

University of Groningen

Regeneration of irradiated salivary glands by stem cell therapy

Lombaert, Isabelle Madeleine Armand

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2008

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Lombaert, I. M. A. (2008). *Regeneration of irradiated salivary glands by stem cell therapy*. s.n.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

REFERENCES



1. JEMAL, A., Siegel, R., Ward, E. *et al.* Cancer statistics, 2006. **CA CANCER J. CLIN.** 56 [2], 106-130 (2006), and PARKIN, D., Bray, F., Ferlay, J. *et al.* Global cancer statistics, 2002. **CA CANCER J. CLIN.** 55, 74-108 (2005).
2. FEBER, T. Head and neck oncology nursing. Whurr Publishers Ltd., London. (2000).
3. VISSINK, A., Jansma, J., Spijkervet, F.K. *et al.* Oral sequelae of head and neck radiotherapy. **CRIT REV. ORAL BIOL. MED.** 14 [3], 199-212 (2003).
4. VISSINK, A., Burlage, F.R., Spijkervet, F.K. *et al.* Prevention and treatment of the consequences of head and neck radiotherapy. **CRIT REV. ORAL BIOL. MED.** 14 [3], 213-225 (2003).
5. COOPER, J.S., Fu, K., Marks, J. *et al.* Late effects of radiation therapy in the head and neck region. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 31 [5], 1141-1164 (1995).
6. REGELINK, G., Vissink, A., Reintsema, H. *et al.* Efficacy of a synthetic polymer saliva substitute in reducing oral complaints of patients suffering from irradiation-induced xerostomia. **QUINTESSENCE. INT.** 29 [6], 383-388 (1998).
7. MOSQUEDA-TAYLOR, A., Luna-Ortiz, K., Irigoyen-Camacho, M.E. *et al.* Effect of pilocarpine hydrochloride on salivary production in previously irradiated head and neck cancer patients. **MED. ORAL** 9 [3], 204-211 (2004).
8. JOHNSON, J.T., Ferretti, G.A., Nethery, W.J. *et al.* Oral pilocarpine for post-irradiation xerostomia in patients with head and neck cancer. **N. ENGL. J. MED.** 329 [6], 390-395 (1993).
9. TAYLOR, S.E. and Miller, E.G. Preemptive pharmacologic intervention in radiation-induced salivary dysfunction. **PROC. SOC. EXP. BIOL. MED.** 221 [1], 14-26 (1999).
10. BRAAM, P.M., Terhaard, C.H., Roesink, J.M. *et al.* Intensity-modulated radiotherapy significantly reduces xerostomia compared with conventional radiotherapy. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 66 [4], 975-980 (2006).
11. DIRIX, P., Nuyts, S., and Van den Bogaert, B.W. Radiation-induced xerostomia in patients with head and neck cancer: a literature review. **CANCER** 107 [11], 2525-2534 (2006).
12. VEERASARN, V., Phromratanapongse, P., Suntornpong, N. *et al.* Effect of Amifostine to prevent radiotherapy-induced acute and late toxicity in head and neck cancer patients who had normal or mild impaired salivary gland function. **J. MED. ASSOC. THAI.** 89 [12], 2056-2067 (2006).
13. GIATROMANOLAKI, A., Sivridis, E., Maltezos, E. *et al.* Down-regulation of intestinal-type alkaline phosphatase in the tumor vasculature and stroma provides a strong basis for explaining amifostine selectivity. **SEMIN. ONCOL.** 29 [6 Suppl 19], 14-21 (2002).
14. BRIZEL, D.M., Wasserman, T.H., Henke, M. *et al.* Phase III randomized trial of amifostine as a radioprotector in head and neck cancer. **J. CLIN. ONCOL.** 18 [19], 3339-3345 (2000).
15. WASSERMAN, T.H., Brizel, D.M., Henke, M. *et al.* Influence of intravenous amifostine on xerostomia, tumor control, and survival after radiotherapy for head-and-neck cancer: 2-year follow-up of a prospective, randomized, phase III trial. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 63 [4], 985-990 (2005).
16. COPPES, R.P., Zeilstra, L.J., Kampinga, H.H. *et al.* Early to late sparing of radiation damage to the parotid gland by adrenergic and muscarinic receptor agonists. **BR. J. CANCER** 85 [7], 1055-1063 (2001).
17. BURLAGE, F.R., Roesink, J.M., Faber, H. *et al.* Optimum dose range for the amelioration of long term radiation-induced hyposalivation using prophylactic pilocarpine treatment. **RADIOTHER. ONCOL.** (2007).
18. ROESINK, J.M., Konings, A.W., Terhaard, C.H. *et al.* Preservation of the rat parotid gland function after radiation by prophylactic pilocarpine treatment: radiation dose dependency and compensatory mechanisms. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 45 [2], 483-489 (1999).
19. BURLAGE, F.R., Roesink, J.M., Kampinga, H.H. *et al.* Protection of Salivary Function by Concomitant Pilocarpine During Radiotherapy: A Double-Blind, Randomized, Placebo-Controlled Study. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** (2007).
20. AL-QAHTANI, K., Hier, M.P., Sultanum, K. *et al.* The role of submandibular salivary gland transfer in preventing xerostomia in the chemoradiotherapy patient. **ORAL SURG. ORAL MED. ORAL PATHOL. ORAL RADIOL. ENDOD.** 101 [6], 753-756 (2006).
21. JHA, N., Seikaly, H., McGaw, T. *et al.* Submandibular salivary gland transfer prevents radiation-induced xerostomia. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 46 [1], 7-11 (2000).
22. SEIKALY, H., Jha, N., Harris, J.R. *et al.* Long-term outcomes of submandibular gland transfer for prevention of postirradiation xerostomia. **ARCH. OTOLARYNGOL. HEAD NECK SURG.** 130 [8], 956-961 (2004).

23. DOUGLAS, F. Histology & cell biology: examination and board review. Lange Medical Books, McGraw-Hill, New York. (2000).
24. GARRETT, J. The salivary system. CRC Press Inc., Boca Raton, Florida. (1988).
25. PROCTOR, G.B. and Carpenter, G.H. Regulation of salivary gland function by autonomic nerves. **AUTON. NEUROSCI.** 133 [1], 3-18 (2007).
26. ZUSSMAN, E., Yarin, A.L., and Nagler, R.M. Age- and flow-dependency of salivary viscoelasticity. **J. DENT. RES.** 86 [3], 281-285 (2007).
27. INOUE, H., Ono, K., Masuda, W. *et al.* Gender difference in unstimulated whole saliva flow rate and salivary gland sizes. **ARCH. ORAL BIOL.** 51 [12], 1055-1060 (2006).
28. RAHIM, Z.H. and Yaacob, H.B. Effects of fasting on saliva composition. **J. NIHON UNIV SCH DENT.** 33 [4], 205-210 (1991).
29. DODDS, M.W., Hsieh, S.C., and Johnson, D.A. The effect of increased mastication by daily gum-chewing on salivary gland output and dental plaque acidogenicity. **J. DENT. RES.** 70 [12], 1474-1478 (1991).
30. DOWD, F.J. Saliva and dental caries. **DENT. CLIN. NORTH AM.** 43 [4], 579-597 (1999).
31. TURNER, R.J., Paulais, M., Manganel, M. *et al.* Ion and water transport mechanisms in salivary glands. **CRIT REV. ORAL BIOL. MED.** 4 [3-4], 385-391 (1993).
32. RIVA, A., Serra, G.P., Proto, E. *et al.* The myoepithelial and basal cells of ducts of human major salivary glands: a SEM study. **ARCH. HISTOL. CYTOL.** 55 Suppl, 115-124 (1992).
33. GARRETT, J.R. and Emmelin, N. Activities of salivary myoepithelial cells: a review. **MED. BIOL.** 57 [1], 1-28 (1979).
34. GRESIK, E.W. The granular convoluted tubule (GCT) cell of rodent submandibular glands. **MICROSC. RES. TECH.** 27 [1], 1-24 (1994).
35. HALL, E. Radiobiology for the radiobiologist. Williams and Wilkins, Philadelphia, Lippincott. (2000).
36. STEEL, G. Basic clinical radiobiology. Arnold, London. (2002).
37. ZAJICEK, G., Yagil, C., and Michaeli, Y. The streaming submandibular gland. **ANAT. REC.** 213 [2], 150-158 (1985).
38. NAGLER, R.M., Baum, B.J., and Fox, P.C. Acute effects of X irradiation on the function of rat salivary glands. **RADIAT. RES.** 136 [1], 42-47 (1993).
39. ABOK, K., Brunk, U., Jung, B. *et al.* Morphologic and histochemical studies on the differing radiosensitivity of ductular and acinar cells of the rat submandibular gland. **VIRCHOWS ARCH. B CELL PATHOL. INCL. MOL. PATHOL.** 45 [4], 443-460 (1984).
40. PRATT, N.E. and Sodicoff, M. Ultrastructural injury following x-irradiation of rat parotid gland acinar cells. **ARCH. ORAL BIOL.** 17 [8], 1177-1186 (1972).
41. SODICOFF, M., Pratt, N.E., and Sholley, M.M. Ultrastructural radiation injury of rat parotid gland: a histopathologic dose-response study. **RADIAT. RES.** 58 [2], 196-208 (1974).
42. UREK, M.M., Bralic, M., Tomac, J. *et al.* Early and late effects of X-irradiation on submandibular gland: a morphological study in mice. **ARCH. MED. RES.** 36 [4], 339-343 (2005).
43. STEPHENS, L.C., King, G.K., Peters, L.J. *et al.* Acute and late radiation injury in rhesus monkey parotid glands. Evidence of interphase cell death. **AM. J. PATHOL.** 124 [3], 469-478 (1986).
44. BEUMER, J., III, Curtis, T., and Harrison, R.E. Radiation therapy of the oral cavity: sequelae and management, part 1. **HEAD NECK SURG.** 1 [4], 301-312 (1979).
45. VISSINK, A., Kalicharan, D., Gravenmade, E.J. *et al.* Acute irradiation effects on morphology and function of rat submandibular glands. **J. ORAL PATHOL. MED.** 20 [9], 449-456 (1991).
46. NAGLER, R., Marmary, Y., Fox, P.C. *et al.* Irradiation-induced damage to the salivary glands: the role of redox-active iron and copper. **RADIAT. RES.** 147 [4], 468-476 (1997).
47. NAGLER, R.M. and Laufer, D. Protection against irradiation-induced damage to salivary glands by adrenergic agonist administration. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 40 [2], 477-481 (1998).
48. PAARDEKOOPER, G.M., Cammelli, S., Zeilstra, L.J. *et al.* Radiation-induced apoptosis in relation to acute impairment of rat salivary gland function. **INT. J. RADIAT. BIOL.** 73 [6], 641-648 (1998).
49. COPPES, R.P., Meter, A., Latumalea, S.P. *et al.* Defects in muscarinic receptor-coupled signal transduction in isolated parotid gland cells after in vivo irradiation: evidence for a non-DNA target of radiation. **BR. J. CANCER** 92 [3], 539-546 (2005).

