self-renewal and tumorigenicity [113]. These findings suggest that miRNAs may regulate these GCSC properties through EMT induction. Multidrug resistance (MDR) is also a characteristic of CSCs. Previous studies have shown that miR-15b and miR-16 may play roles in the development of MDR in GC cells by targeting BCL2, while miR-106a may promote MDR in GC cells by targeting RUNX3 [114, 115]. Shang et al. [116] recently used high-throughput functional screening to identify 11 candidate miRNAs that regulated MDR in GC, and found that among these miRNAs, miR-508-5p reversed MDR most efficiently by targeting ABCB1 and zinc ribbon-domain-containing 1.

Kong et al., revealed that inflammation could affect miRNA expression, and that down-regulation of the tumor suppressor miR-7 represented a novel mechanism whereby the inflammatory response promoted gastric tumorigenesis in K19-C2mE and K19-Wnt1/C2mE mouse models [117]. We revealed that infiltrated macrophages in the tumor microenvironment may contribute to redox adaptation through CD44 up-regulation by miR-328 suppression [118]. Sugihara et al. [119] found that TAMs down-regulated miR-30e*, which suppressed Bmi1 expression by targeting the Bmi1 3′UTR in GCs. These findings suggest that inflammation and stromal cells in the tumor microenvironment are deeply implicated in the regulation of miRNA expression in GC cells. Some miRNAs are down-regulated in GC by methylation of the CpG islands in their promoters [120]. However, many factors can affect miRNA expression, and although the methylation of CpG islands is one of these factors, the mechanisms of miRNA methylation remain largely unknown. Further studies are, therefore, needed to determine the pivotal factors affecting miRNA expression in GC cells.

Future perspectives

Solid tumors are known to exhibit hierarchical organization involving CSCs and non-CSCs. However, a recent study has indicated that this hierarchy may be reversible through epigenetic gene regulation [121], suggesting that therapeutic strategies targeting CSCs themselves might be insufficient to exterminate cancer cells. Numerous lines of evidence presented in this review indicate that the tumor microenvironment surrounding GCSCs plays a critical role in maintaining the properties of GCSCs. Targeting the unique molecules in the tumor microenvironment and their signaling interactions may, thus, be a promising therapeutic strategy, and may provide a complementary approach to conventional therapies targeting the malignant cells themselves. Further understanding of the precise molecular mechanisms regulating cancer-stromal cell interactions may lead to the development of novel treatment strategies for patients with GC.

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. CA Cancer J Clin. 2005;55(2):74–108.
2. Hohenberger P, Gretschel S. Gastric cancer. Lancet. 2003; 362(9380):305–15.
3. Clarke MF, Fuller M. Stem cells and cancer: two faces of eve. Cell. 2006;124(6):1111–5.
4. Jordan CT, Guzman ML, Noble M. Cancer stem cells. N Engl J Med. 2006;355(12):1253–61.
5. Visvader JE, Lindeman GJ. Cancer stem cells: current status and evolving complexities. Cell Stem Cell. 2012;10(6):717–28.
6. Furth J, Kahn M. The transmission of leukaemia of mice with a single cell. Am J Cancer. 1937;31:276–82.
7. Bonnet D, Dick JE. Human acute myeloid leukemia is organized as a hierarchy that originates from a primitive hematopoietic cell. Nat Med. 1997;3(7):730–7.
8. Al-Hajj M, Wicha MS, Benito-Hernandez A, et al. Prospective identification of tumorigenic breast cancer cells. Proc Natl Acad Sci USA. 2003;100(7):3983–8.
9. Singh SK, Clarke ID, Terasaki M, et al. Identification of a cancer stem cell in human brain tumors. Cancer Res. 2003; 63(18):5821–8.
10. Ricci-Vitiani L, Lombardi DG, Pilozzi E, et al. Identification and expansion of human colon-cancer-initiating cells. Nature. 2007;445(7123):111–5.
11. Xu G, Shen J, Ou Yang X, et al. Cancer stem cells: the 'heartbeat' of gastric cancer. J Gastroenterol. 2013;48(7): 781–97.
12. Mueller MM, Fusenig NE. Friends or foes—bipolar effects of the tumour stroma in cancer. Nat Rev Cancer. 2004;4(11): 839–49.
