

- [37] Seroby N, Schraufstatter IU, Strongin A, Khaldoyanidi SK. Nicotinic acetylcholine receptor-mediated stimulation of endothelial cells results in the arrest of haematopoietic progenitor cells on endothelium. *Br J Haematol* 2005; 129: 257-65.
- [38] Khaldoyanidi S, Sikora L, Orlovskaya I, *et al.* Correlation between nicotine-induced inhibition of hematopoiesis and decreased CD44 expression on bone marrow stromal cells. *Blood* 2001; 98: 303-12.
- [39] Pandit TS, Sikora L, Muralidhar G, Rao SP, Sriramarao P. Sustained exposure to nicotine leads to extramedullary hematopoiesis in the spleen. *Stem Cells* 2006; 24:2373-81.
- [40] Salem HK, Thiemermann C. Mesenchymal stromal cells: current understanding and clinical status. *Stem Cells* 2010; 28: 585-96.
- [41] Hoogduijn MJ, Cheng A, Genever PG. Functional nicotinic and muscarinic receptors on mesenchymal stem cells. *Stem Cells Dev* 2009; 18: 103-12.
- [42] Schraufstatter IU, DiScipio RG, Khaldoyanidi SK. Alpha 7 subunit of nAChR regulates migration of human mesenchymal stem cells. *J Stem Cells* 2009; 4: 203-15.
- [43] Zhao C, Deng W, Gage FH. Mechanisms and functional implications of adult neurogenesis. *Cell* 2008; 132: 645-60.
- [44] Reynolds BA, Weiss S. Generation of neurons and astrocytes from isolated cells of the adult mammalian central nervous system. *Science* 1992; 255: 1707-10.
- [45] Trujillo CA, Schwandt TT, Martins AH, *et al.* Novel perspectives of neural stem cell differentiation: from neurotransmitters to therapeutics. *Cytometry A* 2009; 75: 38-53.
- [46] Taly A, Corringier PJ, Guedin D, Lestage P, Changeux JP. Nicotinic receptors: allosteric transitions and therapeutic targets in the nervous system. *Nat Rev Drug Discov* 2009; 8: 733-50.
- [47] Atluri P, Fleck MW, Shen Q, *et al.* Functional nicotinic acetylcholine receptor expression in stem and progenitor cells of the early embryonic mouse cerebral cortex. *Dev Biol* 2001; 240: 143-56.
- [48] Diamandis P, Wildenhain J, Clarke ID, *et al.* Chemical genetics reveals a complex functional ground state of neural stem cells. *Nat Chem Biol* 2007; 3: 268-73.
- [49] Zhou C, Wen ZX, Shi DM, Xie ZP. Muscarinic acetylcholine receptors involved in the regulation of neural stem cell proliferation and differentiation in vitro. *Cell Biol Int* 2004; 28: 63-7.
- [50] Arous DN, Adriani W, Montaron MF, *et al.* Nicotine self-administration impairs hippocampal plasticity. *J Neurosci* 2002; 22: 3656-62.
- [51] Berger F, Gage FH, Vijayaraghavan S. Nicotinic receptor-induced apoptotic cell death of hippocampal progenitor cells. *J Neurosci* 1998; 18: 6871-81.
- [52] Koike K, Hashimoto K, Okamura N, *et al.* Decreased cell proliferation in the dentate gyrus of alpha 7 nicotinic acetylcholine receptor heterozygous mice. *Prog Neuropsychopharmacol Biol Psychiatry* 2004; 28: 517-20.
- [53] Kaneko N, Okano H, Sawamoto K. Role of the cholinergic system in regulating survival of newborn neurons in the adult mouse dentate gyrus and olfactory bulb. *Genes Cells* 2006; 11: 1145-59.
- [54] Mudo G, Belluardo N, Mauro A, Fuxe K. Acute intermittent nicotine treatment induces fibroblast growth factor-2 in the subventricular zone of the adult rat brain and enhances neuronal precursor cell proliferation. *Neuroscience* 2007; 145: 470-83.
- [55] Singh SK, Hawkins C, Clarke ID, *et al.* Identification of human brain tumour initiating cells. *Nature* 2004; 432: 396-401.
- [56] Ginestier C, Hur MH, Charafe-Jauffret E, *et al.* ALDH1 is a marker of normal and malignant human mammary stem cells and a predictor of poor clinical outcome. *Cell Stem Cell* 2007; 1: 555-67.
- [57] Jiang F, Qiu Q, Khanna A, *et al.* Aldehyde dehydrogenase 1 is a tumor stem cell-associated marker in lung cancer. *Mol Cancer Res* 2009; 7: 330-8.
- [58] Marcato P, Dean CA, Pan D, *et al.* Aldehyde dehydrogenase activity of breast cancer stem cells is primarily due to isoform ALDH1A3 and its expression is predictive of metastasis. *Stem Cells* 2011; 29: 32-45.
- [59] Charafe-Jauffret E, Ginestier C, Iovino F, *et al.* Breast cancer cell lines contain functional cancer stem cells with metastatic capacity and a distinct molecular signature. *Cancer Res* 2009; 69: 1302-13.
- [60] Tanei T, Morimoto K, Shimazu K, *et al.* Association of breast cancer stem cells identified by aldehyde dehydrogenase 1 expression with resistance to sequential Paclitaxel and epirubicin-based chemotherapy for breast cancers. *Clin Cancer Res* 2009; 15: 4234-41.