50. ROESINK, J.M., Moerland, M.A., Hoekstra, A. *et al.* Scintigraphic assessment of early and late parotid gland function after radiotherapy for head-and-neck cancer: a prospective study of dose-volume response relationships. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 58 [5], 1451-1460 (2004).
51. ZEILSTRA, L.J., Vissink, A., Konings, A.W. *et al.* Radiation induced cell loss in rat submandibular gland and its relation to gland function. **INT. J. RADIAT. BIOL.** 76 [3], 419-429 (2000).
52. MORRISON, S.J., Hemmati, H.D., Wandycz, A.M. *et al.* The purification and characterization of fetal liver hematopoietic stem cells. **PROC. NATL. ACAD. SCI. U. S. A** 92 [22], 10302-10306 (1995).
53. DOETSCH, F., Petreanu, L., Caille, I. *et al.* EGF converts transit-amplifying neurogenic precursors in the adult brain into multipotent stem cells. **NEURON** 36 [6], 1021-1034 (2002).
54. MORRISON, S.J. and Kimble, J. Asymmetric and symmetric stem-cell divisions in development and cancer. **NATURE** 441 [7097], 1068-1074 (2006).
55. RIDEOUT, W.M., III, Hochedlinger, K., Kyba, M. *et al.* Correction of a genetic defect by nuclear transplantation and combined cell and gene therapy. **CELL** 109 [1], 17-27 (2002).
56. MEISSNER, A., Wernig, M., and Jaenisch, R. Direct reprogramming of genetically unmodified fibroblasts into pluripotent stem cells. **NAT. BIOTECHNOL.** 25 [10], 1177-1181 (2007).
57. TAKAHASHI, K. and Yamanaka, S. Induction of pluripotent stem cells from mouse embryonic and adult fibroblast cultures by defined factors. **CELL** 126 [4], 663-676 (2006).
58. TAKAHASHI, K., Tanabe, K., Ohnuki, M. *et al.* Induction of pluripotent stem cells from adult human fibroblasts by defined factors. **CELL** 131 [5], 861-872 (2007).
59. KOLLER, P.C. and Doak, S.M. Serial transfer of donor marrow in radiation mouse chimaeras. **INT. J. RADIAT. BIOL.** 2, 1-7 (1960).
60. VOS, O., Davids, J., Weyzen, W. and Van Bekkum, D.W. Evidence for the cellular hypothesis in radiation protection by bone marrow cells. **ACTA PHYSIOL PHARMACOL. NEERL.** 4 [4], 482-486 (1956).
61. THOMAS, E.D. and Epstein, R.B. Bone marrow transplantation in acute leukemia. **CANC RES** 25 [9], 1521-1524 (1965).
62. CORTI, S., Locatelli, F., Papadimitriou, D. *et al.* Nuclear reprogramming and adult stem cell potential. **HISTOL. HISTOPATHOL.** 20 [3], 977-986 (2005).
63. BRAZELTON, T.R., Rossi, F.M., Keshet, G.I. *et al.* From marrow to brain: expression of neuronal phenotypes in adult mice. **SCIENCE** 290 [5497], 1775-1779 (2000).
64. EGLITIS, M.A. and Mezey, E. Hematopoietic cells differentiate into both microglia and macroglia in the brains of adult mice. **PROC. NATL. ACAD. SCI. U. S. A** 94 [8], 4080-4085 (1997).
65. PRILLER, J. Robert Feulgen Prize Lecture. Grenzganger: adult bone marrow cells populate the brain. **HISTOCHEM. CELL BIOL.** 120 [2], 85-91 (2003).
66. LAGASSE, E., Connors, H., Al-Dhalimy, M. *et al.* Purified hematopoietic stem cells can differentiate into hepatocytes in vivo. **NAT. MED.** 6 [11], 1229-1234 (2000).
67. THEISE, N.D., Badve, S., Saxena, R. *et al.* Derivation of hepatocytes from bone marrow cells in mice after radiation-induced myeloablation. **HEPATOLOGY** 31 [1], 235-240 (2000).
68. THEISE, N.D., Nimmakayalu, M., Gardner, R. *et al.* Liver from bone marrow in humans. **HEPATOLOGY** 32 [1], 11-16 (2000).
69. YANNAKI, E., Athanasiou, E., Xagorari, A. *et al.* G-CSF-primed hematopoietic stem cells or G-CSF per se accelerate recovery and improve survival after liver injury, predominantly by promoting endogenous repair programs. **EXP. HEMATOL.** 33 [1], 108-119 (2005).
70. ISHIZAWA, K., Kubo, H., Yamada, M. *et al.* Bone marrow-derived cells contribute to lung regeneration after elastase-induced pulmonary emphysema. **FEBS LETT.** 556 [1-3], 249-252 (2004).
71. KOTTON, D.N., Ma, B.Y., Cardoso, W.V. *et al.* Bone marrow-derived cells as progenitors of lung alveolar epithelium. **DEVELOPMENT** 128 [24], 5181-5188 (2001).
72. YAMADA, M., Kubo, H., Kobayashi, S. *et al.* Bone marrow-derived progenitor cells are important for lung repair after lipopolysaccharide-induced lung injury. **J. IMMUNOL.** 172 [2], 1266-1272 (2004).
73. CHO, S.W., Lim, S.H., Kim, I.K. *et al.* Small-diameter blood vessels engineered with bone marrow-derived cells. **ANN. SURG.** 241 [3], 506-515 (2005).
74. HERRERA, M.B., Bussolati, B., Bruno, S. *et al.* Mesenchymal stem cells contribute to the renal repair of acute tubular epithelial injury. **INT. J. MOL. MED.** 14 [6], 1035-1041 (2004).

75. NISHIDA, M., Fujimoto, S., Toiyama, K. *et al.* Effect of hematopoietic cytokines on renal function in cisplatin-induced ARF in mice. **BIOCHEM. BIOPHYS. RES. COMMUN.** 324 [1], 341-347 (2004).
76. POULSOM, R., Forbes, S.J., Hovalda-Dilke, K. *et al.* Bone marrow contributes to renal parenchymal turnover and regeneration. **J. PATHOL.** 195 [2], 229-235 (2001).
77. BORUE, X., Lee, S., Grove, J. *et al.* Bone marrow-derived cells contribute to epithelial engraftment during wound healing. **AM. J. PATHOL.** 165 [5], 1767-1772 (2004).
78. ADACHI, Y., Imagawa, J., Suzuki, Y. *et al.* G-CSF treatment increases side population cell infiltration after myocardial infarction in mice. **J. MOL. CELL CARDIOL.** 36 [5], 707-710 (2004).
79. VIEYRA, D.S., Jackson, K.A., and Goodell, M.A. Plasticity and tissue regenerative potential of bone marrow-derived cells. **STEM CELL REV.** 1 [1], 65-69 (2005).
80. PAUWELYN, K.A. and Verfaillie, C.M. 7. Transplantation of undifferentiated, bone marrow-derived stem cells. **CURR. TOP. DEV. BIOL.** 74, 201-251 (2006).
81. DONG, C. and Goldschmidt-Clermont, P.J. Endothelial progenitor cells: a promising therapeutic alternative for cardiovascular disease. **J. INTERV. CARDIOL.** 20 [2], 93-99 (2007).
82. KUHLMANN, M.T., Kirchof, P., Klocke, R. *et al.* G-CSF/SCF reduces inducible arrhythmias in the infarcted heart potentially via increased connexin43 expression and arteriogenesis. **J. EXP. MED.** 203 [1], 87-97 (2006).
83. POTTEN, C.S., Owen, G., and Booth, D. Intestinal stem cells protect their genome by selective segregation of template DNA strands. **J. CELL SCI.** 115 [Pt 11], 2381-2388 (2002).
84. COTSARELIS, G., Sun, T.T., and Lavker, R.M. Label-retaining cells reside in the bulge area of pilosebaceous unit: implications for follicular stem cells, hair cycle, and skin carcinogenesis. **CELL** 61 [7], 1329-1337 (1990).
85. OHYAMA, M., Terunuma, A., Tock, C.L. *et al.* Characterization and isolation of stem cell-enriched human hair follicle bulge cells. **J. CLIN. INVEST** 116 [1], 249-260 (2006).
86. JOST, S.P. Renewal of normal urothelium in adult mice. **VIRCHOWS ARCH. B CELL PATHOL. INCL. MOL. PATHOL.** 51 [1], 65-70 (1986).
87. COTSARELIS, G., Cheng, S.Z., Dong, G. *et al.* Existence of slow-cycling limbal epithelial basal cells that can be preferentially stimulated to proliferate: implications on epithelial stem cells. **CELL** 57 [2], 201-209 (1989).
88. KENNEY, N.J., Smith, G.H., Lawrence, E. *et al.* Identification of Stem Cell Units in the Terminal End Bud and Duct of the Mouse Mammary Gland. **J. BIOMED. BIOTECHNOL.** 1 [3], 133-143 (2001).
89. BICKENBACH, J.R. Identification and behavior of label-retaining cells in oral mucosa and skin. **J. DENT. RES.** 60 Spec No C, 1611-1620 (1981).
90. MEROK, J.R., Lansita, J.A., Tunstead, J.R. *et al.* Cosegregation of chromosomes containing immortal DNA strands in cells that cycle with asymmetric stem cell kinetics. **CANCER RES.** 62 [23], 6791-6795 (2002).
91. KIEL, M.J., He, S., Ashkenazi, R. *et al.* Haematopoietic stem cells do not asymmetrically segregate chromosomes or retain BrdU. **NATURE** 449 [7159], 238-242 (2007).
92. BARKER, N., van Es, J.H., Kuipers, J. *et al.* Identification of stem cells in small intestine and colon by marker gene Lgr5. **NATURE** 449 [7165], 1003-1007 (2007).
93. MA, X., Robin, C., Ottersbach, K. *et al.* The Ly-6A (Sca-1) GFP transgene is expressed in all adult mouse hematopoietic stem cells. **STEM CELLS** 20 [6], 514-521 (2002).
94. MORRIS, R.J., Liu, Y., Marles, L. *et al.* Capturing and profiling adult hair follicle stem cells. **NAT. BIOTECHNOL.** 22 [4], 411-417 (2004).
95. TUMBAR, T., Guasch, G., Greco, V. *et al.* Defining the epithelial stem cell niche in skin. **SCIENCE** 303 [5656], 359-363 (2004).
96. WOODWARD, W.A., Chen, M.S., Behbod, F. *et al.* On mammary stem cells. **J. CELL SCI.** 118 [Pt 16], 3585-3594 (2005).
97. REYNOLDS, B.A. and Weiss, S. Clonal and population analyses demonstrate that an EGF-responsive mammalian embryonic CNS precursor is a stem cell. **DEV. BIOL.** 175 [1], 1-13 (1996).
98. MARSHALL, G.P., Reynolds, B.A., and Laywell, E.D. Using the neurosphere assay to quantify neural stem cells in vivo. **CURR. PHARM. BIOTECHNOL.** 8 [3], 141-145 (2007).
99. DONTU, G., Abdallah, W.M., Foley, J.M. *et al.* In vitro propagation and transcriptional profiling of human mammary stem/progenitor cells. **GENES DEV.** 17 [10], 1253-1270 (2003).

