Supplemental Table 1. GEO omnibus datasets included in the study			
profiling performed, year	**GSE Accession number**	**normal pancreatic tissue**	**pancreatic cancer tissue**
Walker et al (2004)	GSE1133	2	0
Buturovic et al (2008)	GSE12630	0	9
Badea et al (2009)	GSE15471	39	39
Sadanandam et al (2009)	GSE17891	0	1
Miya et al (2009)	GSE18674	1	0
Chelala et al (2009)	GSE19279	3	9
Hiraoka et al (2009)	GSE19650	7	0
Curley et al (2004)	GSE2109	0	16
Chen et al (2010)	GSE22780	8	0
Ge et al (2005)	GSE2361	1	0
Tran et al (2011)	GSE32676	7	25
Miya et al (2011)	GSE33846	1	0
Chelala et al (2013)	GSE43288	3	4
Kaneda et al (2013)	GSE43346	1	0
Blais et al (2013)	GSE46385	3	0
Roth et al (2007)	GSE7307	1	0

Abbreviation: GSE, gene expression omnibus series; PDA, pancreatic ductal adenocarcinoma

Note: GSE accession numbers can be used to query the data set in GEO (http://www.ncbi.nlm.nih.gov/geo/).

Supplemental Table 2. Literature overview protein overexpression human samples

Rank	Gene symbol	Protein location	Protein function	Protein overexpression in human samples			Reference
				PDA	other cancers	unkown	
1	*THY1*	cell membrane	Glycolipid	●			Foygel *et al* , 2013)
2	*SEL1L*	intracellular	unkown	●			Cattaneo *et al* , 2003
3	*NPR3*	Cell membrane	GPCR			●	
4	*JUP /// KRT17*	intracellular	cytokeratin		●		Escobar-Hoyos *et al* , 2014
5	*NOX4*	cell membrane	NADPH oxidase	●			Edderkaoui *et al* , 2005; Ogrunc *et al* , 2014
6	*TM4SF1*	cell membrane	Antigen	●			Lin *et al* , 2014
7	*CLDN18*	cell membrane	Tight junction protein	●			Tanaka *et al* , 2011; Wöll *et al* , 2014; Soini *et al* , 2012
8	*CTSE*	intracellular	Protease	●			Keliher *et al* , 2013
9	*TMPRSS4*	cell membrane	Protease	●			Wallrapp *et al* , 2000
10	*GGT5*	extracellular	Protease	●			Ramsay *et al* , 2014
11	*DKK3*	extracellular	unknown	●			Fong *et al* , 2009; Uchida *et al* , 2014
12	*TINAGL1*	extracellular	Glycoprotein			●	
13	*LAMA3*	extracellular	Laminin			●	
14	*HSD17B7*	cell membrane	SDR			●	
15	*AHNAK2*	intracellular	Unkown			●	
16	*FXYD3*	cell membrane	Ion channel regulator	●			Kayed *et al* , 2006
17	*C7orf10*	intracellular	Transferase			●	
18	*GJB3*	cell membrane	Gap junction protein			●	
19	*GPRC5D*	cell membrane	GPCR			●	
20	*LAMC2*	extracellular	Laminin	●			Garg *et al* , 2014; Katayama *et al* , 2005
21	*MTMR11*	intracellular	Phosphatase			●	
22	*LRRC32*	cell membrane	unknown			●	
23	*HIST2H2AA3 /// HIS*	intracellular	Nucleosome			●	
24	*LIF*	cell membrane	Growth factor	●			Peng *et al* , 2014
25	*CST2*	extracellular	Protease inhibitor			●	
26	*CPB1*	intracellular	Protease			●	
27	*DCLRE1A*	Intracellular	DNA repair gene			●	
28	*ADAP1*	intracellular	unkown			●	
29	*PLA2G16*	intracellular	Phospholipase		●		Nazarenko *et al* , 2006; Liang *et al* , 2015
30	*MAP4K4*	Intracellular	Kinase	●			Liang *et al* , 2008
31	*HOPX **	nucleus	unknown				Waraya *et al* , 2012
32	*ARL14*	intracellular	Ribosylation Factor			●	
33	*TP73-AS1*	intracellular	Transcription factor			●	
34	*CYP3A5*	intacellular	Cytochrome p450			●	
35	*TRIM29*	intracellular	Transcription factor	●			Sun *et al* , 2014
36	*DNAJB9*	intracellular	J protein			●	
37	*CAPRIN2*	intracellular	unknown			●	
38	*TRAK1*	intracellular	Transporter		●		An *et al* , 2011
39	*MRC1*	cell membrane	Receptor			●	
40	*LOC100653217 /// M*	cell membrane	Cell adhesion molecule			●	
41	*MUC1*	cell membrane	Glycoprotein	●			Wang *et al* , 2014