13. Liotta LA, Kohn EC. The microenvironment of the tumour-host interface. Nature. 2001;411(6835):375–9.
14. Takaishi S, Okumura T, Tu S, et al. Identification of gastric cancer stem cells using the cell surface marker CD44. Stem Cells. 2009;27(5):1006–20.
15. Zhang C, Li C, He F, et al. Identification of CD44+CD24+ gastric cancer stem cells. J Cancer Res Clin Oncol. 2011; 137(11):1679–86.
16. Chen T, Yang K, Yu J, et al. Identification and expansion of cancer stem cells in tumor tissues and peripheral blood derived from gastric adenocarcinoma patients. Cell Res. 2012;22(1): 248–58.
17. Han ME, Jeon TY, Hwang SH, et al. Cancer spheres from gastric cancer patients provide an ideal model system for cancer stem cell research. Cell Mol Life Sci. 2011;68(21):3589–605.
18. Katsuno Y, Ehata S, Yashiro M, et al. Coordinated expression of REG4 and aldehyde dehydrogenase 1 regulating tumourigenic capacity of diffuse-type gastric carcinoma-initiating cells is inhibited by TGF-beta. J Pathol. 2012;228(3):391–404.
19. Liu J, Ma L, Xu J, et al. Spheroid body-forming cells in the human gastric cancer cell line MKN-45 possess cancer stem cell properties. Int J Oncol. 2013;42(2):453–9.
20. Jiang J, Zhang Y, Chuai S, et al. Trastuzumab (herceptin) targets gastric cancer stem cells characterized by CD90 phenotype. Oncogene. 2012;31(6):671–82.
21. Ohkuma M, Haraguchi N, Ishii H, et al. Absence of CD71 transferrin receptor characterizes human gastric adenosquamous carcinoma stem cells. Ann Surg Oncol. 2012;19(4):1357–64.
22. Jiang Y, He Y, Li H, et al. Expressions of putative cancer stem cell markers ABCB1, ABCG2, and CD133 are correlated with

the degree of differentiation of gastric cancer. Gastric Cancer. 2012;15(4):440–50.
23. Hashimoto K, Aoyagi K, Isobe T, et al. Expression of CD133 in the cytoplasm is associated with cancer progression and poor prognosis in gastric cancer. Gastric Cancer. 2014;17(1):97–106.
24. Ishimoto T, Nagano O, Yae T, et al. CD44 variant regulates redox status in cancer cells by stabilizing the xCT subunit of system xc(−) and thereby promotes tumor growth. Cancer Cell. 2011;19(3):387–400.
25. Nagano O, Okazaki S, Saya H. Redox regulation in stem-like cancer cells by CD44 variant isoforms. Oncogene. 2013;32(44): 5191–8.
26. Orimo A, Gupta PB, Sgroi DC, et al. Stromal fibroblasts present in invasive human breast carcinomas promote tumor growth and angiogenesis through elevated SDF-1/CXCL12 secretion. Cell. 2005;121(3):335–48.
27. Joyce JA, Pollard JW. Microenvironmental regulation of metastasis. Nat Rev Cancer. 2009;9(4):239–52.
28. Guo X, Oshima H, Kitmura T, et al. Stromal fibroblasts activated by tumor cells promote angiogenesis in mouse gastric cancer. J Biol Chem. 2008;283(28):19864–71.
29. Worthley DL, Ruszkiewicz A, Davies R, et al. Human gastrointestinal neoplasia-associated myofibroblasts can develop from bone marrow-derived cells following allogeneic stem cell transplantation. Stem Cells. 2009;27(6):1463–8.
30. Quante M, Tu SP, Tomita H, et al. Bone marrow-derived myofibroblasts contribute to the mesenchymal stem cell niche and promote tumor growth. Cancer Cell. 2011;19(2):257–72.
31. Shibata W, Ariyama H, Westphalen CB, et al. Stromal cell-derived factor-1 overexpression induces gastric dysplasia through expansion of stromal myofibroblasts and epithelial progenitors. Gut. 2013;62(2):192–200.
32. Komohara Y, Ohnishi K, Kuratsu J, Takeya M. Possible involvement of the M2 anti-inflammatory macrophage phenotype in growth of human gliomas. J Pathol. 2008;216(1):15–24.
33. Hasita H, Komohara Y, Okabe H, et al. Significance of alternatively activated macrophages in patients with intrahepatic cholangiocarcinoma. Cancer Sci. 2010;101(8):1913–9.
