**Supplementary Table 1. Relevance of TRP channel interactors in breast cancer**

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| TRP channel | Interactor | Relevance in breast cancer |
| TRPC1 | Fibroblast growth factor receptor-1 protein (FGFR1)(Fiorio Pla et al., 2005) | FGFR1 expression is associated with prognosis in ER+/HER2- primary breast cancer (Tomiguchi et al., 2016). Upregulation of EGFR signaling is correlated with tumor stroma remodelling and tumor recurrence in FGFR1-driven breast cancer (Holdman et al., 2015) |
| Caveolin1(Pani et al., 2009) | Caveolin-1 inhibits breast cancer stem cells via c-Myc-mediated metabolic reprogramming (S. Wang et al., 2020) - Src-mediated phosphorylation, ubiquitination and degradation of Caveolin-1 promotes breast cancer cell stemness (Yoon, Kim, Kim, Jang, & Surh, 2019) |
| PLC-γ(Tu, Chang, & Bikle, 2005) | PLC-γ-1 phosphorylation status is prognostic of metastatic risk in patients with early-stage Luminal-A and -B breast cancer subtypes (Lattanzio et al., 2019) |
| IP3R2 (Rosado & Sage, 2001)/IP3R3 (Yuan et al., 2003) | Downregulation of IP3R decrease breast cancer cells migration (Mound et al., 2017) - IP3R3 silencing induces actin filaments reorganization in breast cancer cells by regulation of a ARHGAP18/RhoA/mDia1/FAK pathway (Vautrin-Glabik, Botia, Kischel, Ouadid-Ahidouch, & Rodat-Despoix, 2018) |
| STIM1(J. J. López, Salido, Pariente, & Rosado, 2006) | STIM1 silencing reduces cell migration in TNBC (MDA-MB-132 and 4T1 cells) and metastasis in murine breast cancer model (Yang, Zhang, & Huang, 2009) |
| STIM2(Berna-Erro, 2012) | STIM2 leads to breast cancer metastasis via NFAT1 / TGF-β1 to promote EMT.(Miao et al., 2019). |
| ORAI1(Cheng, Liu, Ong, & Ambudkar, 2008) | ORAI1 silencing reduces cell migration in TNBC (MDA-MB-132 and 4T1 cells) and metastasis in murine breast cancer model (Yang et al., 2009) |
| ORAI3(Berna-Erro, 2012) | Orai3 is overexpressed in breast cancer tissues, participating in their proliferation, cell cycle progression and survival (Faouzi, 2011; Hasna et al., 2018).  |
| RhoA(Mehta et al., 2003) | Some studies state that RhoA prevents invasive processes (Humphries et al., 2017; Kalpana, Figy, Yeung, & Yeung, 2019) while others propose that RhoA enhances cell invasiveness and proliferation of breast cancer cells (Daubriac et al., 2018; Pillé et al., 2005) |
| PMCA(Singh, Liu, Tang, Zhu, & Ambudkar, 2002) | PMCA2 regulates breast cancer cell proliferation and sensitivity to doxorubicin (Peters et al., 2016) and promotes HER2-mediated breast cancer (Jeong et al., 2016) |
| NCS-1(Hannan, Kabbani, Paspalas, & Levenson, 2008) | NCS-1 expression is higher in basal breast cancers and regulates calcium influx and cytotoxic responses to doxorubicin (Bong, Robitaille, Milevskiy, Roberts-Thomson, & Monteith, 2020). Promotes aggressive behaviour and predicts survival of patients (Moore, England, Ehrlich, & Rimm, 2017) |
| SERCA2/ SERCA3 (Redondo, Jardin, Lopez, Salido, & Rosado, 2008) | Inhibition of SERCA by thapsigargin analogs induces cell death via ER Ca2+ depletion and the unfolded protein response (Sehgal et al., 2017) |
| FKBP4(E. López, Berna-Erro, Salido, Rosado, & Redondo, 2013; Sinkins, Goel, Estacion, & Schilling, 2004) | FKBP4 is a malignant indicator in luminal A subtype of breast cancer (Xiong et al., 2020) - FKBP4 connects mTORC2 and PI3K to activate the PDK1/Akt-dependent cell proliferation signaling in breast cancer (Mangé et al., 2019) |
| TRPC5 | Rac1(Tian et al., 2010) | Rac1 is overexpressed and activated in the plasma membrane of tumor cells in aggressive breast cancer samples (Schnelzer et al., 2000) |
