

REFERENCES

- Adolfsson, J., O. J. Borge, et al. (2001). Upregulation of Flt3 expression within the bone marrow Lin(-)Sca1(+)c-kit(+) stem cell compartment is accompanied by loss of self-renewal capacity. *Immunity* 15(4): 659-69.
- Aplin, A. E., A. Howe, et al. (1998). Signal transduction and signal modulation by cell adhesion receptors: the role of integrins, cadherins, immunoglobulin-cell adhesion molecules, and selectins. *Pharmacol Rev* 50(2): 197-263.
- Arai, F., A. Hirao, et al. (2004). Tie2/angiopoietin-1 signaling regulates hematopoietic stem cell quiescence in the bone marrow niche. *Cell* 118(2): 149-61.
- Austin, T. W., G. P. Solar, et al. (1997). A role for the Wnt gene family in hematopoiesis: expansion of multilineage progenitor cells. *Blood* 89(10): 3624-35.
- Avecilla, S. T., K. Hattori, et al. (2004). Chemokine-mediated interaction of hematopoietic progenitors with the bone marrow vascular niche is required for thrombopoiesis. *Nat Med* 10(1): 64-71.
- Barbe, E., I. Huitinga, et al. (1996). A novel bone marrow frozen section assay for studying hematopoietic interactions in situ: the role of stromal bone marrow macrophages in erythroblast binding. *J Cell Sci* 109 (Pt 12): 2937-45.
- Baron, M. (2003). An overview of the Notch signalling pathway. *Semin Cell Dev Biol* 14(2): 113-9.
- Batlle, E., E. Sancho, et al. (2000). The transcription factor snail is a repressor of E-cadherin gene expression in epithelial tumour cells. *Nat Cell Biol* 2(2): 84-9.
- Bhatia, M., D. Bonnet, et al. (1999). Bone morphogenetic proteins regulate the developmental program of human hematopoietic stem cells. *J Exp Med* 189(7): 1139-48.
- Blank, U., G. Karlsson, et al. (2008). Signaling pathways governing stem-cell fate. *Blood* 111(2): 492-503.
- Calvi, L. M., G. B. Adams, et al. (2003). Osteoblastic cells regulate the haematopoietic stem cell niche. *Nature* 425(6960): 841-6.
- Canalis, E., A. N. Economides, et al. (2003). Bone morphogenetic proteins, their antagonists, and the skeleton. *Endocr Rev* 24(2): 218-35.

- Cao, X. and D. Chen (2005). The BMP signaling and in vivo bone formation. Gene 357(1): 1-8.
- Chen, D., M. Zhao, et al. (2004). Bone morphogenetic proteins. Growth Factors 22(4): 233-41.
- Chen, Y. T., D. B. Stewart, et al. (1999). Coupling assembly of the E-cadherin/beta-catenin complex to efficient endoplasmic reticulum exit and basal-lateral membrane targeting of E-cadherin in polarized MDCK cells. J Cell Biol 144(4): 687-99.
- Choi, K., M. Kennedy, et al. (1998). A common precursor for hematopoietic and endothelial cells. Development 125(4): 725-32.
- Coffman, R. L. and I. L. Weissman (1981). B220: a B cell-specific member of the T200 glycoprotein family. Nature 289(5799): 681-3.
- Comijn, J., G. Berx, et al. (2001). The two-handed E box binding zinc finger protein SIP1 downregulates E-cadherin and induces invasion. Mol Cell 7(6): 1267-78.
- Conacci-Sorrell, M., I. Simcha, et al. (2003). Autoregulation of E-cadherin expression by cadherin-cadherin interactions: the roles of beta-catenin signaling, Slug, and MAPK. J Cell Biol 163(4): 847-57.
- De Bari, C., F. Dell'Accio, et al. (2001). Human periosteum-derived cells maintain phenotypic stability and chondrogenic potential throughout expansion regardless of donor age. Arthritis Rheum 44(1): 85-95.
- Delaney, C., B. Varnum-Finney, et al. (2005). Dose-dependent effects of the Notch ligand Delta1 on ex vivo differentiation and in vivo marrow repopulating ability of cord blood cells. Blood 106(8): 2693-9.
- EI-Badri, N. S., B. Y. Wang, et al. (1998). Osteoblasts promote engraftment of allogeneic hematopoietic stem cells. Exp Hematol 26(2): 110-6.
- Essers, M. A., S. Offner, et al. (2009). IFN α activates dormant haematopoietic stem cells in vivo. Nature 458(7240): 904-8.
- Ferrari, S. L., K. Traianedes, et al. (2000). A role for N-cadherin in the development of the differentiated osteoblastic phenotype. J Bone Miner Res 15(2): 198-208.

