7.61 FALL 2006 RECEPTORS & SIGNAL TRANSDUCTION PART 2

Background reading for Lectures 4, 5 and 6 (October 2, 16 and 23).

Please read these before class

These two lectures and the **associated discussion sections (October 17, 26 and November 2)** will cover various types of receptor signaling systems and pathways.

Alberts IV Chapter 15 - especially pages 871-900.

OR

Lodish et al VChapter 14

Some of this material has already been covered in the lectures on receptors and G proteins.

General

Current Opinion in Cell Biology – the second issue each year covers signaling

Hunter, T. (2000). Signaling – 2000 and beyond. Cell 100: 113-127

An excellent overview of the past, present and future of signal transduction.

Receptor Tyrosine Kinases

Schlessinger, J. (2000) Cell signalling by receptor tyrosine kinases. Cell 103: 211-225.
Reviews the evidence for receptor dimerization and activation and for recruitment of signaling molecules – excellent summary.

Schlessinger, J. (2002). Ligand-induced, receptor-mediated dimerization and activation of EGF receptor. Cell 110: 669-672.
Discusses the crystal structures of EGFR/EGF and EGFR/TGF-α and cites earlier work on the structures of other receptors receptors in complex with their ligands.

Cho, H.S., Mason, K., Ramyar, K.X., Stanley, A.M., Gabelli, S.B., Denney, D.W., Jr., and Leahy, D.J. (2003). Structure of the extracellular region of HER2 alone and in complex with the Herceptin Fab. Nature *421*, 756-760.

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Thomas, S.M. and Brugge, J.S. (1997) Cellular Functions Regulated by *src* Family Kinases. Annu. Rev. Cell Dev. Biol. 13: 513-609.

Heldin, C-H., Ostman, A. and Ronnstrand, L. (1998). Signal transduction via platelet-derived growth factor receptors. BBA Reviews on Cancer 1378: F79-F113.

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Kullander, K., and Klein, R. (2002). Mechanisms and functions of Eph and ephrin signalling. Nat Rev Mol Cell Biol *3*, 475-486.

Wells, A., and Marti, U. (2002). Signalling shortcuts: cell-surface receptors in the nucleus? Nat Rev Mol Cell Biol *3*, 697-702.

Carpenter, G. (2003). Nuclear localization and possible functions of receptor tyrosine kinases. Curr Opin Cell Biol *15*, 143-148.

Insulin Receptor and its Substrate

McKern et al. (2006) Structure of the insulin receptor ectodomain reveals a folded-over conformation. Nature 443: 218-221.

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Myers, M.G., Sun, X.J. and White, M.F. (1994). The IRS-1 signaling system. Trends Biol. Sci. 19:289-293.

Keller, S.R. and Lienhard, G.E. (1994). Insulin signalling: the role of insulin receptor substrate-1. Trends Cell Biol. 4:115-119.

Strålfors, P. (1997). Insulin second messengers. BioEssays 19:327-335.

B and T Cell Receptor Complexes

Qian, D. and Weiss, A. (1997). T cell antigen receptor signal transduction. Curr. Opin. Cell Biol. 9:205-212.

DeFranco, A. (1993). Structure and function of the B cell antigen receptor. Annu. Rev. Cell Biol. 9:377-410.

Crabtree, G.R. and Clipstone, N.A. (1994). Signal transmission between the plasma membrane and nucleus of T lymphocytes. Annu. Rev. Biochem. 63:1045-1083.

Cytokine Receptors and Signalling

Ozaki, K., and W.J. Leonard. 2002. Cytokine and cytokine receptor pleiotropy and redundancy. *J Biol Chem*. 277:29355-8.

O'Shea, J.J., M. Gadina, and R.D. Schreiber. 2002. Cytokine signaling in 2002: new surprises in the Jak/Stat pathway. *Cell*. 109 Suppl:S121-31.

Watowich et al. (1996). Cytokine receptor signal transduction and the control of hematopoeitic cell development. Annu. Rev. Cell Dev. Biol. 12:91-128.

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Ihle, J.N. (1995). Cytokine receptor signalling. Nature 377:591-594.

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TGFβ-Receptors and Signalling

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Alevizopoulos, A. and Mermod, N. (1997). Transforming growth factor-β: the breaking open of a black box. BioEssays 19:581-591.

Tyrosine Phosphatases

Hermiston et al. (2002) Reciprocal regulation of lymphocyte activation by tyrosine kinases and phosphatases. J. Clin. Invest. 109: 9-14.

Billadeau and Liebson (2002) ITAMs versus ITIMs: striking a balance during cell regulation. J. Clin. Invest. 109: 161-167..

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Receptor Downregulation

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PI3 Kinases

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PROTEIN-PROTEIN INTERACTION DOMAINS

SH2 and SH3 Domains

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PH Domains

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WW Domains

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WD Domains

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