100. WOGNUM, A.W., Eaves, A.C., and Thomas, T.E. Identification and isolation of hematopoietic stem cells. **ARCH. MED. RES.** 34 [6], 461-475 (2003).
101. SHACKLETON, M., Vaillant, F., Simpson, K.J. *et al.* Generation of a functional mammary gland from a single stem cell. **NATURE** 439 [7072], 84-88 (2006).
102. STINGL, J., Eirew, P., Ricketson, I. *et al.* Purification and unique properties of mammary epithelial stem cells. **NATURE** 439 [7079], 993-997 (2006).
103. GOODELL, M.A., Rosenzweig, M., Kim, H. *et al.* Dye efflux studies suggest that hematopoietic stem cells expressing low or undetectable levels of CD34 antigen exist in multiple species. **NAT. MED.** 3 [12], 1337-1345 (1997).
104. CHALLEN, G.A. and Little, M.H. A side order of stem cells: the SP phenotype. **STEM CELLS** 24 [1], 3-12 (2006).
105. SMALLEY, M.J. and Clarke, R.B. The mammary gland "side population": a putative stem/progenitor cell marker? **J. MAMMARY. GLAND. BIOL. NEOPLASIA.** 10 [1], 37-47 (2005).
106. MONTANARO, F., Liadaki, K., Schienda, J. *et al.* Demystifying SP cell purification: viability, yield, and phenotype are defined by isolation parameters. **EXP. CELL RES.** 298 [1], 144-154 (2004).
107. RONFARD, V., Rives, J.M., Neveux, Y. *et al.* Long-term regeneration of human epidermis on third degree burns transplanted with autologous cultured epithelium grown on a fibrin matrix. **TRANSPLANTATION** 70 [11], 1588-1598 (2000).
108. BLANPAIN, C., Lowry, W.E., Geoghegan, A. *et al.* Self-renewal, multipotency, and the existence of two cell populations within an epithelial stem cell niche. **CELL** 118 [5], 635-648 (2004).
109. PELLEGRINI, G., Traverso, C.E., Franzi, A.T. *et al.* Long-term restoration of damaged corneal surfaces with autologous cultivated corneal epithelium. **LANCET** 349 [9057], 990-993 (1997).
110. PELLEGRINI, G., Golisano, O., Paterna, P. *et al.* Location and clonal analysis of stem cells and their differentiated progeny in the human ocular surface. **J. CELL BIOL.** 145 [4], 769-782 (1999).
111. SHORTT, A.J., Secker, G.A., Notara, M.D. *et al.* Transplantation of ex vivo cultured limbal epithelial stem cells: a review of techniques and clinical results. **SURV. OPHTHALMOL.** 52 [5], 483-502 (2007).
112. BUSSOLATI, B., Bruno, S., Grange, C. *et al.* Isolation of renal progenitor cells from adult human kidney. **AM. J. PATHOL.** 166 [2], 545-555 (2005).
113. DZIEWCZAPOLSKI, G., Lie, D.C., Ray, J. *et al.* Survival and differentiation of adult rat-derived neural progenitor cells transplanted to the striatum of hemiparkinsonian rats. **EXP. NEUROL.** 183 [2], 653-664 (2003).
114. MEISSNER, K.K., Kirkham, D.L., and Doering, L.C. Transplants of neurosphere cell suspensions from aged mice are functional in the mouse model of Parkinson's. **BRAIN RES.** 1057 [1-2], 105-112 (2005).
115. BELTRAMI, A.P., Barlucchi, L., Torella, D. *et al.* Adult cardiac stem cells are multipotent and support myocardial regeneration. **CELL** 114 [6], 763-776 (2003).
116. OH, H., Bradfute, S.B., Gallardo, T.D. *et al.* Cardiac progenitor cells from adult myocardium: homing, differentiation, and fusion after infarction. **PROC. NATL. ACAD. SCI. U. S. A** 100 [21], 12313-12318 (2003).
117. MARTIN, C.M., Meeson, A.P., Robertson, S.M. *et al.* Persistent expression of the ATP-binding cassette transporter, Abcg2, identifies cardiac SP cells in the developing and adult heart. **DEV. BIOL.** 265 [1], 262-275 (2004).
118. LAUGWITZ, K.L., Moretti, A., Lam, J. *et al.* Postnatal isl1+ cardioblasts enter fully differentiated cardiomyocyte lineages. **NATURE** 433 [7026], 647-653 (2005).
119. DAWN, B., Stein, A.B., Urbanek, K. *et al.* Cardiac stem cells delivered intravascularly traverse the vessel barrier, regenerate infarcted myocardium, and improve cardiac function. **PROC. NATL. ACAD. SCI. U. S. A** 102 [10], 3766-3771 (2005).
120. HANKS, C.T. and Chaudhry, A.P. Regeneration of rat submandibular gland following partial extirpation. A light and electron microscopic study. **AM. J. ANAT.** 130 [2], 195-207 (1971).
121. BURFORD-MASON, A.P., Cummins, M.M., Brown, D.H. *et al.* Immunohistochemical analysis of the proliferative capacity of duct and acinar cells during ligation-induced atrophy and subsequent regeneration of rat parotid gland. **J. ORAL PATHOL. MED.** 22 [10], 440-446 (1993).

122. BURGESS, K.L. and Dardick, I. Cell population changes during atrophy and regeneration of rat parotid gland. **ORAL SURG. ORAL MED. ORAL PATHOL. ORAL RADIOL. ENDOD.** 85 [6], 699-706 (1998).
123. SCOTT, J., Liu, P., and Smith, P.M. Morphological and functional characteristics of acinar atrophy and recovery in the duct-ligated parotid gland of the rat. **J. DENT. RES.** 78 [11], 1711-1719 (1999).
124. TAKAHASHI, S., Shinzato, K., Nakamura, S. *et al.* Cell death and cell proliferation in the regeneration of atrophied rat submandibular glands after duct ligation. **J. ORAL PATHOL. MED.** 33 [1], 23-29 (2004).
125. TAKAHASHI, S., Nakamura, S., Domon, T. *et al.* Active participation of apoptosis and mitosis in sublingual gland regeneration of the rat following release from duct ligation. **J. MOL. HISTOL.** 36 [3], 199-205 (2005).
126. KIMOTO, M., Yura, Y., Kishino, M. *et al.* Label-retaining Cells in the Rat Submandibular Gland. **J. HISTOCHEM. CYTOCHEM.** (2007).
127. TAKAHASHI, S., Nakamura, S., Suzuki, R. *et al.* Apoptosis and mitosis of parenchymal cells in the duct-ligated rat submandibular gland. **TISSUE CELL** 32 [6], 457-463 (2000).
128. DENNY, P.C. and Denny, P.A. Dynamics of parenchymal cell division, differentiation, and apoptosis in the young adult female mouse submandibular gland. **ANAT. REC.** 254 [3], 408-417 (1999).
129. MAN, Y.G., Ball, W.D., Marchetti, L. *et al.* Contributions of intercalated duct cells to the normal parenchyma of submandibular glands of adult rats. **ANAT. REC.** 263 [2], 202-214 (2001).
130. TROWELL, O.A. The culture of mature organs in a synthetic medium. **EXP. CELL RES.** 16 [1], 118-147 (1959).
131. BROWN, A.M. In vitro transformation of submandibular gland epithelial cells and fibroblasts of adult rats by methylcholanthrene. **CANCER RES.** 33 [11], 2779-2789 (1973).
132. KREIDER, J.W. Stimulation of DNA synthesis of rat salivary gland cells in monolayer cultures by isoproterenol. **CANCER RES.** 30 [4], 980-983 (1970).
133. MARCANTE, M.L. On the in vitro behaviour of mouse submaxillary gland cells. **J. CELL SCI.** 13 [2], 441-445 (1973).
134. WIGLEY, C.B. and Franks, L.M. Salivary epithelial cells in primary culture: characterization of their growth and functional properties. **J. CELL SCI.** 20 [1], 149-165 (1976).
135. KURTH, B.E., Hazen-Martin, D.J., Sens, M.A. *et al.* Cell culture and characterization of human minor salivary gland duct cells. **J. ORAL PATHOL. MED.** 18 [4], 214-219 (1989).
136. HIRAKI, A., Shirasuna, K., Ikari, T. *et al.* Calcium induces differentiation of primary human salivary acinar cells. **J. CELL PHYSIOL** 193 [1], 55-63 (2002).
137. SABATINI, L.M., Ien-Hoffmann, B.L., Warner, T.F. *et al.* Serial cultivation of epithelial cells from human and macaque salivary glands. **IN VITRO CELL DEV. BIOL.** 27A [12], 939-948 (1991).
138. HORIE, K., Kagami, H., Hiramatsu, Y. *et al.* Selected salivary-gland cell culture and the effects of isoproterenol, vasoactive intestinal polypeptide and substance P. **ARCH. ORAL BIOL.** 41 [3], 243-252 (1996).
139. CHOPRA, D.P. and Xue-Hu, I.C. Secretion of alpha-amylase in human parotid gland epithelial cell culture. **J. CELL PHYSIOL** 155 [2], 223-233 (1993).
140. DIMITRIOU, I.D., Kapsogeorgou, E.K., bu-Helu, R.F. *et al.* Establishment of a convenient system for the long-term culture and study of non-neoplastic human salivary gland epithelial cells. **EUR. J. ORAL SCI.** 110 [1], 21-30 (2002).
141. KISHI, T., Takao, T., Fujita, K. *et al.* Clonal proliferation of multipotent stem/progenitor cells in the neonatal and adult salivary glands. **BIOCHEM. BIOPHYS. RES. COMMUN.** 340 [2], 544-552 (2006).
142. SUGITO, T., Kagami, H., Hata, K. *et al.* Transplantation of cultured salivary gland cells into an atrophic salivary gland. **CELL TRANSPLANT.** 13 [6], 691-699 (2004).
143. HISATOMI, Y., Okumura, K., Nakamura, K. *et al.* Flow cytometric isolation of endodermal progenitors from mouse salivary gland differentiate into hepatic and pancreatic lineages. **HEPATOLOGY** 39 [3], 667-675 (2004).
144. DAVID, R., Shai, E., Aframian, D.J. *et al.* Isolation and Cultivation of Integrin alpha6beta1-Expressing Salivary Gland Graft Cells: A Model for Use with an Artificial Salivary Gland. **TISSUE ENG** (2007).