| Myosin X(Goel, Sinkins, Keightley, Kinter, & Schilling, 2005) | Myosin X was found overexpressed in breast cancer tissue (Cao et al., 2014) |
| α-actinin I(Goel et al., 2005) | The loss of α-actinin I in cell contact sites of MDA-MB-231 cells promotes cell migration (Kovac, Mäkelä, & Vallenius, 2018) |
| α -actinin IV(Goel et al., 2005) | The loss of α-actinin IV in cell contact sites of MCF-7 cells promotes cell migration (Hsu & Kao, 2013) |
| Drebrin1(Goel et al., 2005) | DBN1 is an independent prognostic marker in luminal breast cancer due to its association with the response to endocrine therapy (Alfarsi et al., 2020). |
| CaMKIIβ(Puram et al., 2011) | Phosphorylation in T287 that has been described as increased in breast cancer tissue and metastasis. In vitro studies in MDA-MB-231 cells report that CaMKIIβ promotes cell invasion (Chi et al., 2016) |
| TARBP2(Zimmermann et al., 2014) | Overexpression of TARBP2 correlates with downregulation of tumor suppressors APP and ZNF395 and enhanced metastasis (Goodarzi et al., 2014). TARBP2 induces resistance to Tamoxifen in a SOX2-dependent manner in MCF-7 cells and breast tumors (M. Y. Wang et al., 2019). |
| NCS1(Hui et al., 2006) | Overexpression of NCS1 promotes migration and metastasis in MDA-MB-231 (Apasu et al., 2019). NCS1 is overexpressed in basal like breast cancer, where it acts as a poor prognosis and doxorubicin resistance biomarker (Bong et al., 2020). NCS1 has also been found positively correlated with complete response to Taxane-based chemotherapy through its direct interactions (Moore et al., 2018) |
| TRPC1(Strübing, Krapivinsky, Krapivinsky, & Clapham, 2001) | Overexpression promotes proliferation in breast cancer tissue and MCF-7 (Elzamzamy, Penner, & Hazlehurst, 2020) |
| TRPC6(Shi, Ju, Saleh, Albert, & Large, 2010) | Silencing of this protein reduces proliferation, migration and invasion in MDA-MB-231 and MCF-7 cells (Jardin et al., 2018) |
| IP3R3(Tang et al., 2001) | Its interaction with BKCa promotes proliferation in MCF-7 cells (Mound, Rodat-Despoix, Bougarn, Ouadid-Ahidouch, & Matifat, 2013) |
| STIM1(Yuan, Zeng, Huang, Worley, & Muallem, 2007) | Overexpression promotes metastasis in triple negative breast cancer cells (MDA-MB-132 and 4T1 cells) (Yang et al., 2009) |
| Stathmin1(Greka, Navarro, Oancea, Duggan, & Clapham, 2003) | High levels of this protein show enhanced proliferation, angiogenesis and immune response evasion, mainly in basal like subtypes of breast cancer (Askeland et al., 2020). Stathmin1 correlates with poor prognosis for breast cancer patients (Askeland et al., 2020) |
| TRPC6 | BKCa (E. Y. Kim, Alvarez-Baron, & Dryer, 2009) | Metastatic breast cancer cells exhibit increased BKCa channel activity, leading to greater invasiveness and transendothelial migration, both of which could be attenuated by blocking BKCa.(Khaitan et al., 2009) |
| Fyn (Hisatsune et al., 2004) | FYN promotes breast cancer progression through epithelial-mesenchymal transition (Y. G. Xie et al., 2016) |
| Src (Hisatsune et al., 2004) | Screening a spectrum of breast cancer cell lines with dasatinib highlighted preferential sensitivity to Src inhibition in basal-like breast cancers. Src also plays a role in resistance of HER2+ breast cancer to the HER2-targeted antibody trastuzumab (Mayer & Krop, 2010) |
| MxA (Lussier et al., 2005) | MxA expression was higher in TNBC tumors than in other subtypes. High MxA levels are associated with a higher histologic grade and abundant tumor infiltrating lymphocytes (Y. A. Kim et al., 2016) |
