

Table SIII. circRNAs promote the expression and stability of IGF1R by regulating miRNAs.

circRNAs	miRNAs	Functions in cancer progression
Circ_0006174	miR-940	Circ_0006174 enhances radioresistance and tumorigenesis in colorectal cancer by acting as a ceRNA for miR-940, leading to upregulated IGF1R expression. Silencing circ_0006174 sensitizes CRC cells to radiation and suppresses tumor growth both <i>in vitro</i> and <i>in vivo</i> (75).
Circ_PPAPDC1A	miR-30a-3p	Circ_PPAPDC1A drives osimertinib resistance in NSCLC by sequestering miR-30a-3p to upregulate IGF1R and activate the PI3K/AKT/mTOR pathway. Targeting this circRNA reverses therapeutic resistance and presents a potential strategy for resistant NSCLC management (76).
Circ-IGF1R	miR-362-5p	Circ-IGF1R promotes CRC progression by functioning as a ceRNA that sequesters miR-362-5p, leading to HMGB3 upregulation and subsequent activation of the Wnt/ β -catenin signaling pathway. This circRNA-mediated regulatory axis enhances tumor growth, metastasis and glycolytic metabolism, suggesting its potential as both a diagnostic biomarker and therapeutic target in CRC (77).
CircVAPA	miR-377-3p miR-494-3p	CircVAPA drives small cell lung cancer progression through dual sponging of miR-377-3p and miR-494-3p, resulting in IGF1R upregulation and subsequent activation of the PI3K/AKT signaling pathway. Targeting this circRNA enhances the efficacy of IGF1R inhibitors, suggesting a promising combination therapeutic strategy for SCLC treatment (78).
Circ_0067835	miR-296-5p	Circ_0067835 enhances CRC radioresistance by functioning as a ceRNA that sequesters miR-296-5p, leading to increased IGF1R expression and subsequent reduction in radiation-induced apoptosis. Therapeutic targeting of this circRNA-mediated pathway represents a promising strategy to overcome radioresistance in patients with CRC (79).
CircRNF13	miR-139-5p	CircRNF13 drives pancreatic cancer progression by functioning as a molecular sponge for miR-139-5p, leading to subsequent upregulation of IGF1R expression and enhanced tumor cell proliferation, migration, and invasion. This circRNA-mediated regulatory mechanism represents a potential therapeutic target for intervention in IGF1R-driven pancreatic cancer malignancies (80).
Circ_0002577	miR-625-5p	circRNA hsa_circ_0002577 promotes endometrial cancer progression by functioning as a ceRNA that sequesters miR-625-5p, leading to IGF1R upregulation

		and subsequent activation of the PI3K/Akt signaling pathway. This circRNA-mediated regulatory mechanism represents a promising diagnostic biomarker and therapeutic target for endometrial cancer intervention (81).
CircGNB1	miR-141-5p	circGNB1 promotes TNBC progression by functioning as a competitive endogenous RNA that sequesters miR-141-5p, leading to IGF1R upregulation and enhanced tumor growth and metastasis. This circRNA-mediated regulatory mechanism represents both a potential prognostic biomarker and therapeutic target for TNBC treatment (82).
Circ_0006089	miR-143-3p	Circ_0006089 promotes gastric cancer progression by functioning as a ceRNA that sequesters miR-143-3p, leading to subsequent upregulation of IGF1R expression and enhanced tumor proliferation, migration and invasion. This circRNA-mediated regulatory axis represents a promising therapeutic target for gastric cancer intervention (83).

IGF1R, insulin-like growth factor 1 receptor; circRNA, circular RNA; miR/miRNA, microRNA; ceRNA, competing endogenous RNA; CRC, colorectal cancer; NSCLC< non-small cell lung cancer; TNBC, triple-negative breast cancer.