145. OKUMURA, K., Nakamura, K., Hisatomi, Y. *et al.* Salivary gland progenitor cells induced by duct ligation differentiate into hepatic and pancreatic lineages. **HEPATOLOGY** 38 [1], 104-113 (2003).
146. MATSUMOTO, S., Okumura, K., Ogata, A. *et al.* Isolation of tissue progenitor cells from duct-ligated salivary glands of swine. **CLONING STEM CELLS** 9 [2], 176-190 (2007).
147. SATO, A., Okumura, K., Matsumoto, S. *et al.* Isolation, tissue localization, and cellular characterization of progenitors derived from adult human salivary glands. **CLONING STEM CELLS** 9 [2], 191-205 (2007).
148. DELPORTE, C., O'Connell, B.C., He, X. *et al.* Increased fluid secretion after adenoviral-mediated transfer of the aquaporin-1 cDNA to irradiated rat salivary glands. **PROC. NATL. ACAD. SCI. U. S. A** 94 [7], 3268-3273 (1997).
149. O'CONNELL, A.C., Baccaglioni, L., Fox, P.C. *et al.* Safety and efficacy of adenovirus-mediated transfer of the human aquaporin-1 cDNA to irradiated parotid glands of non-human primates. **CANCER GENE THER.** 6 [6], 505-513 (1999).
150. SHAN, Z., Li, J., Zheng, C. *et al.* Increased fluid secretion after adenoviral-mediated transfer of the human aquaporin-1 cDNA to irradiated miniature pig parotid glands. **MOL. THER.** 11 [3], 444-451 (2005).
151. AFRAMIAN, D.J., Redman, R.S., Yamano, S. *et al.* Tissue compatibility of two biodegradable tubular scaffolds implanted adjacent to skin or buccal mucosa in mice. **TISSUE ENG** 8 [4], 649-659 (2002).
152. JORAKU, A., Sullivan, C.A., Yoo, J.J. *et al.* Tissue engineering of functional salivary gland tissue. **LARYNGOSCOPE** 115 [2], 244-248 (2005).
153. TRAN, S.D., Wang, J., Bandyopadhyay, B.C. *et al.* Primary culture of polarized human salivary epithelial cells for use in developing an artificial salivary gland. **TISSUE ENG** 11 [1-2], 172-181 (2005).
154. KONINGS, A.W., Coppes, R.P., and Vissink, A. On the mechanism of salivary gland radiosensitivity. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 62 [4], 1187-1194 (2005).
155. KUEHNLE, I. and Goodell, M.A. The therapeutic potential of stem cells from adults. **BMJ** 325 [7360], 372-376 (2002).
156. DETEN, A., Volz, H.C., Clamors, S. *et al.* Hematopoietic stem cells do not repair the infarcted mouse heart. **CARDIOVASC. RES.** 65 [1], 52-63 (2005).
157. KUETHE, F., Figulla, H.R., Voth, M. *et al.* Mobilization of stem cells by granulocyte colony-stimulating factor for the regeneration of myocardial tissue after myocardial infarction. **DTSCH. MED. WOCHENSCHR.** 129 [9], 424-428 (2004).
158. MURRY, C.E., Soonpaa, M.H., Reinecke, H. *et al.* Haematopoietic stem cells do not transdifferentiate into cardiac myocytes in myocardial infarcts. **NATURE** 428 [6983], 664-668 (2004).
159. NOROL, F., Merlet, P., Isnard, R. *et al.* Influence of mobilized stem cells on myocardial infarct repair in a nonhuman primate model. **BLOOD** 102 [13], 4361-4368 (2003).
160. OHTSUKA, M., Takano, H., Zou, Y. *et al.* Cytokine therapy prevents left ventricular remodeling and dysfunction after myocardial infarction through neovascularization. **FASEB J.** 18 [7], 851-853 (2004).
161. ORLIC, D., Kajstura, J., Chimenti, S. *et al.* Bone marrow cells regenerate infarcted myocardium. **NATURE** 410 [6829], 701-705 (2001).
162. ORLIC, D., Kajstura, J., Chimenti, S. *et al.* Mobilized bone marrow cells repair the infarcted heart, improving function and survival. **PROC. NATL. ACAD. SCI. U. S. A** 98 [18], 10344-10349 (2001).
163. STAMM, C., Westphal, B., Kleine, H.D. *et al.* Autologous bone-marrow stem-cell transplantation for myocardial regeneration. **LANCET** 361 [9351], 45-46 (2003).
164. ABE, S., Boyer, C., Liu, X. *et al.* Cells derived from the circulation contribute to the repair of lung injury. **AM. J. RESPIR. CRIT CARE MED.** 170 [11], 1158-1163 (2004).
165. EPPERLY, M.W., Guo, H., Gretton, J.E. *et al.* Bone marrow origin of myofibroblasts in irradiation pulmonary fibrosis. **AM. J. RESPIR. CELL MOL. BIOL.** 29 [2], 213-224 (2003).
166. MINATOGUCHI, S., Takemura, G., Chen, X.H. *et al.* Acceleration of the healing process and myocardial regeneration may be important as a mechanism of improvement of cardiac function and remodeling by postinfarction granulocyte colony-stimulating factor treatment. **CIRCULATION** 109 [21], 2572-2580 (2004).

167. KAWADA, H., Fujita, J., Kinjo, K. *et al.* Nonhematopoietic mesenchymal stem cells can be mobilized and differentiate into cardiomyocytes after myocardial infarction. **BLOOD** 104 [12], 3581-3587 (2004).
168. COPPES, R.P., Vissink, A., Zeilstra, L.J. *et al.* Muscarinic receptor stimulation increases tolerance of rat salivary gland function to radiation damage. **INT. J. RADIAT. BIOL.** 72 [5], 615-625 (1997).
169. COPPES, R.P., Vissink, A., and Konings, A.W. Comparison of radiosensitivity of rat parotid and submandibular glands after different radiation schedules. **RADIOTHER. ONCOL.** 63 [3], 321-328 (2002).
170. VISSINK, A., 's-Gravenmade, E.J., Ligeon, E.E. *et al.* A functional and chemical study of radiation effects on rat parotid and submandibular/sublingual glands. **RADIAT. RES.** 124 [3], 259-265 (1990).
171. VISSINK, A., Konings, A.W., Ligeon, E.E. *et al.* Irradiation-induced changes in secretion and composition of rat saliva. **J. BIOL. BUCCALE** 18 [1], 3-8 (1990).
172. WIERENGA, P.K., Setroikromo, R., Vellenga, E. *et al.* Purging of acute myeloid leukaemia cells from stem cell grafts by hyperthermia: enhancement of the therapeutic index by the tetrapeptide AcSDKP and the alkyl-lysophospholipid ET-18-OCH(3). **BR. J. HAEMATOL.** 111 [4], 1145-1152 (2000).
173. LIN, A.L., Johnson, D.A., Wu, Y. *et al.* Measuring short-term gamma-irradiation effects on mouse salivary gland function using a new saliva collection device. **ARCH. ORAL BIOL.** 46 [11], 1085-1089 (2001).
174. COPPES, R.P., Vissink, A., and Konings, A.W. Comparison of radiosensitivity of rat parotid and submandibular glands after different radiation schedules. **RADIOTHER. ONCOL.** 63 [3], 321-328 (2002).
175. HARADA, M., Qin, Y., Takano, H. *et al.* G-CSF prevents cardiac remodeling after myocardial infarction by activating the Jak-Stat pathway in cardiomyocytes. **NAT. MED.** 11 [3], 305-311 (2005).
176. SCHNEIDER, A., Kruger, C., Steigleder, T. *et al.* The hematopoietic factor G-CSF is a neuronal ligand that counteracts programmed cell death and drives neurogenesis. **J. CLIN. INVEST** 115 [8], 2083-2098 (2005).
177. LIN, F., Moran, A., and Igarashi, P. Intrarenal cells, not bone marrow-derived cells, are the major source for regeneration in postischemic kidney. **J. CLIN. INVEST** 115 [7], 1756-1764 (2005).
178. LAPIDOT, T. and Petit, I. Current understanding of stem cell mobilization: the roles of chemokines, proteolytic enzymes, adhesion molecules, cytokines, and stromal cells. **EXP. HEMATOL.** 30 [9], 973-981 (2002).
179. VON, LUTTICHAUX, I., Notohamiprodjo, M., Wechselberger, A. *et al.* Human adult CD34-progenitor cells functionally express the chemokine receptors CCR1, CCR4, CCR7, CXCR5, and CCR10 but not CXCR4. **STEM CELLS DEV.** 14 [3], 329-336 (2005).
180. BAKER, D.G. and Krochak, R.J. The response of the microvascular system to radiation: a review. **CANCER INVEST** 7 [3], 287-294 (1989).
181. MATHES, S.J. and Alexander, J. Radiation injury. **SURG. ONCOL. CLIN. N. AM.** 5 [4], 809-824 (1996).
182. SHOLLEY, M.M., Sodicoff, M., and Pratt, N.E. Early radiation injury in the rat parotid gland. Reaction of acinar cells and vascular endothelium. **LAB INVEST** 31 [4], 340-354 (1974).
183. JAENKE, R.S., Robbins, M.E., Bywaters, T. *et al.* Capillary endothelium. Target site of renal radiation injury. **LAB INVEST** 68 [4], 396-405 (1993).
184. DIMITRIEVICH, G.S., Fischer-Dzoga, K., and Griem, M.L. Radiosensitivity of vascular tissue. I. Differential radiosensitivity of capillaries: a quantitative in vivo study. **RADIAT. RES.** 99 [3], 511-535 (1984).
185. LOMBAERT, I.M., Wierenga, P.K., Kok, T. *et al.* Mobilization of bone marrow stem cells by granulocyte colony-stimulating factor ameliorates radiation-induced damage to salivary glands. **CLIN. CANCER RES.** 12 [6], 1804-1812 (2006).
186. ZENG, L., Hu, Q., Wang, X. *et al.* Bioenergetic and functional consequences of bone marrow-derived multipotent progenitor cell transplantation in hearts with postinfarction left ventricular remodeling. **CIRCULATION** 115 [14], 1866-1875 (2007).
187. YOUNG, P.P., Vaughan, D.E., and Hatzopoulos, A.K. Biologic properties of endothelial progenitor cells and their potential for cell therapy. **PROG. CARDIOVASC. DIS.** 49 [6], 421-429 (2007).