- Fleming, H. E., V. Janzen, et al. (2008). Wnt signaling in the niche enforces hematopoietic stem cell quiescence and is necessary to preserve self-renewal in vivo. *Cell Stem Cell* 2(3): 274-83.
- Friedenstein, A. J., R. K. Chailakhjan, et al. (1970). The development of fibroblast colonies in monolayer cultures of guinea-pig bone marrow and spleen cells. *Cell Tissue Kinet* 3(4): 393-403.
- Goodell, M. A., K. Brose, et al. (1996). Isolation and functional properties of murine hematopoietic stem cells that are replicating in vivo. *J Exp Med* 183(4): 1797-806.
- Grotewold, L., T. Theil, et al. (1999). Expression pattern of Dkk-1 during mouse limb development. *Mech Dev* 89(1-2): 151-3.
- Grunwald, G. B., R. S. Pratt, et al. (1982). Enzymic dissection of embryonic cell adhesive mechanisms. III. Immunological identification of a component of the calcium-dependent adhesive system of embryonic chick neural retina cells. *J Cell Sci* 55: 69-83.
- Hatta, K., S. Takagi, et al. (1987). Spatial and temporal expression pattern of N-cadherin cell adhesion molecules correlated with morphogenetic processes of chicken embryos. *Dev Biol* 120(1): 215-27.
- Haug, J. S., X. C. He, et al. (2008). N-cadherin expression level distinguishes reserved versus primed states of hematopoietic stem cells. *Cell Stem Cell* 2(4): 367-79.
- Haynesworth, S. E., M. A. Baber, et al. (1996). Cytokine expression by human marrow-derived mesenchymal progenitor cells in vitro: effects of dexamethasone and IL-1 alpha. *J Cell Physiol* 166(3): 585-92.
- Hosokawa, K., F. Arai, et al. (2007). Function of oxidative stress in the regulation of hematopoietic stem cell-niche interaction. *Biochem Biophys Res Commun* 363(3): 578-83.
- Iscove, N. (1990). Haematopoiesis. Searching for stem cells. *Nature* 347(6289): 126-7.
- Iscove, N. N., H. Messner, et al. (1972). Human marrow cells forming colonies in culture: analysis by velocity sedimentation and suspension culture. *Ser Haematol* 5(2): 37-49.

- Jiang, Y., B. Vaessen, et al. (2002). Multipotent progenitor cells can be isolated from postnatal murine bone marrow, muscle, and brain. *Exp Hematol* 30(8): 896-904.
- Karanu, F. N., B. Murdoch, et al. (2000). The notch ligand jagged-1 represents a novel growth factor of human hematopoietic stem cells. *J Exp Med* 192(9): 1365-72.
- Karanu, F. N., B. Murdoch, et al. (2001). Human homologues of Delta-1 and Delta-4 function as mitogenic regulators of primitive human hematopoietic cells. *Blood* 97(7): 1960-7.
- Kiel, M. J., M. Acar, et al. (2009). Hematopoietic stem cells do not depend on N-cadherin to regulate their maintenance. *Cell Stem Cell* 4(2): 170-9.
- Kiel, M. J., S. He, et al. (2007). Haematopoietic stem cells do not asymmetrically segregate chromosomes or retain BrdU. *Nature* 449(7159): 238-42.
- Kiel, M. J. and S. J. Morrison (2008). Uncertainty in the niches that maintain haematopoietic stem cells. *Nat Rev Immunol* 8(4): 290-301.
- Kiel, M. J., G. L. Radice, et al. (2007). Lack of evidence that hematopoietic stem cells depend on N-cadherin-mediated adhesion to osteoblasts for their maintenance. *Cell Stem Cell* 1(2): 204-17.
- Kiel, M. J., O. H. Yilmaz, et al. (2005). SLAM family receptors distinguish hematopoietic stem and progenitor cells and reveal endothelial niches for stem cells. *Cell* 121(7): 1109-21.
- Kirstetter, P., K. Anderson, et al. (2006). Activation of the canonical Wnt pathway leads to loss of hematopoietic stem cell repopulation and multilineage differentiation block. *Nat Immunol* 7(10): 1048-56.
- Kopp, H. G., S. T. Avecilla, et al. (2005). The bone marrow vascular niche: home of HSC differentiation and mobilization. *Physiology (Bethesda)* 20: 349-56.
- Kunisato, A., S. Chiba, et al. (2003). HES-1 preserves purified hematopoietic stem cells ex vivo and accumulates side population cells in vivo. *Blood* 101(5): 1777-83.
- Lammert, E., O. Cleaver, et al. (2001). Induction of pancreatic differentiation by signals from blood vessels. *Science* 294(5542): 564-7.
- Li, L., L. A. Milner, et al. (1998). The human homolog of rat Jagged1 expressed by marrow stroma inhibits differentiation of 32D cells through interaction with Notch1. *Immunity* 8(1): 43-55.

