LECTURE #1: **NUCLEOCYTOPLASMIC TRAFFICKING**

Assigned (Required) Reading is (1)-(4):

•General Background (in your Reader):

(1) Tran EJ, Wente SR (2006) Dynamic nuclear pore complexes: life on the edge. Cell 125: 1041-1053.

(2) Lange A, Mills RE, Lange CJ, Stewart M, Devine SE, Corbett AH (2007) Classical nuclear localization signals: definition, function, and interaction with importin-alpha. *J. Biol. Chem*. 282: 5101-5105.

(3) Cole CN, Scarcelli JJ (2006) Unravelling mRNA export. Nature Cell Biol. 8: 645-647.

•Paper for Friday Discussion Session (9 Nov.):

(4) Frey S, Görlich D (2007) A saturated FG-repeat hydrogel can reproduce the permeability properties of nuclear pore complexes. Cell 130: 512-523.

Nuclear Envelope and Nuclear Pore:

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Stavru F, Hulsmann BB, Spang A, Hartmann E, Cordes VC, Gorlich D (2006) NDC1: a crucial membrane-integral nucleoporin of metazoan nuclear pore complexes. J Cell Biol. 173: 509-519.

Hetzer MW, Walther TC, Mattaj IW (2005) Pushing the envelope: structure, function, and dynamics of the nuclear periphery. Annu. Rev. Cell Dev. Biol. 21: 347-380.

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Suntharalingam M, Wente SR (2003) Peering through the pore: nuclear pore complex structure, assembly, and function. Dev. Cell 4: 775-789.

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Vasu SK, Forbes DJ (2001) Nuclear pores and nuclear assembly. Curr. Opin. Cell Biol. 13: 363-375.

Stewart M, Baker RP, Bayliss R, Clayton L, Grant RP, Littlewood T, Matsuura Y (2001) Molecular mechanism of translocation through nuclear pore complexes during nuclear protein import. FEBS Lett. 498: 145-149.

Ribbeck K, Görlich D (2001) Kinetic analysis of translocation through nuclear pore complexes. EMBO J. 20: 1320-1330.

Rout, M.P., J.D. Aitchison, A. Suprapto, K. Hjertaas, Y. Zhao and B.T. Chait (2000) The yeast nuclear pore complex: composition, architecture, and transport mechanism. J. Cell Biol. 148: 635-651.

Wente, S.R. (2000) Gatekeepers of the nucleus. Science 288: 1374-1377.

Allen TD, Cronshaw JM, Bagley S, Kiseleva E, Goldberg MW (2000) The nuclear pore complex: mediator of translocation between nucleus and cytoplasm. J. Cell Sci. 113: 1651-1659.

Wilson KL (2000) The nuclear envelope, muscular dystrophy and gene expression. Trends Cell Biol 10: 125-129.

Signals for Nucleocytoplasmic Trafficking:

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Kau TR, Way JC, Silver PA (2004) Nuclear transport and cancer: from mechanism to intervention. Nature Rev. Cancer 4: 106-117.

Weis K (2003) Regulating access to the genome: nucleocytoplasmic transport throughout the cell cycle. Cell 112: 441-451.

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The Ran GTPase Cycle:

Seewald MJ, Kraemer A, Farkasovsky M, Korner C, Wittinghofer A, Vetter IR (2003) Biochemical characterization of the Ran-RanBP1-RanGAP system: are RanBP proteins and the acidic tail of RanGAP required for the Ran-RanGAP GTPase reaction? Mol. Cell. Biol. 23: 8124-8136.

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Overviews of the Biochemical Basis for Nucleocytoplasmic Transport:

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Strom AC, Weis K (2001) Importin-beta-like nuclear transport receptors. Genome Biol. 2: Revs. 3008.1-3008.9.

Export of Proteins and RNA from the Nucleus:

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Fasken MB, Corbett AH (2005) Process or perish: quality control in mRNA biogenesis. Nature Struct. Mol. Biol. 12: 482-488.

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Structural Analysis at Atomic Resolution of Nuclear Transport Factors:

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Regulation of Nucleocytoplasmic Trafficking by Protein Phosphorylation:

Schuller C, Ruis H (2002) Regulated nuclear transport. Results Probl Cell Differ. 35: 169-189.

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