188. DE, H.G., Engel, C., Dontje, B. *et al.* Mutual inhibition of murine erythropoiesis and granulopoiesis during combined erythropoietin, granulocyte colony-stimulating factor, and stem cell factor administration: in vivo interactions and dose-response surfaces. **BLOOD**. 84 [12], 4157-4163 (1994).
189. LAPIDOT, T., Dar, A., and Kollet, O. How do stem cells find their way home? **BLOOD** 106 [6], 1901-1910 (2005).
190. DE, H.G., Dontje, B., and Nijhof, W. Concepts of hemopoietic cell amplification. Synergy, redundancy and pleiotropy of cytokines affecting the regulation of erythropoiesis. **LEUK. LYMPHOMA**. 22 [5-6], 385-394 (1996).
191. BODINE, D.M., Seidel, N.E., Gale, M.S. *et al.* Efficient retrovirus transduction of mouse pluripotent hematopoietic stem cells mobilized into the peripheral blood by treatment with granulocyte colony-stimulating factor and stem cell factor. **BLOOD** 84 [5], 1482-1491 (1994).
192. MOLINEUX, G., McCrea, C., Yan, X.Q. *et al.* Flt-3 ligand synergizes with granulocyte colony-stimulating factor to increase neutrophil numbers and to mobilize peripheral blood stem cells with long-term repopulating potential. **BLOOD** 89 [11], 3998-4004 (1997).
193. NEIPP, M., Zorina, T., Domenick, M.A. *et al.* Effect of FLT3 ligand and granulocyte colony-stimulating factor on expansion and mobilization of facilitating cells and hematopoietic stem cells in mice: kinetics and repopulating potential. **BLOOD** 92 [9], 3177-3188 (1998).
194. SUDO, Y., Shimazaki, C., Ashihara, E. *et al.* Synergistic effect of FLT-3 ligand on the granulocyte colony-stimulating factor-induced mobilization of hematopoietic stem cells and progenitor cells into blood in mice. **BLOOD** 89 [9], 3186-3191 (1997).
195. ROEDER, I., de, H.G., Engel, C. *et al.* Interactions of erythropoietin, granulocyte colony-stimulating factor, stem cell factor, and interleukin-11 on murine hematopoiesis during simultaneous administration. **BLOOD**. 91 [9], 3222-3229 (1998).
196. DAWN, B., Guo, Y., Rezazadeh, A. *et al.* Postinfarct cytokine therapy regenerates cardiac tissue and improves left ventricular function. **CIRC. RES.** 98 [8], 1098-1105 (2006).
197. KAWADA, H., Takizawa, S., Takanashi, T. *et al.* Administration of hematopoietic cytokines in the subacute phase after cerebral infarction is effective for functional recovery facilitating proliferation of intrinsic neural stem/progenitor cells and transition of bone marrow-derived neuronal cells. **CIRCULATION** 113 [5], 701-710 (2006).
198. LAVAZAI, E., Pogu, S., Sai, P. *et al.* Cytokine mobilization of bone marrow cells and pancreatic lesion do not improve streptozotocin-induced diabetes in mice by transdifferentiation of bone marrow cells into insulin-producing cells. **DIABETES METAB** 33 [1], 68-78 (2007).
199. SESTI, C., Hale, S.L., Lutzko, C. *et al.* Granulocyte colony-stimulating factor and stem cell factor improve contractile reserve of the infarcted left ventricle independent of restoring muscle mass. **J. AM. COLL. CARDIOL.** 46 [9], 1662-1669 (2005).
200. BECKER, M., Schroth, G., Zbaren, P. *et al.* Long-term changes induced by high-dose irradiation of the head and neck region: imaging findings. **RADIOGRAPHICS** 17 [1], 5-26 (1997).
201. BARBARA, N.P., Wrana, J.L., and Letarte, M. Endoglin is an accessory protein that interacts with the signaling receptor complex of multiple members of the transforming growth factor-beta superfamily. **J. BIOL. CHEM.** 274 [2], 584-594 (1999).
202. BLANCO, F.J., Santibanez, J.F., Guerrero-Esteo, M. *et al.* Interaction and functional interplay between endoglin and ALK-1, two components of the endothelial transforming growth factor-beta receptor complex. **J. CELL PHYSIOL** 204 [2], 574-584 (2005).
203. LEBRIN, F., Goumans, M.J., Jonker, L. *et al.* Endoglin promotes endothelial cell proliferation and TGF-beta/ALK1 signal transduction. **EMBO J.** 23 [20], 4018-4028 (2004).
204. VAN LAAKE, L.W., van den, D.S., Post, S. *et al.* Endoglin has a crucial role in blood cell-mediated vascular repair. **CIRCULATION** 114 [21], 2288-2297 (2006).
205. IRIE, H., Tatsumi, T., Takamiya, M. *et al.* Carbon dioxide-rich water bathing enhances collateral blood flow in ischemic hindlimb via mobilization of endothelial progenitor cells and activation of NO-cGMP system. **CIRCULATION** 111 [12], 1523-1529 (2005).
206. AHLNER, B.H. and Lind, M.G. The effect of irradiation on blood flow through rabbit submandibular glands. **EUR. ARCH. OTORHINOLARYNGOL.** 251 [2], 72-75 (1994).
207. ARTHUR, H.M., Ure, J., Smith, A.J. *et al.* Endoglin, an ancillary TGFbeta receptor, is required for extraembryonic angiogenesis and plays a key role in heart development. **DEV. BIOL.** 217 [1], 42-53 (2000).

208. QI, F., Sugihara, T., Hattori, Y. *et al.* Functional and morphological damage of endothelium in rabbit ear artery following irradiation with cobalt60. **BR. J. PHARMACOL.** 123 [4], 653-660 (1998).
209. SUGIHARA, T., Hattori, Y., Yamamoto, Y. *et al.* Preferential impairment of nitric oxide-mediated endothelium-dependent relaxation in human cervical arteries after irradiation. **CIRCULATION** 100 [6], 635-641 (1999).
210. JERKIC, M., Rivas-Elena, J.V., Prieto, M. *et al.* Endoglin regulates nitric oxide-dependent vasodilatation. **FASEB J.** 18 [3], 609-611 (2004).
211. LEDA, Y., Fujita, J., Ieda, M. *et al.* G-CSF and HGF: combination of vasculogenesis and angiogenesis synergistically improves recovery in murine hind limb ischemia. **J. MOL. CELL CARDIOL.** 42 [3], 540-548 (2007).
212. OHKI, Y., Heissig, B., Sato, Y. *et al.* Granulocyte colony-stimulating factor promotes neovascularization by releasing vascular endothelial growth factor from neutrophils. **FASEB J.** 19 [14], 2005-2007 (2005).
213. REHMAN, J., Li, J., Orschell, C.M. *et al.* Peripheral blood "endothelial progenitor cells" are derived from monocyte/macrophages and secrete angiogenic growth factors. **CIRCULATION** 107 [8], 1164-1169 (2003).
214. GAMMILL, H.S., Lin, C., and Hubel, C.A. Endothelial progenitor cells and preeclampsia. **FRONT BIOSCI.** 12, 2383-2394 (2007).
215. SHEPHERD, R.M., Capoccia, B.J., Devine, S.M. *et al.* Angiogenic cells can be rapidly mobilized and efficiently harvested from the blood following treatment with AMD3100. **BLOOD** 108 [12], 3662-3667 (2006).
216. BUSSOLINO, F., Ziche, M., Wang, J.M. *et al.* In vitro and in vivo activation of endothelial cells by colony-stimulating factors. **J. CLIN. INVEST** 87 [3], 986-995 (1991).
217. BUSSOLINO, F., Wang, J.M., Defilippi, P. *et al.* Granulocyte- and granulocyte-macrophage-colony stimulating factors induce human endothelial cells to migrate and proliferate. **NATURE** 337 [6206], 471-473 (1989).
218. TAKAHASHI, T., Kalka, C., Masuda, H. *et al.* Ischemia- and cytokine-induced mobilization of bone marrow-derived endothelial progenitor cells for neovascularization. **NAT. MED.** 5 [4], 434-438 (1999).
219. TERMAN, B.I., Carrion, M.E., Kovacs, E. *et al.* Identification of a new endothelial cell growth factor receptor tyrosine kinase. **ONCOGENE** 6 [9], 1677-1683 (1991).
220. LOMBAERT, I.M., Brunsting, J.F., Wierenga, P.K. *et al.* Rescue of salivary gland function stem cell transplantation in irradiated glands. **PLoS ONE** (2008). - Submitted
221. SOLANILLA, A., Grosset, C., Lemerrier, C. *et al.* Expression of Flt3-ligand by the endothelial cell. **LEUKEMIA** 14 [1], 153-162 (2000).
222. CODERRE, J.A., Morris, G.M., Micca, P.L. *et al.* Late effects of radiation on the central nervous system: role of vascular endothelial damage and glial stem cell survival. **RADIAT. RES.** 166 [3], 495-503 (2006).
223. PETERSON, L.M., Evans, M.L., Graham, M.M. *et al.* Vascular response to radiation injury in the rat lung. **RADIAT. RES.** 129 [2], 139-148 (1992).
224. GUPTA, A., Dhawahir-Scala, F., Smith, A. *et al.* Radiation retinopathy: case report and review. **BMC. OPHTHALMOL.** 7, 6 (2007).
225. DENNY, P.C., Ball, W.D., and Redman, R.S. Salivary glands: a paradigm for diversity of gland development. **CRIT REV. ORAL BIOL. MED.** 8 [1], 51-75 (1997).
226. COUZIN, J. Clinical trials. A shot of bone marrow can help the heart. **SCIENCE** 313 [5794], 1715-1716 (2006).
227. REYNOLDS, B.A. and Weiss, S. Generation of neurons and astrocytes from isolated cells of the adult mammalian central nervous system. **SCIENCE** 255 [5052], 1707-1710 (1992).
228. CHEN, J., Hersmus, N., Van, D., V *et al.* The adult pituitary contains a cell population displaying stem/progenitor cell and early embryonic characteristics. **ENDOCRINOLOGY** 146 [9], 3985-3998 (2005).
229. TROPEPE, V., Coles, B.L., Chiasson, B.J. *et al.* Retinal stem cells in the adult mammalian eye. **SCIENCE** 287 [5460], 2032-2036 (2000).
230. TOMA, J.G., Akhavan, M., Fernandes, K.J. *et al.* Isolation of multipotent adult stem cells from the dermis of mammalian skin. **NAT. CELL BIOL.** 3 [9], 778-784 (2001).
231. LI, H., Liu, H., and Heller, S. Pluripotent stem cells from the adult mouse inner ear. **NAT. MED.** 9 [10], 1293-1299 (2003).

