TABLE 1 **|** Pharmacological activity of isoliensinine

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| **Pharmacological activity** | **Model** | **Action and Mechanism** | **Ref.** |
| Anti-cancer activity | Multiple cancers (HeLa, A549, MCF-7, PC-3, Hep3B, H1299, LO2); Apoptosis- resistant cells (caspase-3/-7/-8 deficient MEFs and Bax/Bak double knockout MEFs) | Enhancers of autophagyLC3-I↑, LC3-II↑, p-AMPK↑, TSC2↑, p-P70S6K↓  | (Law, Chan et al. 2014) |
| Triple-negative human breast cancer cells (MCF-10A, MDA-MB-436, MDA-MB- 468, MDA-MB-231, MCF-7) | P21↑, CyclinE↓, Bcl-2/Bax↓, cleaved caspase-3↑, cleaved PARP-1↑, ROS↑, p-P38↑, p-JNK↑ | (Zhang, Wang et al. 2015) |
| Hepatocellular Carcinoma Cells (HepG2, Huh-7, H22); Xenografts nude mice transplanted Huh-7; Kunming mice of transplanted H22 | Bcl-2↓, Bcl-xL↓, MMP9↓, activity of caspase-3↑, activity of NF-kB↓, p-P65↓, interaction of PP2A/ I2PP2A↓ | (Shu, Yue et al. 2015, Shu, Zhang et al. 2016) |
| Hepatocellular Carcinoma Cell (HepG2, Huh-7, H22, HL-7702, Hepa1-6, Hep3B); Huh-7 xenografts Nude Mice | Chemosensitized by dauricinemiR-199a↑, HK2 ↓, PKM2↓  | (Li, Qiu et al. 2018) |
| Colorectal cancer cells (HCT-15) | Chemosensitizing activity on cisplatin, ROS↑, MMP↓,Bcl-2↓, cleaved caspase-3↑, cleaved PARP↑, Cyto C↑, p-P38↑, P38↑, PI3K↓, p-AKT↓ | (Manogaran, Beeraka et al. 2019) |
| Cardiovascular protective activity | Porcine coronary arterial smooth muscle cells | Inhibition of proliferation of porcine coronary arterial smooth muscle cells induced by angiotensin IIPDGF-β↓，bFGF↓, c-fos↓, c-myc ↓，hsp70↓ | (Xiao, Zhang et al. 2005, Xiao, Zhang et al. 2006) |
| Isolated mesenteric vascular smooth muscle | Relaxing abnormal smooth muscle contractions | (Yang, Sun et al. 2018) |
| Aortic tissues of male spontaneously hypertensive rats; Vascular smooth muscle cell (VSMCs)  | Anti-hypertension; Ameliorating aortic remodeling collagen I↓, α-SMA↑, p-MYPT1↓, ROCK↓, RhoA transposition↓ | (Li, Wo et al. 2019) |
|  | Isolated rabbit left ventricular myocytes | AntiarrhythmicI NaL↓, I CaL↓EADs↓, DADs↓ | (Liu, Hu et al. 2020) |
| Antioxidant activity | Human hepatocellular HepG2 | Anti-oxidative stressROS↓, TBARS↓, LDH ↓GSH↑ | (Xie, Zhang et al. 2013) |
| D-Galactose-induced aged mice | Anti-aging, MDA↓,SOD↑, GSH-Px↑ | (Liu SL, Hao YR et al. 2011, Shen, Jiang et al. 2017) |
| Anti-virus activity | H9 | Anti-HIV | (Kashiwada, Aoshima et al. 2005, Zhou, Jiang et al. 2007) |
| Anti-depressant activity | Mice (the forced swimming test) | Anti-immobility effects5-HT 1A receptor | (Sugimoto, Nishimura et al. 2015) |
| Improving Alzheimer’s disease activity | 96-well plate contained BChE | Inhibition of the activity of BChE | (Lin, Wang et al. 2013) |
| Anti-diabetic activity | Rat skeletal muscle cells, L6;the KK-Ay rat | GLUT4↑, p-AMPK↑, p-ACC↑, PPARγ↓, SREBP-1c↓, ACC↓ | (Yang, Huang et al. 2017) |
| Anti-pulmonary fibrosis | Male Kunming mice | MDA↓, hydroxyproline↓，ALP↓SOD↑, TGF-β1↓，TNF-α↓,MMP2↓ | (Xiao, Zhang et al. 2005) |