**Supplementary Table S1. The detail information for 13 TAMs related genes.**

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| --- | --- | --- | --- |
| **Gene ID** | **Gene name** | **Classification** | **Description** |
| **CD68** | CD68 | adhesive molecule | CD68 is a commonly used marker for macrophage regardless of their polarization(Wang et al., 2018) |
| **MRC1**  **(CD206)** | mannose receptor C-type 1 | adhesive molecule | CD206 is mainly used for the detection of polarized M2 TAMs(Lu-Emerson et al., 2013) |
| **CD163** | CD163 | scavenger receptor | CD163 is mainly used for the detection of polarized M2 TAMs(Lu-Emerson et al., 2013) |
| **ITGAM**  **(CD11b)** | integrin subunit alpha M | complement receptor | CD11b is mainly used for identification myeloid cells and regulates macrophage polarization(Lu-Emerson et al., 2013) |
| **IL10** | interleukin 10 | anti-inflammatory cytokine | play various immunosuppressive roles in TME(Cassetta and Pollard, 2018) |
| **TGFB1** | transforming growth factor beta 1 | anti-inflammatory cytokine | play various immunosuppressive roles in TME(Cassetta and Pollard, 2018) |
| **CCL17** | C-C motif chemokine ligand 17 | chemokine | immunosuppressive chemokine, recruitment for Tregs(Cassetta and Pollard, 2018) |
| **CXCL8**  **(IL8)** | C-X-C motif chemokine ligand 8 | chemokine | immunosuppressive chemokine, angiogenesis, survival signaling for cancer stem cells, recruitment for MDSCs(Cassetta and Pollard, 2018) |
| **ARG1** | arginase 1 | metabolic enzyme | arginase catalyzes the hydrolysis of arginine to ornithine and urea(Vitale et al., 2019) |
| **IDO1** | indoleamine 2,3-dioxygenase 1 | metabolic enzyme | a heme enzyme that catalyzes the first and rate-limiting step in tryptophan catabolism to N-formyl-kynurenine(Vitale et al., 2019) |
| **ENTPD1**  **(CD39)** | ectonucleoside triphosphate diphosphohydrolase 1 | metabolic enzyme | ecto-enzymes that favor extracellular adenosine accumulation(Takenaka et al., 2019) |
| **MMP14** | matrix metallopeptidase 14 | matrix metallopeptidase | promote tumor cell migration and invasion(Alonso-Herranz et al., 2020) |
| **CD274**  **(PD-L1)** | programmed death ligand 1 | immunosuppressive membrane protein | ligand of PD1, immune checkpoint molecule(Noguchi et al., 2017) |

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