232. SEABERG, R.M., Smukler, S.R., Kieffer, T.J. *et al.* Clonal identification of multipotent precursors from adult mouse pancreas that generate neural and pancreatic lineages. **NAT. BIOTECHNOL.** 22 [9], 1115-1124 (2004).
233. BURGER, P.E., Xiong, X., Coetzee, S. *et al.* Sca-1 expression identifies stem cells in the proximal region of prostatic ducts with high capacity to reconstitute prostatic tissue. **PROC. NATL. ACAD. SCI. U. S. A** 102 [20], 7180-7185 (2005).
234. KAYAHARA, T., Sawada, M., Takaishi, S. *et al.* Candidate markers for stem and early progenitor cells, Musashi-1 and Hes1, are expressed in crypt base columnar cells of mouse small intestine. **FEBS LETT.** 535 [1-3], 131-135 (2003).
235. CHIASSON, B.J., Tropepe, V., Morshead, C.M. *et al.* Adult mammalian forebrain ependymal and subependymal cells demonstrate proliferative potential, but only subependymal cells have neural stem cell characteristics. **J. NEUROSCI.** 19 [11], 4462-4471 (1999).
236. KAWASE, Y., Yanagi, Y., Takato, T. *et al.* Characterization of multipotent adult stem cells from the skin: transforming growth factor-beta (TGF-beta) facilitates cell growth. **EXP. CELL RES.** 295 [1], 194-203 (2004).
237. MEDINA, R.J., Kataoka, K., Takaishi, M. *et al.* Isolation of epithelial stem cells from dermis by a three-dimensional culture system. **J. CELL BIOCHEM.** 98 [1], 174-184 (2006).
238. WELM, B.E., Tepera, S.B., Venezia, T. *et al.* Sca-1(pos) cells in the mouse mammary gland represent an enriched progenitor cell population. **DEV. BIOL.** 245 [1], 42-56 (2002).
239. BAUM, B.J. and Tran, S.D. Synergy between genetic and tissue engineering: creating an artificial salivary gland. **PERIODONTOL.** 2000. 41, 218-223 (2006).
240. MARSHMAN, E., Booth, C., and Potten, C.S. The intestinal epithelial stem cell. **BIOESSAYS** 24 [1], 91-98 (2002).
241. WILSON, A. and Trumpp, A. Bone-marrow haematopoietic-stem-cell niches. **NAT. REV. IMMUNOL.** 6 [2], 93-106 (2006).
242. LOMBAERT, I.M., Brunsting, J.F., Wierenga, P.K. *et al.* Flt-3 Ligand/Granulocyte-Colony Stimulating Factor/Stem Cell Factor treatment ameliorates radiation-induced parenchymal and vascular damage in the salivary gland. **INT J RAD ONC BIOL PHYS** (2008). - Submitted
243. LOMBAERT, I.M., Brunsting, J.B., Wierenga, P.K. *et al.* Keratinocyte Growth Factor prevents radiation damage to salivary glands by expansion of the stem/progenitor pool. **STEM CELLS** (2008). - Submitted
244. VISVADER, J.E. and Lindeman, G.J. Mammary stem cells and mammapoiesis. **CANCER RES.** 66 [20], 9798-9801 (2006).
245. YANO, S., Ito, Y., Fujimoto, M. *et al.* Characterization and localization of side population cells in mouse skin. **STEM CELLS** 23 [6], 834-841 (2005).
246. HERRERA, M.B., Bruno, S., Buttiglieri, S. *et al.* Isolation and characterization of a stem cell population from adult human liver. **STEM CELLS** 24 [12], 2840-2850 (2006).
247. CAMPOS, L.S., Leone, D.P., Relvas, J.B. *et al.* Beta1 integrins activate a MAPK signalling pathway in neural stem cells that contributes to their maintenance. **DEVELOPMENT** 131 [14], 3433-3444 (2004).
248. HALL, P.E., Lathia, J.D., Miller, N.G. *et al.* Integrins are markers of human neural stem cells. **STEM CELLS** 24 [9], 2078-2084 (2006).
249. NAGATO, M., Heike, T., Kato, T. *et al.* Prospective characterization of neural stem cells by flow cytometry analysis using a combination of surface markers. **J. NEUROSCI. RES.** 80 [4], 456-466 (2005).
250. ISRAEL, E., Kapelushnik, J., Yermiahu, T. *et al.* Expression of CD24 on CD19- CD79a+ early B-cell progenitors in human bone marrow. **CELL IMMUNOL.** 236 [1-2], 171-178 (2005).
251. SAGRINATI, C., Netti, G.S., Mazzinghi, B. *et al.* Isolation and characterization of multipotent progenitor cells from the Bowman's capsule of adult human kidneys. **J. AM. SOC. NEPHROL.** 17 [9], 2443-2456 (2006).
252. LAWSON, D.A., Xin, L., Lukacs, R.U. *et al.* Isolation and functional characterization of murine prostate stem cells. **PROC. NATL. ACAD. SCI. U. S. A** 104 [1], 181-186 (2007).
253. PANCHISION, D.M., Chen, H.L., Pistollato, F. *et al.* Optimized flow cytometric analysis of central nervous system tissue reveals novel functional relationships among cells expressing CD133, CD15, and CD24. **STEM CELLS** 25 [6], 1560-1570 (2007).
254. OSAWA, M., Hanada, K., Hamada, H. *et al.* Long-term lymphohematopoietic reconstitution by a single CD34-low/negative hematopoietic stem cell. **SCIENCE** 273 [5272], 242-245 (1996).

255. ZHAO, Y., Lin, Y., Zhan, Y. *et al.* Murine hematopoietic stem cell characterization and its regulation in BM transplantation. **BLOOD** 96 [9], 3016-3022 (2000).
256. XIN, L., Lawson, D.A., and Witte, O.N. The Sca-1 cell surface marker enriches for a prostate-regenerating cell subpopulation that can initiate prostate tumorigenesis. **PROC. NATL. ACAD. SCI. U. S. A** 102 [19], 6942-6947 (2005).
257. KOTTON, D.N., Summer, R.S., Sun, X. *et al.* Stem cell antigen-1 expression in the pulmonary vascular endothelium. **AM. J. PHYSIOL LUNG CELL MOL. PHYSIOL** 284 [6], L990-L996 (2003).
258. FERNANDES, K.J., McKenzie, I.A., Mill, P. *et al.* A dermal niche for multipotent adult skin-derived precursor cells. **NAT. CELL BIOL.** 6 [11], 1082-1093 (2004).
259. TOMA, J.G., McKenzie, I.A., Bagli, D. *et al.* Isolation and characterization of multipotent skin-derived precursors from human skin. **STEM CELLS** 23 [6], 727-737 (2005).
260. PETERSEN, B.E., Grossbard, B., Hatch, H. *et al.* Mouse A6-positive hepatic oval cells also express several hematopoietic stem cell markers. **HEPATOLOGY** 37 [3], 632-640 (2003).
261. GUSSONI, E., Soneoka, Y., Strickland, C.D. *et al.* Dystrophin expression in the mdx mouse restored by stem cell transplantation. **NATURE** 401 [6751], 390-394 (1999).
262. LEE, J.Y., Qu-Petersen, Z., Cao, B. *et al.* Clonal isolation of muscle-derived cells capable of enhancing muscle regeneration and bone healing. **J. CELL BIOL.** 150 [5], 1085-1100 (2000).
263. ESPOSITO, I., Kleeff, J., Bischoff, S.C. *et al.* The stem cell factor-c-kit system and mast cells in human pancreatic cancer. **LAB INVEST** 82 [11], 1481-1492 (2002).
264. TORIHASHI, S., Ward, S.M., and Sanders, K.M. Development of c-Kit-positive cells and the onset of electrical rhythmicity in murine small intestine. **GASTROENTEROLOGY** 112 [1], 144-155 (1997).
265. CHUI, X., Egami, H., Yamashita, J. *et al.* Immunohistochemical expression of the c-kit proto-oncogene product in human malignant and non-malignant breast tissues. **BR. J. CANCER** 73 [10], 1233-1236 (1996).
266. MORINI, M., Bettini, G., Preziosi, R. *et al.* C-kit gene product (CD117) immunoreactivity in canine and feline paraffin sections. **J. HISTOCHEM. CYTOCHEM.** 52 [5], 705-708 (2004).
267. RAMSFJELL, V., Bryder, D., Bjorgvinsdottir, H. *et al.* Distinct requirements for optimal growth and in vitro expansion of human CD34(+)CD38(-) bone marrow long-term culture-initiating cells (LTC-IC), extended LTC-IC, and murine in vivo long-term reconstituting stem cells. **BLOOD** 94 [12], 4093-4102 (1999).
268. POTTEN, C.S., Booth, C., Tudor, G.L. *et al.* Identification of a putative intestinal stem cell and early lineage marker; musashi-1. **DIFFERENTIATION** 71 [1], 28-41 (2003).
269. SUGIYAMA-NAKAGIRI, Y., Akiyama, M., Shibata, S. *et al.* Expression of RNA-binding protein Musashi in hair follicle development and hair cycle progression. **AM. J. PATHOL.** 168 [1], 80-92 (2006).
270. AKASAKA, Y., Saikawa, Y., Fujita, K. *et al.* Expression of a candidate marker for progenitor cells, Musashi-1, in the proliferative regions of human antrum and its decreased expression in intestinal metaplasia. **HISTOPATHOLOGY** 47 [4], 348-356 (2005).
271. CLARKE, R.B., Spence, K., Anderson, E. *et al.* A putative human breast stem cell population is enriched for steroid receptor-positive cells. **DEV. BIOL.** 277 [2], 443-456 (2005).
272. EPSTEIN, S.P., Wolosin, J.M., and Asbell, P.A. P63 expression levels in side population and low light scattering ocular surface epithelial cells. **TRANS. AM. OPHTHALMOL. SOC.** 103, 187-199 (2005).
273. KAI-HONG, J., Jun, X., Kai-Meng, H. *et al.* P63 expression pattern during rat epidermis morphogenesis and the role of p63 as a marker for epidermal stem cells. **J. CUTAN. PATHOL.** 34 [2], 154-159 (2007).
274. BEHBOD, F., Xian, W., Shaw, C.A. *et al.* Transcriptional profiling of mammary gland side population cells. **STEM CELLS** 24 [4], 1065-1074 (2006).
275. WANG, B.Y., Gil, J., Kaufman, D. *et al.* P63 in pulmonary epithelium, pulmonary squamous neoplasms, and other pulmonary tumors. **HUM. PATHOL.** 33 [9], 921-926 (2002).
276. SIGNORETTI, S., Pires, M.M., Lindauer, M. *et al.* p63 regulates commitment to the prostate cell lineage. **PROC. NATL. ACAD. SCI. U. S. A** 102 [32], 11355-11360 (2005).
277. YOUNG, J.A. and Lennep, E.W. The morphology of salivary glands. (1978). London, New York, San Francisco, Academic Press.