- Li, W., S. A. Johnson, et al. (2003). Primary endothelial cells isolated from the yolk sac and para-aortic splanchnopleura support the expansion of adult marrow stem cells in vitro. *Blood* 102(13): 4345-53.
- MacDonald, B. T., M. Adamska, et al. (2004). Hypomorphic expression of Dkk1 in the doubleridge mouse: dose dependence and compensatory interactions with Lrp6. *Development* 131(11): 2543-52.
- Majumdar, M. K., M. A. Thiede, et al. (2000). Human marrow-derived mesenchymal stem cells (MSCs) express hematopoietic cytokines and support long-term hematopoiesis when differentiated toward stromal and osteogenic lineages. *J Hematother Stem Cell Res* 9(6): 841-8.
- Majumdar, M. K., M. A. Thiede, et al. (1998). Phenotypic and functional comparison of cultures of marrow-derived mesenchymal stem cells (MSCs) and stromal cells. *J Cell Physiol* 176(1): 57-66.
- Mancini, S. J., N. Mantei, et al. (2005). Jagged1-dependent Notch signaling is dispensable for hematopoietic stem cell self-renewal and differentiation. *Blood* 105(6): 2340-2.
- Morrison, S. J. and I. L. Weissman (1994). The long-term repopulating subset of hematopoietic stem cells is deterministic and isolatable by phenotype. *Immunity* 1(8): 661-73.
- Muller-Sieburg, C. E., C. A. Whitlock, et al. (1986). Isolation of two early B lymphocyte progenitors from mouse marrow: a committed pre-pre-B cell and a clonogenic Thy-1^{lo} hematopoietic stem cell. *Cell* 44(4): 653-62.
- Mumm, J. S. and R. Kopan (2000). Notch signaling: from the outside in. *Dev Biol* 228(2): 151-65.
- Noth, U., A. M. Osyczka, et al. (2002). Multilineage mesenchymal differentiation potential of human trabecular bone-derived cells. *J Orthop Res* 20(5): 1060-9.
- Ohishi, K., B. Varnum-Finney, et al. (2002). Delta-1 enhances marrow and thymus repopulating ability of human CD34(+)CD38(-) cord blood cells. *J Clin Invest* 110(8): 1165-74.