34. Sica A, Mantovani A. Macrophage plasticity and polarization: in vivo veritas. J Clin Invest. 2012;122(3):787–95.
35. De Palma M, Lewis CE. Macrophage regulation of tumor responses to anticancer therapies. Cancer Cell. 2013;23(3): 277–86.
36. Ohta M, Kitadai Y, Tanaka S, et al. Monocyte chemoattractant protein-1 expression correlates with macrophage infiltration and tumor vascularity in human gastric carcinomas. Int J Oncol. 2003;22(4):773–8.
37. Kuroda T, Kitadai Y, Tanaka S, et al. Monocyte chemoattractant protein-1 transfection induces angiogenesis and tumorigenesis of gastric carcinoma in nude mice via macrophage recruitment. Clin Cancer Res. 2005;11(21):7629–36.
38. Wu H, Xu JB, He YL, et al. Tumor-associated macrophages promote angiogenesis and lymphangiogenesis of gastric cancer. J Surg Oncol. 2012;106(4):462–8.
39. Oshima H, Matsunaga A, Fujimura T, et al. Carcinogenesis in mouse stomach by simultaneous activation of the Wnt signaling and prostaglandin E2 pathway. Gastroenterology. 2006;131(4): 1086–95.
40. Oguma K, Oshima H, Aoki M, et al. Activated macrophages promote Wnt signalling through tumour necrosis factor-alpha in gastric tumour cells. EMBO J. 2008;27(12):1671–81.
41. Yamanaka N, Morisaki T, Nakashima H, et al. Interleukin 1beta enhances invasive ability of gastric carcinoma through nuclear factor-kappaB activation. Clin Cancer Res. 2004;10(5):1853–9.
42. Cardoso AP, Pinto ML, Pinto AT et al (2013) Macrophages stimulate gastric and colorectal cancer invasion through EGFR Y, c-Src, Erk1/2 and Akt phosphorylation and smallGTPase activity. Oncogene.
43. Zhuang Y, Peng LS, Zhao YL, et al. Increased intratumoral IL-22-producing CD4(+) T cells and Th22 cells correlate with gastric cancer progression and predict poor patient survival. Cancer Immunol Immunother. 2012;61(11):1965–75.
44. Zhuang Y, Peng LS, Zhao YL, et al. CD8(+) T cells that produce interleukin-17 regulate myeloid-derived suppressor cells and are associated with survival time of patients with gastric cancer. Gastroenterology. 2012;143(4):951 e8–962 e8.
45. Leedham SJ, Brittan M, Preston SL, et al. The stomach periglandular fibroblast sheath: all present and correct. Gut. 2006;55(2):295–6.
46. Hoffmann W. Stem cells, self-renewal and cancer of the gastric epithelium. Curr Med Chem. 2012;19(35):5975–83.
47. Li L, Neaves WB. Normal stem cells and cancer stem cells: the niche matters. Cancer Res. 2006;66(9):4553–7.
48. Visvader JE, Lindeman GJ. Cancer stem cells in solid tumours: accumulating evidence and unresolved questions. Nat Rev Cancer. 2008;8(10):755–68.
49. Boral D, Nie D. Cancer stem cells and niche mircoenvironments. Front Biosci. 2012;4:2502–14.
50. Yi SY, Hao YB, Nan KJ, Fan TL. Cancer stem cells niche: a target for novel cancer therapeutics. Cancer Treat Rev. 2013;39(3):290–6.
51. Borovski T, De Sousa EMF, Vermeulen L, Medema JP. Cancer stem cell niche: the place to be. Cancer Res. 2011;71(3):634–9.
52. Hasegawa T, Yashiro M, Nishii T et al (2013) Cancer-associated fibroblasts might sustain the stemness of scirrhous gastric cancer cells via transforming growth factor-beta signaling. Int J Cancer: Journal international du cancer.
53. Soeda A, Park M, Lee D, et al. Hypoxia promotes expansion of the CD133-positive glioma stem cells through activation of HIF-1alpha. Oncogene. 2009;28(45):3949–59.
54. Ma Y, Liang D, Liu J, et al. Prostate cancer cell lines under hypoxia exhibit greater stem-like properties. PLoS One. 2011;6(12):e29170.
55. Yeung TM, Gandhi SC, Bodmer WF. Hypoxia and lineage specification of cell line-derived colorectal cancer stem cells. Proc Natl Acad Sci USA. 2011;108(11):4382–7.