278. LEONCINI, P., Cintonino, M., Vindigni, C. *et al.* Distribution of cytoskeletal and contractile proteins in normal and tumour bearing salivary and lacrimal glands. **VIRCHOWS ARCH. A PATHOL. ANAT. HISTOPATHOL.** 412 [4], 329-337 (1988).
279. MARTINS, M.D., Cavalcanti, d.A., V, Raitz, R. *et al.* Expression of cytoskeletal proteins in developing human minor salivary glands. **EUR. J. ORAL SCI.** 110 [4], 316-321 (2002).
280. FARINA, V. and Zedda, M. On the expression of cytokeratins and their distribution in some rabbit gland tissues. **EUR. J. HISTOCHEM.** 36 [4], 479-488 (1992).
281. OGAWA, C., Iwatsuki, H., Sasaki, K. *et al.* [Keratin filaments in epithelial cells of the excretory ducts of rabbit submandibular glands--an immunohistochemical and ultraimmunohistochemical study]. **KAIBOGAKU ZASSHI** 76 [4], 389-398 (2001).
282. ZEDDA, M. and Farina, V. Basket and basal-duct cells in domestic animals: different cytokeratin expression and shape. **ANAT. HISTOL. EMBRYOL.** 25 [4], 257-262 (1996).
283. SOZMEN, M., Brown, P.J., and Eveson, J.W. Cytokeratin immunostaining in normal dog major and minor salivary glands. **VET. RES.** 29 [5], 457-465 (1998).
284. BARTEL-FRIEDRICH, S., Friedrich, R.E., Moll, R. *et al.* Immunohistochemical detection of cytokeratins in the irradiated rat mandibular gland. **ANTICANCER RES.** 19 [4A], 2405-2409 (1999).
285. BARTEL-FRIEDRICH, S., Friedrich, R.E., Lautenschlager, C. *et al.* Dose-response relationships on the expression profile of cytokeratins and vimentin in rat submandibular glands following fractionated irradiation. **ANTICANCER RES.** 20 [6D], 4917-4926 (2000).
286. GUSTAFSSON, H., Aalto, Y., Franzen, L. *et al.* Effects of fractionated irradiation on the cytoskeleton and basal lamina in parotid glands--an immunohistochemical study. **ACTA ONCOL.** 37 [1], 33-40 (1998).
287. LAOIDE, B.M., Courty, Y., Gastinne, I. *et al.* Immortalised mouse submandibular epithelial cell lines retain polarised structural and functional properties. **J. CELL SCI.** 109 (Pt 12), 2789-2800 (1996).
288. TAKAI, Y., Murase, N., Hosaka, M. *et al.* Immunohistochemical localization of keratin in experimental carcinoma of the mouse submandibular gland. **J. ORAL PATHOL.** 15 [1], 5-10 (1986).
289. HYNES, R.O. Integrins: bidirectional, allosteric signaling machines. **CELL** 110 [6], 673-687 (2002).
290. BRAKEBUSCH, C. and Fassler, R. Beta 1 integrin function in vivo: adhesion, migration and more. **CANCER METASTASIS REV.** 24 [3], 403-411 (2005).
291. LAM, K., Zhang, L., Bewick, M. *et al.* HSG cells differentiated by culture on extracellular matrix involves induction of S-adenosylmethionine decarboxylase and ornithine decarboxylase. **J. CELL PHYSIOL** 203 [2], 353-361 (2005).
292. NIEOULLON, V., Belvindrah, R., Rougon, G. *et al.* Mouse CD24 is required for homeostatic cell renewal. **CELL TISSUE RES.** 329 [3], 457-467 (2007).
293. MEDINA, A., Ghaffari, A., Kilani, R.T. *et al.* The role of stratifin in fibroblast-keratinocyte interaction. **MOL. CELL BIOCHEM.** 305 [1-2], 255-264 (2007).
294. DELLAMBRA, E., Golisano, O., Bondanza, S. *et al.* Downregulation of 14-3-3sigma prevents clonal evolution and leads to immortalization of primary human keratinocytes. **J. CELL BIOL.** 149 [5], 1117-1130 (2000).
295. PELLEGRINI, G., Dellambra, E., Golisano, O. *et al.* p63 identifies keratinocyte stem cells. **PROC. NATL. ACAD. SCI. U. S. A** 98 [6], 3156-3161 (2001).
296. YANG, A., Kaghad, M., Caput, D. *et al.* On the shoulders of giants: p63, p73 and the rise of p53. **TRENDS GENET.** 18 [2], 90-95 (2002).
297. MILLS, A.A., Zheng, B., Wang, X.J. *et al.* p63 is a p53 homologue required for limb and epidermal morphogenesis. **NATURE** 398 [6729], 708-713 (1999).
298. LITTLE, N.A. and Jochemsen, A.G. p63. **INT. J. BIOCHEM. CELL BIOL.** 34 [1], 6-9 (2002).
299. BILAL, H., Handra-Luca, A., Bertrand, J.C. *et al.* P63 is expressed in basal and myoepithelial cells of human normal and tumor salivary gland tissues. **J. HISTOCHEM. CYTOCHEM.** 51 [2], 133-139 (2003).
300. GUDJONSSON, T., Adriance, M.C., Sternlicht, M.D. *et al.* Myoepithelial cells: their origin and function in breast morphogenesis and neoplasia. **J. MAMMARY. GLAND. BIOL. NEOPLASIA.** 10 [3], 261-272 (2005).
301. POLYAK, K. and Hu, M. Do myoepithelial cells hold the key for breast tumor progression? **J. MAMMARY. GLAND. BIOL. NEOPLASIA.** 10 [3], 231-247 (2005).

302. STINGL, J., Raouf, A., Emerman, J.T. *et al.* Epithelial progenitors in the normal human mammary gland. **J. MAMMARY. GLAND. BIOL. NEOPLASIA.** 10 [1], 49-59 (2005).
303. HOLMES, C. and Stanford, W.L. Concise review: stem cell antigen-1: expression, function, and enigma. **STEM CELLS** 25 [6], 1339-1347 (2007).
304. WASKOW, C., Paul, S., Haller, C. *et al.* Viable c-Kit(W/W) mutants reveal pivotal role for c-kit in the maintenance of lymphopoiesis. **IMMUNITY.** 17 [3], 277-288 (2002).
305. ASHMAN, L.K., Ferrao, P., Cole, S.R. *et al.* Effects of mutant c-Kit in early myeloid cells. **LEUK. LYMPHOMA** 34 [5-6], 451-461 (1999).
306. BESMER, P., Manova, K., Duttlinger, R. *et al.* The kit-ligand (steel factor) and its receptor c-kit/W: pleiotropic roles in gametogenesis and melanogenesis. **DEV. SUPPL.** , 125-137 (1993).
307. MOLOFSKY, A.V., Pardal, R., and Morrison, S.J. Diverse mechanisms regulate stem cell self-renewal. **CURR. OPIN. CELL BIOL.** 16 [6], 700-707 (2004).
308. MORRISON, S.J., Perez, S.E., Qiao, Z. *et al.* Transient Notch activation initiates an irreversible switch from neurogenesis to gliogenesis by neural crest stem cells. **CELL** 101 [5], 499-510 (2000).
309. OKUYAMA, R., Ogawa, E., Nagoshi, H. *et al.* p53 homologue, p51/p63, maintains the immaturity of keratinocyte stem cells by inhibiting Notch1 activity. **ONCOGENE** 26 [31], 4478-4488 (2007).
310. CALLAHAN, R. and Egan, S.E. Notch signaling in mammary development and oncogenesis. **J. MAMMARY. GLAND. BIOL. NEOPLASIA.** 9 [2], 145-163 (2004).
311. LAMMERT, E., Brown, J., and Melton, D.A. Notch gene expression during pancreatic organogenesis. **MECH. DEV.** 94 [1-2], 199-203 (2000).
312. RADTKE, F., Wilson, A., Mancini, S.J. *et al.* Notch regulation of lymphocyte development and function. **NAT. IMMUNOL.** 5 [3], 247-253 (2004).
313. FRE, S., Huyghe, M., Mourikis, P. *et al.* Notch signals control the fate of immature progenitor cells in the intestine. **NATURE** 435 [7044], 964-968 (2005).
314. KANEKO, Y., Sakakibara, S., Imai, T. *et al.* Musashi1: an evolutionally conserved marker for CNS progenitor cells including neural stem cells. **DEV. NEUROSCI.** 22 [1-2], 139-153 (2000).
315. SAKAKIBARA, S., Nakamura, Y., Yoshida, T. *et al.* RNA-binding protein Musashi family: roles for CNS stem cells and a subpopulation of ependymal cells revealed by targeted disruption and antisense ablation. **PROC. NATL. ACAD. SCI. U. S. A** 99 [23], 15194-15199 (2002).
316. SAKAKIBARA, S., Nakamura, Y., Satoh, H. *et al.* Rna-binding protein Musashi2: developmentally regulated expression in neural precursor cells and subpopulations of neurons in mammalian CNS. **J. NEUROSCI.** 21 [20], 8091-8107 (2001).
317. NATIONAL CANCER INSTITUTE and U.S. National Institute of Health. www.cancer.gov. (2007).
318. BURLAGE, F.R., Coppes, R.P., Meertens, H. *et al.* Parotid and submandibular/sublingual salivary flow during high dose radiotherapy. **RADIOTHER. ONCOL.** 61 [3], 271-274 (2001).
319. CHEN, L., Brizel, D.M., Rabbani, Z.N. *et al.* The protective effect of recombinant human keratinocyte growth factor on radiation-induced pulmonary toxicity in rats. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 60 [5], 1520-1529 (2004).
320. SAVLA, U. and Waters, C.M. Barrier function of airway epithelium: effects of radiation and protection by keratinocyte growth factor. **RADIAT. RES.** 150 [2], 195-203 (1998).
321. TERRY, N.H., Brinkley, J., Doig, A.J. *et al.* Cellular kinetics of murine lung: model system to determine basis for radioprotection with keratinocyte growth factor. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 58 [2], 435-444 (2004).
322. YI, E.S., Williams, S.T., Lee, H. *et al.* Keratinocyte growth factor ameliorates radiation- and bleomycin-induced lung injury and mortality. **AM. J. PATHOL.** 149 [6], 1963-1970 (1996).
323. FARRELL, C.L., Bready, J.V., Rex, K.L. *et al.* Keratinocyte growth factor protects mice from chemotherapy and radiation-induced gastrointestinal injury and mortality. **CANCER RES.** 58 [5], 933-939 (1998).
324. FARRELL, C.L., Rex, K.L., Kaufman, S.A. *et al.* Effects of keratinocyte growth factor in the squamous epithelium of the upper aerodigestive tract of normal and irradiated mice. **INT. J. RADIAT. BIOL.** 75 [5], 609-620 (1999).
325. DORR, W., Spekl, K., and Farrell, C.L. The effect of keratinocyte growth factor on healing of manifest radiation ulcers in mouse tongue epithelium. **CELL PROLIF.** 35 Suppl 1, 86-92 (2002).