| Drebrin1 (Goel et al., 2005) | DBN1 is an independent prognostic marker in luminal breast cancer due to its association with the response to endocrine therapy (Alfarsi et al., 2020). |
| TRPM4 | KCTD5(Rivas et al., 2020a) | KCTD5 mRNA is significantly upregulated in breast cancer tumors compared to normal tissue samples (Rivas et al., 2020b) |
| Calmodulin (CaM)(Nilius et al., 2005) | Modulates the NFAT and AKT pathway promoting survival, proliferation and migration in several breast cancer cell lines in a Ca2+-dependent manner (Coticchia, Revankar, Deb, Dickson, & Johnson, 2009; Deb, Coticchia, & Dickson, 2004) |
| SUR1(Woo, Kwon, Ivanov, Gerzanich, & Simard, 2013) | SUR1 is overexpressed in breast cancer (Uhlen et al., 2017).  |
| EB1(Blanco et al., 2019) | EB1 expression correlates with higher histological grade and metastasis (Dong et al., 2010). EB1 promotes the proliferation and tumorigenesis of breast cancer (Dong et al., 2010; Fujii et al., 2005; Y. Wang et al., 2005). |
| 14-3-3gamma(Cho et al., 2014) | 14-3-3γ localizes in pseudopodia of MDA-MB-231 cells and its knockdown diminishes the pseudopodia formation and cell migration (Hiraoka et al., 2019) |
| TRPC3(Park et al., 2008) | In MDA-MB-231 cells, Ca2+ influx through TRPC3 via RAS4/Ras-MAPK pathway promotes proliferation and apoptosis resistance (Y. Wang, Qi, Qi, & Tsang, 2019) |
| ENaC(E. C. Kim, Choi, Lim, Yeon, & Lee, 2013) | γENaC induces a chronic inflammatory response with a potential protumoral effect in breast cancer cell lines (Amara, Ivy, Myles, & Tiriveedhi, 2016) |
| TRPM7 | Myosin Heavy Chain IIA (MHCIIa)(Clark et al., 2006; Middelbeek et al., 2016) | MHCIIa promotes invasion and migration of breast cancer cell lines (Guilbert et al., 2013) |
| Annexin 1a(Dorovkov & Ryazanov, 2004; Zhao et al., 2015) | Annexin 1A expression is upregulated in basal-like breast cancer cell lines, regulating metastasis and TGF-ß signaling (de Graauw et al., 2010) |
| Smad2(L. Fang et al., 2014) | Smad2 phosphorylation is increased in patients, suggesting a poor prognosis of survival (de Kruijf et al., 2013) |
| TRPM8 | 5-HT 1β(Vinuela-Fernandez et al., 2014) | 5-HT receptor expression is up-regulated in the highly invasive cell line MDA-MB-231. 5-HT receptor is implicated in cell invasion and tumor growth (Gautam et al., 2016) |
| TRPV1 | Cbl (S. Li et al., 2011) | Cbl is a predictor of favourable prognosis in breast cancer (Daniels et al., 2019; W. Li et al., 2018; Liu et al., 2020; L. Xu et al., 2017) |
| EGFR (Bode et al., 2009) | EGFR is over-expressed in metastatic breast cancer and TNBC (Masuda, 2012). |
| FAF1(S. Kim et al., 2006) | A positive correlation has been observed between the survival of patients with metastasis-free breast cancer and FAF1 expression (F. Xie et al., 2017) |
| GABARAP(Laínez et al., 2010) | GABARAP has been described as a tumor suppressor in breast cancer where their mRNA and protein expression levels were significantly downregulated in invasive and ductal lobular carcinomas compared to normal breast tissue (Klebig et al., 2005) |
| TRPA1(Akopian, Ruparel, Jeske, & Hargreaves, 2007; Salas, Hargreaves, & Akopian, 2009) | TRPA1 is overexpressed in breast cancer tissue promoting tolerance to oxidative stress of tumor cells and its inhibition reduces tumor growth and improves sensitivity to chemotherapy (Takahashi et al., 2018) |
| TRPV2 | TRPV1(Hellwig, Albrecht, Harteneck, Schultz, & Schaefer, 2005; Liapi & Wood, 2005; Rutter, Ma, Leveridge, & Bonnert, 2005) | TRPV1 activity exerts an antitumoral role in breast cancer, promoting cell death (Nazıroğlu et al., 2017; Nur, Nazıroğlu, & Deveci, 2017; Weber et al., 2016) and decreased cell proliferation. |