56. Liang D, Ma Y, Liu J, et al. The hypoxic microenvironment upgrades stem-like properties of ovarian cancer cells. BMC Cancer. 2012;12:201.
57. Liu L, Ning X, Sun L, et al. Hypoxia-inducible factor-1 alpha contributes to hypoxia-induced chemoresistance in gastric cancer. Cancer Sci. 2008;99(1):121–8.
58. Kato Y, Yashiro M, Fuyuhiro Y, et al. Effects of acute and chronic hypoxia on the radiosensitivity of gastric and esophageal cancer cells. Anticancer Res. 2011;31(10):3369–75.
59. Matsuoka J, Yashiro M, Doi Y, et al. Hypoxia stimulates the EMT of gastric cancer cells through autocrine TGFbeta signaling. PloS One. 2013;8(5):e62310.
60. Deng B, Zhu JM, Wang Y, et al. Intratumor hypoxia promotes immune tolerance by inducing regulatory T cells via TGF-beta1 in gastric cancer. PLoS One. 2013;8(5):e63777.
61. Matsumoto K, Arao T, Tanaka K, et al. mTOR signal and hypoxia-inducible factor-1 alpha regulate CD133 expression in cancer cells. Cancer Res. 2009;69(18):7160–4.
62. Calabrese C, Poppleton H, Kocak M, et al. A perivascular niche for brain tumor stem cells. Cancer Cell. 2007;11(1):69–82.
63. Ritchie KE, Nor JE. Perivascular stem cell niche in head and neck cancer. Cancer Lett. 2013;338(1):41–6.
64. Ohtsu A, Shah MA, Van Cutsem E, et al. Bevacizumab in combination with chemotherapy as first-line therapy in advanced gastric cancer: a randomized, double-blind, placebo-controlled phase III study. J Clin Oncol. 2011;29(30):3968–76.

65. Singh R, Kim WJ, Kim PH, Hong HJ. Combined blockade of HER2 and VEGF exerts greater growth inhibition of HER2-overexpressing gastric cancer xenografts than individual blockade. Exp Mol Med. 2013;45:e52.
66. Maniotis AJ, Folberg R, Hess A, et al. Vascular channel formation by human melanoma cells in vivo and in vitro: vasculogenic mimicry. Am J Pathol. 1999;155(3):739–52.
67. Shirakawa K, Kobayashi H, Heike Y, et al. Hemodynamics in vasculogenic mimicry and angiogenesis of inflammatory breast cancer xenograft. Cancer Res. 2002;62(2):560–6.
68. Millimaggi D, Mari M, D' Ascenzo S, et al. Vasculogenic mimicry of human ovarian cancer cells: role of CD147. Int J Oncol. 2009;35(6):1423–8.
69. Liu Z, Sun B, Qi L, et al. Zinc finger E-box binding homeobox 1 promotes vasculogenic mimicry in colorectal cancer through induction of epithelial-to-mesenchymal transition. Cancer Sci. 2012;103(4):813–20.
70. Wu S, Yu L, Wang D, et al. Aberrant expression of CD133 in non-small cell lung cancer and its relationship to vasculogenic mimicry. BMC Cancer. 2012;12:535.
71. Yao XH, Ping YF, Bian XW. Contribution of cancer stem cells to tumor vasculogenic mimicry. Protein Cell. 2011;2(4):266–72.
72. Liu TJ, Sun BC, Zhao XL, et al. CD133+ cells with cancer stem cell characteristics associates with vasculogenic mimicry in triple-negative breast cancer. Oncogene. 2013;32(5):544–53.
73. Cao Z, Bao M, Miele L, et al. Tumour vasculogenic mimicry is associated with poor prognosis of human cancer patients: a systemic review and meta-analysis. Eur J Cancer. 2013;49(18):3914–23.
74. Li M, Gu Y, Zhang Z, et al. Vasculogenic mimicry: a new prognostic sign of gastric adenocarcinoma. Pathol Oncol Res. 2010;16(2):259–66.
75. Jiang J, Liu W, Guo X, et al. IRX1 influences peritoneal spreading and metastasis via inhibiting BDKRB2-dependent neovascularization on gastric cancer. Oncogene. 2011;30(44):4498–508.
76. Clevers H. Wnt breakers in colon cancer. Cancer cell. 2004;5(1):5–6.
77. Sashikawa Kimura M, Mutoh H, Sugano K. SOX9 is expressed in normal stomach, intestinal metaplasia, and gastric carcinoma in humans. J Gastroenterol. 2011;46(11):1292–9.