326. DORR, W., Noack, R., Spekl, K. *et al.* Modification of oral mucositis by keratinocyte growth factor: single radiation exposure. **INT. J. RADIAT. BIOL.** 77 [3], 341-347 (2001).
327. ANDREADIS, S.T., Hamoen, K.E., Yarmush, M.L. *et al.* Keratinocyte growth factor induces hyperproliferation and delays differentiation in a skin equivalent model system. **FASEB J.** 15 [6], 898-906 (2001).
328. BORGES, L., Rex, K.L., Chen, J.N. *et al.* A protective role for keratinocyte growth factor in a murine model of chemotherapy and radiotherapy-induced mucositis. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 66 [1], 254-262 (2006).
329. IMANISHI, J., Kamiyama, K., Iguchi, I. *et al.* Growth factors: importance in wound healing and maintenance of transparency of the cornea. **PROG. RETIN. EYE RES.** 19 [1], 113-129 (2000).
330. SLONINA, D., Hoinkis, C., and Dorr, W. Effect of keratinocyte growth factor on radiation survival and colony size of human epidermal keratinocytes in vitro. **RADIAT. RES.** 156 [6], 761-766 (2001).
331. ULICH, T.R., Yi, E.S., Longmuir, K. *et al.* Keratinocyte growth factor is a growth factor for type II pneumocytes in vivo. **J. CLIN. INVEST** 93 [3], 1298-1306 (1994).
332. TAKEOKA, M., Ward, W.F., Pollack, H. *et al.* KGF facilitates repair of radiation-induced DNA damage in alveolar epithelial cells. **AM. J. PHYSIOL** 272 [6 Pt 1], L1174-L1180 (1997).
333. GALIACY, S., Planus, E., Lepetit, H. *et al.* Keratinocyte growth factor promotes cell motility during alveolar epithelial repair in vitro. **EXP. CELL RES.** 283 [2], 215-229 (2003).
334. LIAO, M.J., Zhang, C.C., Zhou, B. *et al.* Enrichment of a population of mammary gland cells that form mammospheres and have in vivo repopulating activity. **CANCER RES.** 67 [17], 8131-8138 (2007).
335. BEER, H.D., Gassmann, M.G., Munz, B. *et al.* Expression and function of keratinocyte growth factor and activin in skin morphogenesis and cutaneous wound repair. **J. INVESTIG. DERMATOL. SYMP. PROC.** 5 [1], 34-39 (2000).
336. BRAUN, S., Krampert, M., Bodo, E. *et al.* Keratinocyte growth factor protects epidermis and hair follicles from cell death induced by UV irradiation, chemotherapeutic or cytotoxic agents. **J. CELL SCI.** 119 [Pt 23], 4841-4849 (2006).
337. FRANK, S., Munz, B., and Werner, S. The human homologue of a bovine non-selenium glutathione peroxidase is a novel keratinocyte growth factor-regulated gene. **ONCOGENE** 14 [8], 915-921 (1997).
338. BUCKLEY, S., Barsky, L., Driscoll, B. *et al.* Apoptosis and DNA damage in type 2 alveolar epithelial cells cultured from hyperoxic rats. **AM. J. PHYSIOL** 274 [5 Pt 1], L714-L720 (1998).
339. ROYCE, L.S., Kibbey, M.C., Mertz, P. *et al.* Human neoplastic submandibular intercalated duct cells express an acinar phenotype when cultured on a basement membrane matrix. **DIFFERENTIATION** 52 [3], 247-255 (1993).
340. RADTKE, M.L. and Kolesar, J.M. Palifermin (Kepivance) for the treatment of oral mucositis in patients with hematologic malignancies requiring hematopoietic stem cell support. **J. ONCOL. PHARM. PRACT.** 11 [3], 121-125 (2005).
341. HILLE, A., Rave-Frank, M., Pradier, O. *et al.* Effect of keratinocyte growth factor on the proliferation, clonogenic capacity and colony size of human epithelial tumour cells in vitro. **INT. J. RADIAT. BIOL.** 79 [2], 119-128 (2003).
342. NING, S., Shui, C., Khan, W.B. *et al.* Effects of keratinocyte growth factor on the proliferation and radiation survival of human squamous cell carcinoma cell lines in vitro and in vivo. **INT. J. RADIAT. ONCOL. BIOL. PHYS.** 40 [1], 177-187 (1998).
343. THULA, T.T., Schultz, G., Tran-Son-Tay, R. *et al.* Effects of EGF and bFGF on irradiated parotid glands. **ANN. BIOMED. ENG** 33 [5], 685-695 (2005).
344. KRAUSE, D.S., Theise, N.D., Collector, M.I. *et al.* Multi-organ, multi-lineage engraftment by a single bone marrow-derived stem cell. **CELL** 105 [3], 369-377 (2001).
345. HARRIS, R.G., Herzog, E.L., Bruscia, E.M. *et al.* Lack of a fusion requirement for development of bone marrow-derived epithelia. **SCIENCE** 305 [5680], 90-93 (2004).
346. IANUS, A., Holz, G.G., Theise, N.D. *et al.* In vivo derivation of glucose-competent pancreatic endocrine cells from bone marrow without evidence of cell fusion. **J. CLIN. INVEST** 111 [6], 843-850 (2003).
347. CAMARGO, F.D., Finegold, M., and Goodell, M.A. Hematopoietic myelomonocytic cells are the major source of hepatocyte fusion partners. **J. CLIN. INVEST** 113 [9], 1266-1270 (2004).

348. VASSILOPOULOS, G., Wang, P.R., and Russell, D.W. Transplanted bone marrow regenerates liver by cell fusion. **NATURE** 422 [6934], 901-904 (2003).
349. WANG, X., Willenbring, H., Akkari, Y. *et al.* Cell fusion is the principal source of bone-marrow-derived hepatocytes. **NATURE** 422 [6934], 897-901 (2003).
350. WILLENBRING, H., Bailey, A.S., Foster, M. *et al.* Myelomonocytic cells are sufficient for therapeutic cell fusion in liver. **NAT. MED.** 10 [7], 744-748 (2004).
351. LEE, V.M. and Stoffel, M. Bone marrow: an extra-pancreatic hideout for the elusive pancreatic stem cell? **J. CLIN. INVEST** 111 [6], 799-801 (2003).
352. RATAJCZAK, M.Z., Kucia, M., Reca, R. *et al.* Stem cell plasticity revisited: CXCR4-positive cells expressing mRNA for early muscle, liver and neural cells 'hide out' in the bone marrow. **LEUKEMIA** 18 [1], 29-40 (2004).
353. MEZEY, E., Key, S., Vogelsang, G. *et al.* Transplanted bone marrow generates new neurons in human brains. **PROC. NATL. ACAD. SCI. U. S. A** 100 [3], 1364-1369 (2003).
354. JIANG, Y., Jahagirdar, B.N., Reinhardt, R.L. *et al.* Pluripotency of mesenchymal stem cells derived from adult marrow. **NATURE** 418 [6893], 41-49 (2002).
355. SCHWARTZ, R.E., Reyes, M., Koodie, L. *et al.* Multipotent adult progenitor cells from bone marrow differentiate into functional hepatocyte-like cells. **J. CLIN. INVEST** 109 [10], 1291-1302 (2002).
356. BURLAGE, F.R., Roesink, J.M., Faber, H. *et al.* Optimum dose range for the amelioration of long term radiation-induced hyposalivation using prophylactic pilocarpine treatment. **RADIOTHER. ONCOL.** (2007).
357. STEINBERG, Z., Myers, C., Heim, V.M. *et al.* FGFR2b signaling regulates ex vivo submandibular gland epithelial cell proliferation and branching morphogenesis. **DEVELOPMENT** 132 [6], 1223-1234 (2005).
358. BOBIS, S., Jarocho, D., and Majka, M. Mesenchymal stem cells: characteristics and clinical applications. **FOLIA HISTOCHEM. CYTOBIOL.** 44 [4], 215-230 (2006).
359. DELORME, B., Chateauvieux, S., and Charbord, P. The concept of mesenchymal stem cells. **REGEN. MED.** 1 [4], 497-509 (2006).
360. YEOH, J.S., van, O.R., Weersing, E. *et al.* Fibroblast growth factor-1 and -2 preserve long-term repopulating ability of hematopoietic stem cells in serum-free cultures. **STEM CELLS** 24 [6], 1564-1572 (2006).
361. HENG, B.C., Haider, H.K., and Cao, T. Combining transfusion of stem/progenitor cells into the peripheral circulation with localized transplantation in situ at the site of tissue/organ damage: a possible strategy to optimize the efficacy of stem cell transplantation therapy. **MED. HYPOTHESES** 65 [3], 494-497 (2005).
362. MOHLE, R. and Kanz, L. Hematopoietic growth factors for hematopoietic stem cell mobilization and expansion. **SEMIN. HEMATOL.** 44 [3], 193-202 (2007).
363. NERVI, B., Link, D.C., and DiPersio, J.F. Cytokines and hematopoietic stem cell mobilization. **J. CELL BIOCHEM.** 99 [3], 690-705 (2006).
364. RIZZO, S., Attard, G., and Hudson, D.L. Prostate epithelial stem cells. **CELL PROLIF.** 38 [6], 363-374 (2005).
365. CORTI, S., Nizzardo, M., Nardini, M. *et al.* Isolation and characterization of murine neural stem/progenitor cells based on Prominin-1 expression. **EXP. NEUROL.** 205 [2], 547-562 (2007).
366. BAUM, B.J. and O'Connell, B.C. In vivo gene transfer to salivary glands. **CRIT. REV. ORAL BIOL. MED.** 10 [3], 276-283 (1999).