Supplemental Table 3. Therapeutical targets for pancreatic cancer treatment					
Antineoplastic drug	**Therapy type**	**Study population**	**Phase**	**Conclusion / status study**	**Reference / clinicaltrial.gov identifier**
Subcategory 1. Targets in pancreatic cancer clinical trials					
MUC1, rank 41					
MUC1 100mer peptide with SB-AS2 adjuvant	cancer vaccine	unresectable PDA	I	feasible	Ramanathan *et al* , 2005; NCT00008099
MUC1 100mer peptide	cancer vaccine	unresectable PDA	I	1/6 SD	Yamamoto *et al* , 2005
MUC1-DC and MUC1-CTL	adoptive immunotherapy	unresectable PDA	I	1/20 CR 5/20 SD	Kondo *et al* , 2008
MUC1-DC	adoptive immunotherapy	Advanced PDA	I	7/7 PD	Rong *et al* , 2012
90Y-hPAM4	radio-immunotherapy	Advanced PDA	I/II	6/38 PR 16/38 SD	Ocean *et al* , 2012; NCT00603863
Falimarev (fowlpox-CEA-MUC-1-TRICOM vaccine) Inalimarev (vaccinia-CEA-MUC1-TRICOM vaccine)	cancer vaccine	unresectable PDA	I	recruiting	NCT00669734
anti-MUC1 CAR T Cells	immunotherapy	advanced, refractory solid tumors	I/II	recruiting	NCT02587689
anti-MUC1 CAR-pNK cells	immunotherapy	Relapsed or Refractory Solid Tumor	I/II	rectruiting	NCT02839954
NQO1, rank 53					
Apaziquone	bioreductive prodrug activated by NQO1	Pancreatic cancer first line	II	Antitumour activity was not observed.	Dirix *et al* , 1996
PSEN2, rank 54					
MK-0752	NOTCH inhibitor	unresectable PDA	I	completed no results yet	NCT01098344
TNFSF11, rank 57					
Lenalidomide	immunotherapy	metastatic PDA	II	PR: 8/72 SD: 26/72 PD: 22/72 MOS 4.7 months	Infante *et al* , 2013
ITGB5, rank 65					
Cilengitide	anti-angiogenic therapy	unresectable PDA	II	C+G MOS: 6.7 months gemcitabine MOS: 7.7 months	Friess *et al* , 2006
MSLN, rank 110					
BAY94-9343	antibody drug conjugate	advanced, refractory solid tumors	I	recruiting	NCT02485119
BMS-986148	antibody drug conjugate	mesothelin positive pancreatic cancer	I	recruiting	NCT02341625
CART-meso	immunotoxin	metastatic mesothelin expressing cancers	I/II	recruiting	NCT01583686