78. Ji W, Jiang Z. Effect of shRNA-mediated inhibition of Nanog gene expression on the behavior of human gastric cancer cells. Oncol Lett. 2013;6(2):367–74.
79. Hutz K, Mejias-Luque R, Farsakova K et al (2014) The stem cell factor SOX2 regulates the tumorigenic potential in human gastric cancer cells. Carcinogenesis.
80. Tlsty TD. Stromal cells can contribute oncogenic signals. Semin Cancer Biol. 2001;11(2):97–104.
81. De Wever O, Mareel M. Role of tissue stroma in cancer cell invasion. J Pathol. 2003;200(4):429–47.
82. Lin SA, Barker N. Gastrointestinal stem cells in self-renewal and cancer. J Gastroenterol. 2011;46(9):1039–55.
83. Schepers AG, Snippert HJ, Stange DE, et al. Lineage tracing reveals Lgr5+ stem cell activity in mouse intestinal adenomas. Science. 2012;337(6095):730–5.
84. Polakis P. The many ways of Wnt in cancer. Curr Opin Genet Dev. 2007;17(1):45–51.
85. Katoh M, Kirikoshi H, Terasaki H, Shiokawa K. WNT2B2 mRNA, up-regulated in primary gastric cancer, is a positive regulator of the WNT-beta-catenin-TCF signaling pathway. Biochem Biophy Res Commun. 2001;289(5):1093–8.
86. Clements WM, Wang J, Sarnaik A, et al. beta-Catenin mutation is a frequent cause of Wnt pathway activation in gastric cancer. Cancer Res. 2002;62(12):3503–6.
87. Nabais S, Machado JC, Lopes C, et al. Patterns of beta-catenin expression in gastric carcinoma: clinicopathological relevance and mutation analysis. Int J Surg Pathol. 2003;11(1):1–9.
88. Kurayoshi M, Oue N, Yamamoto H, et al. Expression of Wnt-5a is correlated with aggressiveness of gastric cancer by stimulating cell migration and invasion. Cancer Res. 2006;66(21):10439–48.
89. Yanai K, Nakamura M, Akiyoshi T, et al. Crosstalk of hedgehog and Wnt pathways in gastric cancer. Cancer Lett. 2008;263(1):145–56.
90. de Sousa EM, Vermeulen L, Richel D, Medema JP. Targeting Wnt signaling in colon cancer stem cells. Clin Cancer Res. 2011;17(4):647–53.
91. Cai C, Zhu X. The Wnt/beta-catenin pathway regulates self-renewal of cancer stem-like cells in human gastric cancer. Mol Med Rep. 2012;5(5):1191–6.
92. Ishimoto T, Oshima H, Oshima M, et al. CD44+ slow-cycling tumor cell expansion is triggered by cooperative actions of Wnt and prostaglandin E2 in gastric tumorigenesis. Cancer Sci. 2010;101(3):673–8.
93. Lewis J. Notch signalling and the control of cell fate choices in vertebrates. Semin Cell Dev Biol. 1998;9(6):583–9.
94. Burns CE, Traver D, Mayhall E, Shepard JL, Zon LI. Hematopoietic stem cell fate is established by the Notch-Runx pathway. Genes Dev. 2005;19(19):2331–42.
95. Fre S, Huyghe M, Mourikis P, et al. Notch signals control the fate of immature progenitor cells in the intestine. Nature. 2005;435(7044):964–8.
96. Nickoloff BJ, Osborne BA, Miele L. Notch signaling as a therapeutic target in cancer: a new approach to the development of cell fate modifying agents. Oncogene. 2003;22(42):6598–608.
97. Fan X, Matsui W, Khaki L, et al. Notch pathway inhibition depletes stem-like cells and blocks engraftment in embryonal brain tumors. Cancer Res. 2006;66(15):7445–52.
98. Jundt F, Schwarzer R, Dorken B. Notch signaling in leukemias and lymphomas. Curr Mol Med. 2008;8(1):51–9.
99. Yeh TS, Wu CW, Hsu KW, et al. The activated Notch1 signal pathway is associated with gastric cancer progression through cyclooxygenase-2. Cancer Res. 2009;69(12):5039–48.
100. Piazzi G, Fini L, Selgrad M, et al. Epigenetic regulation of Delta-Like1 controls Notch1 activation in gastric cancer. Oncotarget. 2011;2(12):1291–301.
