancer

Oncogenic *FGFR* genetic (somatic) alterations promote tumorigenesis by increasing cell proliferation, survival, migration, invasion and angiogenesis³

Frequency of FGFR alterations in cancer⁵



FGFR alterations are detected in 5–10% of all cancers. Increased detection is observed in some types of cancer⁵

Common *FGFR* alterations include:^{*6}

- Gene amplification
- Mutations
- Fusions

FGFR1 and FGFR3 genes are altered more frequently than FGFR2 and FGFR4 genes in human cancers⁶

Precision Medicine in Bladder Cancer⁷

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Analysis of genetic information from patient with bladder cancer



Identification of actionable *FGFR* alterations and prognostic biomarkers

Match patient to targeted therapy

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The Pathology Journey

Three key steps to identifying genetic alterations





Strong collaboration between oncologists, urologists and pathologists is key for the timely and accurate diagnosis and management of patients with bladder cancer^{10,11}

FGFR Testing Centers[†]

Caris Life Sciences

Foundation Medicine

Labcorp/Integrated Oncology

Molecular Pathology

Strata Oncology

Neogenomics

Tempus

Therascreen FGFR Lab Finder



Test at diagnosis to identify FGFR alterations in bladder cancer Learn more about the importance

of testing at J&J Medical Connect

*Cancer may have more than one type of FGFR mutation. †Reference laboratories are not a comprehensive list; please check with your reference laboratory to see if they can run an FGFR test. 2L, second line; AKT, protein kinase B; DAG, diacylglycerol; DNA, deoxyribonucleic acid; FGF, fibroblast growth factor; FGFR, fibroblast growth factor receptor; FISH, fluorescence in situ hybridization; IP3, inositol triphosphate; MAPK, mitogen-activated protein kinase; MEK, mitogenactivated protein kinase kinase; NGS, next-generation sequencing; PCR, polymerase chain reaction; PI3K, phosphoinositide 3-kinase; PKC, protein kinase C; PLC, phospholipase C; RAF, rapidly accelerating fibrosarcoma; RAS, rat sarcoma; RNA, ribonucleic acid.

1. Sieker-Radtke A, et al. J Clin Oncol. 2020;38:5015. 2. Pacini L, et al. Cells. 2021;10(5):1154. 3. Ruan R, et al. Mol Cancer. 2023;22:60. 4. Xie Y, et al. Sig Transduct Target Ther. 2020;5:181. 5. Krook M, et al. Br J Cancer. 2021;124:880–892. 6. Sun Y, et al. Ann Transl Med. 2020;8(20):1290. 7. Mohanty E, et al. J Pers Med. 2023;13 (5):756. 8. De Las Casas L, et al. Am J Clin Pathol. 2021;155:781–792. 9. Saha S, et al. JENCI. 2022;34:8. 10. Mazzucchelli R, et al. Front Surg. 2021;8:754741. 11. Compérat E, et al. World J Urol. 2022;40:915-927.

FGFR pathway image adapted from Pacini et al. Cells. 2021;10(5):1154. Pathways have been simplified and three receptors added. Creative Commons License. CC-BY 4.0. Frequency of FGFR alterations in cancer image adapted from Krook M, et al. Br J Cancer. 2021;124:880-892. Creative Commons License, CC-BY 4.0.

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