CART-meso	immunotoxin	Mesothelin expressing cancers	I	recruiting	NCT02159716
CART-meso	immunotoxin	metastatic PDA	I	recruiting	NCT02465983
CART-meso	immunotoxin	metastatic PDA	I	safe and feasible	Beatty *et al* , 2014
CART-meso	immunotoxin	Metastatic	I/II	recruiting	NCT02959151
CART-meso	immunotoxin	PDA			
CART-meso	immunotoxin	PDA	I	recruiting	NCT02706782
SS1P(dsFv)-PE38	immunotoxin	unresectable or metastatic PDA	I/II	recruiting	NCT01362790
SS1P(dsFv)-PE39	immunotoxin	Mesothelin expressing cancers	I	SS1p is well tolerated	Hassan *et al* , 2007
SS1P(dsFv)-PE40	immunotoxin	mesothelin experessing cancers	I	SS1p is well tolerated	Kreitman *et al* , 2009
Morab-009 (amatuximab)	antibody	mesothelin expressing cancers	I	safe and feasible	Hassan *et al* , 2010
Morab-009 (amatuximab)	antibody	unresectable PDA	II	completed, no article published yet	NCT00570713
GVAX (GM-CSF)	immunotherapy	Advanced PDA	I	safe and feasible	Laheru *et al* , 2008
GVAX (GM-CSF)	immunotherapy	PDA, adjuvant;	II	PD: 17/60 MOS: 24.8 months	Lutz *et al* , 2011
ANZ-100 and CRS-207	cancer vaccine	metastatic PDA	I	Safe and feasible OS: 3/7 > 15months	Le *et al* , 2012
GVAX and CRS-207	cancer vaccine	metastatic PDA	II	cy/GVAX and CRS-207: OS 9.7 months cy/GVAX: OS 4.6 months	Le *et al* , 2015
LMB-100 + Nab-Paclitaxel	Immunotoxin combined with chemotherapy	Pancreatic Neoplasms	I/II	recruiting	NCT02810418
Anetumab ravtansine	Antibody drug conjugate	Pretreated Advanced Pancreatic Cancer	II	not yet recruiting	NCT03023722
SLC2A1, rank 154					
Glufosfamide vs F-5U	chemotherapy	metastatic PDA	III	recruiting	NCT01954992
Glufosfamide	chemotherapy	Advanced PDA	II	PR: 2/34 SD: 11/35 MOS: 5.3 months	Briasoulis *et al* , 2003
Glufosfamide + gemcitabine	chemotherapy	metastatic PDA	II	PR: 5/28 SD: 11/28 MOS: 6 months	Chiorean *et al* , 2010
Glufosfamide vs best supportive care	chemotherapy	metastatic PDA	III	MOS glufosfamide: 105 days MOS best supportive care: 84 days	Ciuleanu *et al* , 2009

PLK3, rank 148					
BI 2536	Polo-like kinase inhibitor	unresectable advanced PDA	II	PR: 2/79 SD: 19/79 MOS: 149 days	Mross *et al* , 2012
TPSAB1, rank 184					
nafamostat + gemcitabine	protease inhibitor + chemotherapy	advanced or metastatic PDA	I	PR: 3/12 SD: 7/12 PD: 2/7	Uwagawa *et al* , 2009
nafamostat + gemcitabine	protease inhibitor + chemotherapy	unresectable advanced or metastatic PDA	II	PR: 6/35 SD: 25/34 PD: 4/35 MOS: 10 months	Uwagawa *et al* , 2013
MMP11, rank 166					
marimastat vs gemcitabine	MMP inhibitor + chemotherapy	unresectable advanced or metastatic PDA	III	MOS gemcitabine: 167 days MOS 25mg: 125 days MOS 10mg: 105 days MOS 5 mg: 110 days	Bramhall *et al* , 2001
MMP28, rank 199					
marimastat	MMP inhibitor	Advanced PDA	II	SD: 41/83 in 28 day study period PD: 42/83 in 28 day study period MOS: 113 days	Bramhall *et al* , 2002
Subcategory 2. Targets in clinical trials in other cancer types					
MST1R, rank 95					
Foretinib	small-molecule multikinase inhibitor	advanced or metastatic gastric adenocarcinoma	II	PR: 0/69 SD: 15/65 lack of efficacy	Shah *et al* , 2013
Foretinib	small-molecule multikinase inhibitor	papillary renal cell carcinoma	II	ORR: 13.5% MPFS: 9.3 month	Choueiri *et al* , 2013
MGCD265	Tyrosine kinase inhibitor	Advanced metastatic or unresectable malignancy	I	recruiting	NCT00697632
MGCD266	Tyrosine kinase inhibitor	advanced or metastatic non-small cell lung cancer	II	recruiting	NCT02544633
PTMA, rank 106					
Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	metastatic esophageal cancer	II	not yet recruiting	NCT02545751
Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	metastatic small cell lung cancer	II	not yet recruiting	NCT02542137

Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	metastatic non small cell lung cancer	II	not yet recruiting	NCT02542930
Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	metastatic colon cancer	II	not yet recruiting	NCT02535988
Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	hepatocellular carcinoma	IV	not yet recruiting	NCT02281266
Thymalfasin / Thymosin 1 / (T-alfa-1)	Immunomodulatory polypeptide	metastatic melanoma patients	I	MOS: 9.4 months vs. 6.6 months	Maio *et al* , 2010
PRLR, rank 213					
prolanta	prolactine receptor antagonist	Epithelial ovarian cancer	I	recruiting	NCT02534922
LFA102	monoclonal antibody	breast and prostate cancer	I	completed, no results published	NCT01338831
Subcategory 3. Targets in preclinical *in vitro* and *in vivo* studies					
CTSE, rank 8					
Cathepsin E-activatable 5-ALA prodrug	photo dynamic therapy	in vivo - mouse PDA cells		Effectively targeting and killing cancer cells that express CTSE	Abd-Elgaliel *et al* , 2013
GGT5, rank 10					
GSAO (glutathione-S-conjugate activated by γGT cleavage)	prodrug	in vivo - PDA mouse model		Tumor γGT activity positively correlated with GSAO-mediated inhibition of pancreatic tumor angiogenesis and tumor growth in mice.	Ramsay *et al* , 2014
GJB3, rank 18					
Carbenoxolone	gap junction blocker	in vitro - Pancreatic stellate cells		Carbenoxolone inhibited platelet-derived growth factor-BB-induced proliferation and migration	Masamune *et al* , 2013
TNK2, rank 73					

AIM-100 pyrazolopyrimidine derivative 2b ALK inhibitor 5	TNK2 inhibitors	in vitro - prostate cancer cells		AIM-100 treatment is leading to cell cycle arrest in the G1 phase causing significant decrease in the proliferation of pancreatic cancer cells and induction of apoptosis.	Mahajan *et al* , 2012
(*R*)-9bMS	small-molecule inhibitor	triple negative breast cancer (TNBC)		In vitro inhibition significantly compromised TNBC proliferation	Wu et al, 2017
NPY1R, rank 92					
BIBP3226	peptide-drug conjugate	in vitro - neuroblastoma cells		The active compund BIBP3226 is able to release the drug intracellular	Langer *et al* , 2001
TRIO, rank 107					
TRIP-E32G	peptide aptamer	In vivo - NIH 3T3 cells		TRIPE32G reduces the formation of TRIO-induced tumors.	Bouquier *et al* , 2009
GPER, rank 118					
Gefitinib	Tyrosine Kinase inhibitor	In vitro – Triple-negative breast cancers cells		Reduction of GPER expression is a promising therapeutic approach for TNBC	Girgert *et al* , 2017

agonist G-1	GPER-receptor-agonist	In vitro – nonsmall cell lung cancer cells		G-1 treatment rapidly decreased the phosphorylation, nuclear translocation, and promoter activities of NF-κB, which will help to better understand the roles and mechanisms of GPER as a potential therapy target	Zhu *et al* , 2016
ADAM18, rank 141					
BK-1361	ADAM8 inhibitor	in vitro - PDA cells		BK-1361 decreased tumour burden and metastasis of implanted pancreatic tumour cells in mice	Schlomann *et al* , 2015
CDC42BPA, rank 142					
DJ4	small molecule inhibitor	in vitro - (PDA) cells		DJ4 treatment significantly blocked stress fiber formation and inhibited migration and invasion of multiple cancer cell lines	Kale *et al* , 2014
PRKCi, rank 161					
aPKC-PSP	pseudosubstrate peptide	In vivo -glioblastoma Stem-like cells (GSC)		Targeting PKCι in the context of Notch signaling could be an effective way of attacking the GSC population in GBM	Phillips *et al* , 2016
SULF1, rank 180					