101. Fukaya M, Isohata N, Ohta H, et al. Hedgehog signal activation in gastric pit cell and in diffuse-type gastric cancer. Gastroenterology. 2006;131(1):14–29.
102. Martin J, Donnelly JM, Houghton J, Zavros Y. The role of sonic hedgehog reemergence during gastric cancer. Dig Dis Sci. 2010;55(6):1516–24.
103. Yoo YA, Kang MH, Kim JS, Oh SC. Sonic hedgehog signaling promotes motility and invasiveness of gastric cancer cells through TGF-beta-mediated activation of the ALK5-Smad 3 pathway. Carcinogenesis. 2008;29(3):480–90.
104. Yoo YA, Kang MH, Lee HJ, et al. Sonic hedgehog pathway promotes metastasis and lymphangiogenesis via activation of Akt, EMT, and MMP-9 pathway in gastric cancer. Cancer Res. 2011;71(22):7061–70.
105. Song Z, Yue W, Wei B, et al. Sonic hedgehog pathway is essential for maintenance of cancer stem-like cells in human gastric cancer. PloS One. 2011;6(3):e17687.
106. Zhang B, Pan X, Cobb GP, Anderson TA. microRNAs as oncogenes and tumor suppressors. Dev Biol. 2007;302(1):1–12.
107. Kong YW, Ferland-McCollough D, Jackson TJ, Bushell M. microRNAs in cancer management. Lancet Oncol. 2012;13(6):e249–58.

108. Ueda T, Volinia S, Okumura H, et al. Relation between microRNA expression and progression and prognosis of gastric cancer: a microRNA expression analysis. Lancet Oncol. 2010;11(2):136–46.
109. Zheng B, Liang L, Wang C, et al. MicroRNA-148a suppresses tumor cell invasion and metastasis by downregulating ROCK1 in gastric cancer. Clin Cancer Res. 2011;17(24):7574–83.
110. Gao P, Xing AY, Zhou GY, et al. The molecular mechanism of microRNA-145 to suppress invasion-metastasis cascade in gastric cancer. Oncogene. 2013;32(4):491–501.
111. Kurashige J, Kamohara H, Watanabe M, et al. MicroRNA-200b regulates cell proliferation, invasion, and migration by directly targeting ZEB2 in gastric carcinoma. Ann Surg Oncol. 2012;19(Suppl 3):S656–64.
112. Song F, Yang D, Liu B et al (2013) Integrated microRNA network analyses identify a poor-prognosis subtype of gastric cancer characterized by the miR-200 family. Clin Cancer Res.
113. Mani SA, Guo W, Liao MJ, et al. The epithelial-mesenchymal transition generates cells with properties of stem cells. Cell. 2008;133(4):704–15.
114. Xia L, Zhang D, Du R, et al. miR-15b and miR-16 modulate multidrug resistance by targeting BCL2 in human gastric cancer cells. Int J Cancer: Journal international du cancer. 2008;123(2):372–9.
115. Zhang Y, Lu Q, Cai X. MicroRNA-106a induces multidrug resistance in gastric cancer by targeting RUNX3. FEBS Lett. 2013;587(18):3069–75.
116. Shang Y, Zhang Z, Liu Z et al (2013) miR-508-5p regulates multidrug resistance of gastric cancer by targeting ABCB1 and ZNRD1. Oncogene.
117. Kong D, Piao YS, Yamashita S, et al. Inflammation-induced repression of tumor suppressor miR-7 in gastric tumor cells. Oncogene. 2012;31(35):3949–60.
118. Ishimoto T, Sugihara H, Watanabe M et al (2013) Macrophage-derived reactive oxygen species suppress miR-328 targeting CD44 in cancer cells and promote redox adaptation. Carcinogenesis.
119. Sugihara H, Ishimoto T, Watanabe M, et al. Identification of miR-30e* regulation of Bmi1 expression mediated by tumor-associated macrophages in gastrointestinal cancer. PloS One. 2013;8(11):e81839.
120. Ma J, Hong L, Chen Z et al (2013) Epigenetic regulation of microRNAs in gastric cancer. Dig Dis Sci.
121. Roesch A, Fukunaga-Kalabis M, Schmidt EC, et al. A temporarily distinct subpopulation of slow-cycling melanoma cells is required for continuous tumor growth. Cell. 2010;141(4):583–94.