

## HER (ErbB) RECEPTORS AND CANCER FACT SHEET

### What are HER receptors?

- The HER or ErbB family of cellular receptors includes four growth factor receptors.<sup>1</sup>
  - EGFR or (HER1/ErbB1)
  - HER2 (ErbB2)
  - HER3 (ErbB3)
  - HER4 (ErbB4)
- HER1 and HER2 receptors play key roles in cell growth and survival.<sup>2</sup> As a result, the HER receptors might also play an important role in the development of cancer cells.<sup>3</sup>

### What is the relationship between HER2 receptors and cancer?

- Stimulation of HER2 is associated with cell proliferation and with multiple processes involved in tumor progression, invasion, and metastases (the spread of cancer throughout the body).<sup>1</sup>
- Abnormal cell signaling among these receptors can promote cancers to spread.<sup>1</sup>

### Are there differences between the receptors?

- Specifically, overexpression of HER2 has been reported in many types of cancer and is associated with poor prognosis<sup>4</sup> and reduced overall survival.<sup>5</sup>
- About 25% to 30% of breast cancers overexpress HER2 receptors.<sup>6</sup>

### Can HER receptors be targeted?

- Various strategies to target HER receptor pathways in cancer treatment are being evaluated in clinical trials.
- HER receptor inhibition is associated with decreased tumor cell division and regression of metastases.<sup>7</sup>
- Several agents that target one receptor have been approved for use in various cancers.

#### References

1. Holbro T, Civenni G, Hynes NE. "The ErbB receptors and their role in cancer progression." *Exp Cell Res* 2003; 284:99-110.
2. Normanno N, Bianco C, De Luca A, Maiello MR, Salomon, DS. "Target-based agents against ErbB receptors and their ligands: a novel approach to cancer treatment." *Endocrine-Related Cancer* 2003; 10:1-21.
3. Hynes, N, Lane H. "ErbB Receptors and Cancer: The Complexity of Targeted Inhibitors." *Nature Reviews Cancer* 2005; 5:341-354.
4. Olayioye, M. "Update on HER-2 as a target for cancer therapy Intracellular signaling pathways of ErbB2/HER-2 and family members." *Breast Cancer Res* 2001; 3:385-389.
5. Bianchi S, et al. "ErbB-receptors expression and survival in breast carcinoma: A 15-year follow-up study." *Journal of Cellular Physiology*. 2005; 206:702-708.
6. "Glossary." American Cancer Society. [http://www.cancer.org/docroot/gry/gry\\_0.asp?txtSearch=her2&dictionary=](http://www.cancer.org/docroot/gry/gry_0.asp?txtSearch=her2&dictionary=). Accessed May 7, 2008.
7. Hamid, O. "Emerging Treatments in Oncology: Focus on Tyrosine Kinase (erbB) Receptor Inhibitors." *J Am Pharm Assoc* 2004; 44(1):52-58.