- Orsulic, S., O. Huber, et al. (1999). E-cadherin binding prevents beta-catenin nuclear localization and beta-catenin/LEF-1-mediated transactivation. J Cell Sci 112 (Pt 8): 1237-45.
- Osawa, M., K. Hanada, et al. (1996). Long-term lymphohematopoietic reconstitution by a single CD34-low/negative hematopoietic stem cell. Science 273(5272): 242-5.
- Peled, A., I. Petit, et al. (1999). Dependence of human stem cell engraftment and repopulation of NOD/SCID mice on CXCR4. Science 283(5403): 845-8.
- Pereira, R. M., A. M. Delany, et al. (2002). Cortisol regulates the expression of Notch in osteoblasts. J Cell Biochem 85(2): 252-8.
- Petit, I., M. Szyper-Kravitz, et al. (2002). G-CSF induces stem cell mobilization by decreasing bone marrow SDF-1 and up-regulating CXCR4. Nat Immunol 3(7): 687-94.
- Pittenger, M. F., A. M. Mackay, et al. (1999). Multilineage potential of adult human mesenchymal stem cells. Science 284(5411): 143-7.
- Puch, S., S. Armeanu, et al. (2001). N-cadherin is developmentally regulated and functionally involved in early hematopoietic cell differentiation. J Cell Sci 114(Pt 8): 1567-77.
- Radice, G. L., H. Rayburn, et al. (1997). Developmental defects in mouse embryos lacking N-cadherin. Dev Biol 181(1): 64-78.
- Radtke, F., A. Wilson, et al. (2004). Notch regulation of lymphocyte development and function. Nat Immunol 5(3): 247-53.
- Reya, T., A. W. Duncan, et al. (2003). A role for Wnt signalling in self-renewal of haematopoietic stem cells. Nature 423(6938): 409-14.
- Rogers, I. and R. F. Casper (2004). Umbilical cord blood stem cells. Best Pract Res Clin Obstet Gynaecol 18(6): 893-908.
- Ryan, D. H. (1993). Adherence of normal and neoplastic human B cell precursors to the bone marrow microenvironment. Blood Cells 19(2): 225-41; discussion 241-4.
- Sadot, E., I. Simcha, et al. (1998). Inhibition of beta-catenin-mediated transactivation by cadherin derivatives. Proc Natl Acad Sci U S A 95(26): 15339-44.

- Sato, T., N. Onai, et al. (2009). Interferon regulatory factor-2 protects quiescent hematopoietic stem cells from type I interferon-dependent exhaustion. *Nat Med* 15(6): 696-700.
- Scheller, M., J. Huelsken, et al. (2006). Hematopoietic stem cell and multilineage defects generated by constitutive beta-catenin activation. *Nat Immunol* 7(10): 1037-47.
- Schofield, R. (1978). The relationship between the spleen colony-forming cell and the haemopoietic stem cell. *Blood Cells* 4(1-2): 7-25.
- Shen, Q., S. K. Goderie, et al. (2004). Endothelial cells stimulate self-renewal and expand neurogenesis of neural stem cells. *Science* 304(5675): 1338-40.
- Shiozawa, Y., H. Takenouchi, et al. (2008). Human osteoblasts support hematopoietic cell development in vitro. *Acta Haematol* 120(3): 134-45.
- Steinberg, M. S. and P. M. McNutt (1999). Cadherins and their connections: adhesion junctions have broader functions. *Curr Opin Cell Biol* 11(5): 554-60.
- Stier, S., T. Cheng, et al. (2002). Notch1 activation increases hematopoietic stem cell self-renewal in vivo and favors lymphoid over myeloid lineage outcome. *Blood* 99(7): 2369-78.
- Suda, T. and F. Arai (2008). Wnt signaling in the niche. *Cell* 132(5): 729-30.
- Sutherland, H. J., C. J. Eaves, et al. (1989). Characterization and partial purification of human marrow cells capable of initiating long-term hematopoiesis in vitro. *Blood* 74(5): 1563-70.
- Sutherland, H. J., P. M. Lansdorp, et al. (1990). Functional characterization of individual human hematopoietic stem cells cultured at limiting dilution on supportive marrow stromal layers. *Proc Natl Acad Sci U S A* 87(9): 3584-8.
- Suyama, K., I. Shapiro, et al. (2002). A signaling pathway leading to metastasis is controlled by N-cadherin and the FGF receptor. *Cancer Cell* 2(4): 301-14.
- Taichman, R. S. and S. G. Emerson (1994). Human osteoblasts support hematopoiesis through the production of granulocyte colony-stimulating factor. *J Exp Med* 179(5): 1677-82.
- Taichman, R. S. and S. G. Emerson (1998). The role of osteoblasts in the hematopoietic microenvironment. *Stem Cells* 16(1): 7-15.