IQ2-S	radioactive prodrug	in vitro - PDA cells		Quinazolinone-based radiopharmaceuticals can lead to the development of a novel noninvasive approach for imaging and treating pancreatic cancer.	Pospisil *et al* , 2012
S100P, rank 188					
cromolyn	cromolyn analog, C5OH	in vivo - PDA mouse		C5OH blocked the S100P-mediated growth and antiapoptotic effect in PDA and improved the animal survival.	Arumugam *et al* , 2013
2H8	S100P antibody	in vivo - mouse - PxPC3 cells		2H8 antibody decreased tumor growth and liver metastasis formation in a subcutaneous and orthotopic BxPC3 tumor model.	Dakhel *et al* , 2014
Subcategory 4. Suggested as potential targets					
	Cancer type	**Study type**		**Conclusion stu**	**Reference**
TMPRSS4, rank 9					
	breast cancer tissue	IHC		Prognostic marker	Liang *et al* , 2013
	Non-small cell lung cancer (NSCLC)	In vitro treatment with demethylating agent significantly increased TMPRSS4 levels		Potential therapeutic target	Villalba *et al* , 2016
	Gastric cancer	Upregulation of TMPRSS4 enhances the invasiveness of gastric cancer cells		Potential therapeutic target	Jin *et al* , 2016
FXYD3, rank 16					

	Breast cancer	Suppression of FXYD3 by transfection with siRNA		Overexpression of FXYD3 may be a marker of resistance to cancer treatments and a potentially important therapeutic target.	Liu *et al* , 2016a
CPB1, rank 26					
	Metastasis in Low Grade Breast Cancer samples	IHC		Biomarker	Bouchal *et al* , 2015
PLA2G16, rank 29					
	Osteosarcoma	In vitro and in vivo functional analyses		Potential therapeutic target	Li *et al* , 2016
MAP4K4, rank 30					
	Gastric cancer	In vitro siilencing of MAP4K4 by shRNA		Potential therapeutic strategy	Liu *et al* , 2016b
CBS, rank 42					
	in vitro - mouse	CBS silencing		CBS silencing resulted in reduced tumor cells proliferation, blood vessels formation and lipid content.	Chakraborty *et al* , 2015
	Colon cancer	In vivo - xenograft		Benserazide inhibits CBS activity and suppresses colon cancer cell proliferation and bioenergetics in vitro, and tumor growth in vivo	Druzhyna *et al* , 2016
GPRC5A, rank 70					
	colon cancer samples	IHC		Prognostic biomarker	Zougman *et al* , 2013
	oral squamus cell carcinoma	IHC		Prognostic biomarker	Liu *et al* , 2013
	gastric cancer samples	mRNA expression levels		Prognostic biomarker	Liu *et al* , 2015

	PDAC cells	siRNA		Suppression of GPRC5a results in decreased cell growth, proliferation and migration	Jahny *et al* , 2017
	breast cancer cell line	siRNA		Transfection of siRNA suppressed RAI3 mRNA and growth of the cancer cells.	Nagahata *et al* , 2005
KLK10, rank 79					
	Breast cancer	RNA-Sequencing analysis		Predictive biomarker for trastuzumab resistance and potential therapeutic target for reversing trastuzumab resistance	Wang *et al* , 2016
COPS5, rank 93					
	Breast cancer	Integrated genomic and functional studies		COPS5 overexpression causes tamoxifen-resistance in preclinical breast cancer models in vitro and in vivo > potential therapeutic approach for endocrine-resistant breast cancer	Lu *et al* , 2016
GTSE1, rank 97					
	Gastric cancer cells	shRNA GTSE1 knockout		Biomarker. Potential therapeutical target.	Deeb *et al* , 2014

