

FACT SHEET

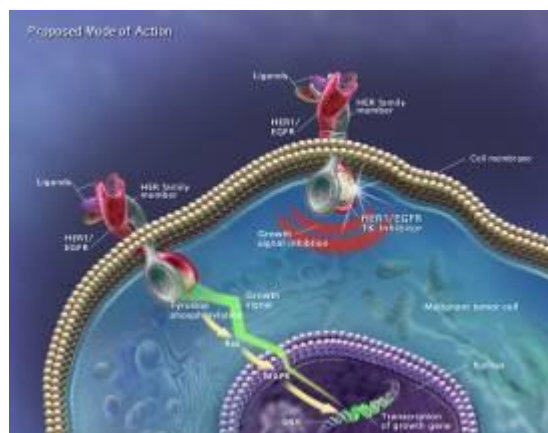
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Epidermal Growth Factor Receptor (EGFR)

The epidermal growth factor receptor (EGFR) is one of four receptors in the HER (human epidermal growth factor receptor) signaling pathway. The pathway consists of at least four cellular receptors: EGFR/HER1, HER2, HER3, and HER4. Approximately 11 different factors are known to bind and activate these receptors in certain patterns. The HER signaling pathway plays a role in the normal regulation of cell growth, proliferation, migration, and mediating processes, such as wound healing, tissue repair, and maintenance of the skin. In addition to its role in controlling the growth of normal cells, the HER signaling pathway has been shown to have a significant impact on the growth, proliferation, migration, and survival of cancer cells.

The Role of EGFR in Cancer

EGFR and other components of the HER signaling pathway interact in a complex and tightly regulated manner to regulate cell growth. Alterations in the amount or activity of HER family members may cause or support the inappropriate cell growth that leads to proliferation, migration, and survival of cancer cells. Because the signaling pathway works as a cascade that amplifies the growth signal at each step, small changes in the amount or activity of EGFR may significantly drive the development, or progression, of cancer by promoting cell growth and metastasis (cell migration) and inhibiting apoptosis (programmed cell death). Additionally, several studies have shown that HER signaling, an important regulator of normal cellular and tissue repair, is activated in response to a variety of cancer therapies that damage cells and tissues, including some chemotherapeutic agents and radiation¹⁻⁴. These studies suggest that activation of the HER pathway, including EGFR, may contribute to the development of treatment-resistant cancers.



For further information detailing the HER Pathway, a reporter guide is available at <http://www.gene.com/gene/news/kits/index.jsp>.

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2. Agus DB, Akita RW, Fox WD, *et al.*: A potential role for activated HER2 in prostate cancer. *Semin Oncol* 27:76-83; discussion 92-100, 2000.
3. Nicholson RI, Hutcheson IR, Harper ME, *et al.*: Modulation of epidermal growth factor receptor in endocrine-resistant, estrogen-receptor-positive breast cancer. *Ann N Y Acad Sci* 963:104-115, 2002.
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4. Liang K, Ang KK, Milas L, *et al.*: The epidermal growth factor receptor mediates radioresistance. *Int J Radiat Oncol Biol Phys* 57:246-254, 2003.