- Taichman, R. S., M. J. Reilly, et al. (1996). Human osteoblasts support human hematopoietic progenitor cells in vitro bone marrow cultures. *Blood* 87(2): 518-24.
- Takeichi, M. (1988). The cadherins: cell-cell adhesion molecules controlling animal morphogenesis. *Development* 102(4): 639-55.
- Till, J. E. and C. E. Mc (1961). A direct measurement of the radiation sensitivity of normal mouse bone marrow cells. *Radiat Res* 14: 213-22.
- Toma, J. G., M. Akhavan, et al. (2001). Isolation of multipotent adult stem cells from the dermis of mammalian skin. *Nat Cell Biol* 3(9): 778-84.
- Van Den Berg, D. J., A. K. Sharma, et al. (1998). Role of members of the Wnt gene family in human hematopoiesis. *Blood* 92(9): 3189-202.
- Van Scoyk, M., J. Randall, et al. (2008). Wnt signaling pathway and lung disease. *Transl Res* 151(4): 175-80.
- Varnum-Finney, B., C. Brasheen-Stein, et al. (2003). Combined effects of Notch signaling and cytokines induce a multiple log increase in precursors with lymphoid and myeloid reconstituting ability. *Blood* 101(5): 1784-9.
- Vas, V., L. Szilagyi, et al. (2004). Soluble Jagged-1 is able to inhibit the function of its multivalent form to induce hematopoietic stem cell self-renewal in a surrogate in vitro assay. *J Leukoc Biol* 75(4): 714-20.
- Visnjic, D., Z. Kalajzic, et al. (2004). Hematopoiesis is severely altered in mice with an induced osteoblast deficiency. *Blood* 103(9): 3258-64.
- Volk, T. and B. Geiger (1984). A 135-kd membrane protein of intercellular adherens junctions. *EMBO J* 3(10): 2249-60.
- Whitlock, C. A. and O. N. Witte (1982). Long-term culture of B lymphocytes and their precursors from murine bone marrow. *Proc Natl Acad Sci U S A* 79(11): 3608-12.
- Widelitz, R. (2005). Wnt signaling through canonical and non-canonical pathways: recent progress. *Growth Factors* 23(2): 111-6.
- Willert, K., M. Brink, et al. (1997). Casein kinase 2 associates with and phosphorylates dishevelled. *EMBO J* 16(11): 3089-96.
- Willert, K., J. D. Brown, et al. (2003). Wnt proteins are lipid-modified and can act as stem cell growth factors. *Nature* 423(6938): 448-52.

- Williams, E. J., G. Williams, et al. (2001). Identification of an N-cadherin motif that can interact with the fibroblast growth factor receptor and is required for axonal growth. *J Biol Chem* 276(47): 43879-86.
- Wilson, A., M. J. Murphy, et al. (2004). c-Myc controls the balance between hematopoietic stem cell self-renewal and differentiation. *Genes Dev* 18(22): 2747-63.
- Wilson, A. and A. Trumpp (2006). Bone-marrow haematopoietic-stem-cell niches. *Nat Rev Immunol* 6(2): 93-106.
- Xie, Y., T. Yin, et al. (2009). Detection of functional haematopoietic stem cell niche using real-time imaging. *Nature* 457(7225): 97-101.
- Zhang, J. and L. Li (2008). Stem cell niche: microenvironment and beyond. *J Biol Chem* 283(15): 9499-503.
- Zhang, J., C. Niu, et al. (2003). Identification of the haematopoietic stem cell niche and control of the niche size. *Nature* 425(6960): 836-41.
- Zimmerman, L. B., J. M. De Jesus-Escobar, et al. (1996). The Spemann organizer signal noggin binds and inactivates bone morphogenetic protein 4. *Cell* 86(4): 599-606.
- Zvaifler, N. J., L. Marinova-Mutafchieva, et al. (2000). Mesenchymal precursor cells in the blood of normal individuals. *Arthritis Res* 2(6): 477-88.

BIOGRAPHY



Author's Name Miss Praewphan Ingrungruanglert

Birthday 8 August 1984

Home Address 577 Soi Intamara 41, Sutisan Road, Dindeang, Bangkok
10310

E-mail numtip_in@hotmail.com

Education 2003-2006 Silpakorn University, Nakornpathom, Thailand