	hepatocellular carcinoma cells	shRNA GTSE1 silencing		GTSE1 is aberrantly overexpressed in HCC cell lines and cancerous tissues > Potential therapeutic target	Guo *et al* , 2016
KMT2B, rank 104					
	Breast cancer cell	siRNA knockdown		Inhibition of IL-20 and KMT2B may have therapeutic benefits in ERα-positive breast cancer	Su *et al* , 2016
SPN, rank 160					
	HPB-ALL lymphob	UN1 monoclonal antibody		UN1 mAb is leading to natural killer–mediated cytotoxicity causing growth inhibition	Tuccillo *et al* , 2014
	mouse model - br	siRNA SPN knockdown		Reduction in primary tumour growth in vivo	Fu *et al* , 2014
RAMP1, rank 166					
	prostate cancer			Potential molecular target	Logan *et al* , 2013
HNF1A, rank 167					
	PDA tissue and cells	siRNA HNF1A knockdown		siRNA HNF1A knockdown reduced apoptosis in pancreatic cancer cell lines. HNF1A is a possible tumor suppressor	Luo *et al* , 2015
MYBL2, rank 181					

In vivo - mouse Breast cancer xenografts	Si-RNA		B-myb plays a role in cell cycle progression and tumorigenesis. Potential diagnostic / therapeutical target	Tao *et al* , 2014

(111)In-labeled PAM4	*phase I clinical trial* PET-scan	pancreatic cancer	radiolabeled PAM4 selectively targets pancreatic cancer in both the experimental animal model and clinical studies.	Gold *et al*, 2001
[64Cu]-DOTA-PR81	*in vivo - mouse* PET-scan	breast cancer xenografts	The biodistribution and scintigraphy studies showed the accumulation of 64Cu-DOTA-PR81 at the site of tumors with high sensitivity and specificity for MUC1 compared to control probes.	Alirezapour *et al*, 2016
Ab-FL-Cy5.5	*in vivo - mouse dual labelled optical imaging*	ovarian cancer xenografts	Ab-FL-Cy5.5 probe can be used for *in vivo* imaging of MUC1 expressing tumors	Zhang *et al*, 2015
NPY1R, rank 92				
[Lys(M/DOTA)4] BVD15	*in vitro*	Breast cancer cells	[Lys(DOTA)4]BVD15 is a potent and specific ligand for NPY1R	Zhang *et al*, 2016
MSLN, rank 110				
89Zr-MMOT0530A+E36:I4089Zr-MMOT0530A	*phase I clinical trial* PET-scan	pancreatic cancer and ovarian cancer	89Zr-MMOT0530A-PET pancreatic and ovarian cancer lesions as well as antibody biodistribution could be visualized.	Lamberts *et al*, 2015b
64Cu-NOTA-amatuximab	in vivo - *mouse PET-scan*	epithelial carcinoma cells	64Cu-NOTA-amatuximab enables quantification of tumor and major organ uptake values using PET scanning	Lee *et al*, 2015
Indium-CHX-A amatuximab	*phase I clinical trial* SPECT-scan	mesothelin overexpressing tumors	111In-amatuximab localizes to mesothelin expressing cancers with a higher uptake in mesothelioma than pancreatic cancer.	NCT01521325
Me-F127COOH-QD nanomicelles	*in vivo - mouse*	pancreatic cancer xenofgrafts	anti-mesothein antibody conjugated carboxylated F127 nanomicelles accumulated specifically at the pancreatic tumor site 15 min after intravenous injection with low toxicity	Ding *et al*, 2011
anti-mesothelin antibody-conjugated PEGlyated liposomal ultrasmall superparamagnetic iron oxides	*in vivo - mouse MRI*	pancreatic cancer xenofgrafts	M-PLDUs specically targets MSLN and could well improve the therapeutic efficacy of DOX chemotherapy in vivo and could be visualized by MRI in vivo.	Deng *et al*, 2012
GPER, rank 118				
99mTc(I)-labeled nonsteroidal GPER-specific ligands	in vivo - *mouse* SPECT-scan	human endometrial and breast cancer cell xenografts	99mTc-labeled-GPER-specific radioligands are tumor specific and could be cleary visualized using SPECT-scan	Nayak *et al*, 2014