| ACBD3(Stokes, Shimoda, Koblan-Huberson, Adra, & Turner, 2004) | ACBD3 overexpression correlates with poor prognosis in breast cancer, promoting tumorigenesis via activation of Wnt/β-catenin signalling (Huang et al., 2018) |
| TRPV4 | β-catenin/E-Cadherin(Kida et al., 2012; Sokabe, Fukumi-Tominaga, Yonemura, Mizuno, & Tominaga, 2010) | Protein complex that plays crucial roles in EMT and metastatic behaviour (Corso et al., 2020) |
| Fyn(H. Xu et al., 2003) | Fyn promotes breast cancer progression through EMT (Y. G. Xie et al., 2016) and promotes a mesenchymal phenotype in breast cancer cells (Lee et al., 2018) |
| AQP5(Liu et al., 2006) | AQP5 expression is a marker for proliferation and migration of breast cancer cells (Jung, 2011), and a prognostic marker in triple-negative breast cancer (Zhu et al., 2018) |
| Caveolin1(Ma et al., 2010) | Caveolin-1 inhibits breast cancer stem cells via c-Myc-mediated metabolic reprogramming (S. Wang et al., 2020) - Src-mediated phosphorylation, ubiquitination and degradation of Caveolin-1 promotes breast cancer cell stemness (Yoon et al., 2019) |
| TMEM16A(Takayama, Shibasaki, Suzuki, Yamanaka, & Tominaga, 2014) | TMEM16A induces EGFR-dependent signaling pathway activation and breast cancer cells proliferation and migration (Britschgi et al., 2013; H. Wang et al., 2017) |
| IP3R3(Fernandes et al., 2008; Garcia-Elias, Lorenzo, Vicente, & Valverde, 2008) | Downregulation of IP3R decrease breast cancer cells migration (Mound et al., 2017) - IP3R3 silencing induces actin filaments reorganization in breast cancer cells by regulation of a ARHGAP18/RhoA/mDia1/FAK pathway (Vautrin-Glabik et al., 2018) |
| Calmodulin(Niemeyer, Bergs, Wissenbach, Flockerzi, & Trost, 2001) | Calmodulin modulates the NFAT and AKT pathways promoting survival, proliferation and migration in several breast cancer cell lines in a Ca2+-dependent manner (Coticchia et al., 2009; Deb et al., 2004) |
| TRPV6 | Fyn(Sternfeld et al., 2007) | Fyn has been described as a predictive biomarker of tamoxifen response, participating in tamoxifen resistance (Elias et al., 2015).This protein is involved in maintaining the mesenchymal phenotype of MDA-MB-231 cells (Lee et al., 2018) |
| Src(Sternfeld et al., 2007) | Src promotes cell growth and survival in triple negative and EGFR positive breast cancer cells (MDA-MB-468), while in MCF-7 cell this protein promotes spreading and motility. Moreover, a gain of function of this protein promotes bone metastasis in mice models (Finn, 2008) |
| Numb1(S. Y. Kim et al., 2013) | The absence of Numb1 correlates with reduced disease-free survival in patients with a basal like phenotype (Rennstam et al., 2010) |
| PTEN(S. Y. Kim et al., 2014) | PTEN loss of function correlates with a more aggressive behaviour and poor prognosis for patients (S. Li et al., 2017) |
| Cyclophilin B(Stumpf et al., 2008) | Knockdown of cyclophin B in T47D cells downregulates the expression of several elements involved in cell proliferation, such as the progesterone and estrogen receptors (F. Fang, Flegler, Du, Lin, & Clevenger, 2009) |
| RGS2(Schoeber et al., 2006) | RGS2 is downregulated in MCF-7 cells but not in MCF-10A. RGS2 overexpression in MCF-7 cells reduces cell growth (Lyu et al., 2015) |
| Rab11a(van de Graaf, Hoenderop, & Bindels, 2006) | Rab11a knockdown reduces proliferation, migration, and invasion in an AKT dependent manner (W. Li, Li, Fan, & Liu, 2017) |

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