- [61] Dontu G, Abdallah WM, Foley JM, *et al.* In vitro propagation and transcriptional profiling of human mammary stem/progenitor cells. *Genes Dev* 2003; 17: 1253-70.
- [62] Merchant AA, Matsui W. Targeting Hedgehog—a cancer stem cell pathway. *Clin Cancer Res* 2010; 16: 3130-40.
- [63] Pannuti A, Foreman K, Rizzo P, *et al.* Targeting Notch to target cancer stem cells. *Clin Cancer Res* 2010; 16: 3141-52.
- [64] Takahashi-Yanaga F, Kahn M. Targeting Wnt signaling: can we safely eradicate cancer stem cells? *Clin Cancer Res* 2010; 16: 3153-62.
- [65] Hu C, Dievart A, Lupien M, *et al.* Overexpression of activated murine Notch1 and Notch3 in transgenic mice blocks mammary gland development and induces mammary tumors. *Am J Pathol* 2006; 168: 973-90.
- [66] Stylianou S, Clarke RB, Brennan K. Aberrant activation of notch signaling in human breast cancer. *Cancer Res* 2006; 66: 1517-25.
- [67] Reedijk M, Odorcic S, Chang L, *et al.* High-level coexpression of JAG1 and NOTCH1 is observed in human breast cancer and is associated with poor overall survival. *Cancer Res* 2005; 65: 8530-7.
- [68] Russo P, Catassi A, Cesario A, Servent D. Development of novel therapeutic strategies for lung cancer: targeting the cholinergic system. *Curr Med Chem* 2006; 13: 3493-512.
- [69] Johnson KC. Accumulating evidence on passive and active smoking and breast cancer risk. *Int J Cancer* 2005; 117: 619-28.
- [70] Nagata C, Mizoue T, Tanaka K, *et al.* Tobacco smoking and breast cancer risk: an evaluation based on a systematic review of epidemiological evidence among the Japanese population. *Jpn J Clin Oncol* 2006; 36: 387-94.
- [71] Murin S, Inciardi J. Cigarette smoking and the risk of pulmonary metastasis from breast cancer. *Chest* 2001; 119: 1635-40.
- [72] Murin S, Pinkerton KE, Hubbard NE, Erickson K. The effect of cigarette smoke exposure on pulmonary metastatic disease in a murine model of metastatic breast cancer. *Chest* 2004; 125: 1467-71.
- [73] Zhou Y, Gu X, Ashayeri E, Zhang R, Sridhar R. Nicotine decreases the cytotoxicity of doxorubicin towards MCF-7 and KB-3.1 human cancer cells in culture. *J Natl Med Assoc* 2007; 99: 319-27.
- [74] Guo J, Ibaragi S, Zhu T, *et al.* Nicotine promotes mammary tumor migration via a signaling cascade involving protein kinase C and CDC42. *Cancer Res* 2008; 68: 8473-81.
- [75] Dasgupta P, Rizwani W, Pillai S, *et al.* Nicotine induces cell proliferation, invasion and epithelial-mesenchymal transition in a variety of human cancer cell lines. *Int J Cancer* 2009; 124: 36-45.
- [76] Hirata N, Sekino Y, Kanda Y. Nicotine increases cancer stem cell population in MCF-7 cells. *Biochem Biophys Res Commun* 2010; 403: 138-43.
- [77] Kohutek ZA, diPierro CG, Redpath GT, Hussaini IM. ADAM-10-mediated N-cadherin cleavage is protein kinase C-alpha dependent and promotes glioblastoma cell migration. *J Neurosci* 2009; 29: 4605-15.
- [78] Mani SA, Guo W, Liao MJ, *et al.* The epithelial-mesenchymal transition generates cells with properties of stem cells. *Cell* 2008; 133: 704-15.
- [79] Korkaya H, Paulson A, Charafe-Jauffret E, *et al.* Regulation of mammary stem/progenitor cells by PTEN/Akt/beta-catenin signaling. *PLoS Biol* 2009; 7: e1000121.
- [80] Zhou J, Wulfkuehle J, Zhang H, *et al.* Activation of the PTEN/mTOR/STAT3 pathway in breast cancer stem-like cells is required for viability and maintenance. *Proc Natl Acad Sci USA* 2007; 104: 16158-63.
- [81] Lee CH, Huang CS, Chen CS, *et al.* Overexpression and activation of the alpha9-nicotinic receptor during tumorigenesis in human breast epithelial cells. *J Natl Cancer Inst* 2010; 102: 1322-35.
- [82] Sullivan JP, Spinola M, Dodge M, *et al.* Aldehyde dehydrogenase activity selects for lung adenocarcinoma stem cells dependent on notch signaling. *Cancer Res* 2010; 70: 9937-48.

- [83] Grozio A, Paleari L, Catassi A, *et al.* Natural agents targeting the alpha7-nicotinic-receptor in NSCLC: a promising prospective in anti-cancer drug development. *Int J Cancer* 2008; 122: 1911-5.
- [84] Catassi A, Paleari L, Servent D, *et al.* Targeting alpha7-nicotinic receptor for the treatment of pleural mesothelioma. *Eur J Cancer* 2008; 44: 2296-311.

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