42	*CBS*	intracellular	Lysase			●	
43	*UGT1A1 /// UGT1A*	intracellular	Transferase			●	
44	*GRB7*	cell membrane	Adaptor protein	●			Tanaka *et al* , 2006
45	*TREM2*	cell membrane	Receptor		●		Yang *et al* , 2014
46	*IGFBP5*	extracellular	growth factor binding protein	●			Johnson *et al* , 2006; Sarah K Johnson, 2009
47	*H2BFS*	intracellular	unknown			●	
48	*GSTM3*	intracellular	Transferase		●		Meding *et al* , 2012
49	*RTP4*	intracellular	Transporter			●	
50	*RUNX1T1*	intracellular	Transcription factor			●	

Abbreviation: GPRC, G-protein coupled receptor. SDR, Short Chain Dehydrogenase/Reductase

* Reduced protein expression level in cancer

Supplemental Table 4 – Targets for pancreatic cancer imaging				
Tracer name	**Study type**	**Cancer type**	**Conclusion**	**Reference**
THY1, rank 1				
Thy1-Targeted Microbubbles (MBThy1)	in vivo - *mouse* *ultrasound molecular imaging*	pancreatic cancer xenofgrafts	Thy1 targeted ultrasound molecular imaging is feasible	Foygel *et al* , 2013
CTSE, rank 8				
CTSE-activatable optical molecular probe	in vivo - *mouse* *optical imaging*	pancreatic cancer xenofgrafts	CTSE-activatable probe can be detected by confocal laser endomicroscopy (CLE)	Li *et al* , 2014
ritonavir tetramethyl-BODIPY (RIT-TMB)	in vivo - *mouse* *optical imaging*	pancreatic cancer orthotopic tumors	RIT-TMB imaging is feasible *in vitro* and demonstrated good co- localization with CTSE in both humand and mouse PDA samples	Keliher *et al* , 2013
CTSE-activatable optical molecular probe	in vivo - *mouse* *optical imaging*	pancreatic cancer xenofgrafts	The Cath E-activatable probe was able to highlight the Cath E-positive tumors; control imaging probe confirmed the superior selectivity and sensitivity	Abd-Elgaliel *et al* , 2011
GGT5, rank 10				
gGlu-HMRG	*ex vivo* *optical imaging* *EUS-FNA*	Human pancreatic samples	gGlu-HMRG did not clearly differentiate pancreatic tumor tissues from normal pancreatic ones because GGT activity was not different between tumor cells and normal cells.	
gGlu-HMRG	ex vivo breast cancer samples	Breast cancer	fluorescence derived from cleavage of gGlu-HMRG allowed easy discrimination of breast tumors from normal mammary gland tissues, with 92% sensitivity and 94% specificity.	Ueo *et al* , 2015
BODIPY-GSH	*In vitro*	Ovarian cancer cells	FIST probes enable monitoring the GGT activity in living cells,which showed differentiation between ovarian cancer cells and normal cells.	Wang *et al* , 2015
gGlu-HMRG	*Ex vivo*	colon carcinoma samples	Topically spraying gGlu-HMRG enabled rapid and selective fluorescent imaging of colorectal tumors owing to the upregulated GGT activity in cancer cells.	Sato *et al* , 2015
gGlu-HMRG	*In vivo - mouse*	Colon cancer mouse model	Fluorescence endoscopic detection of colon cancer was feasible. All fluorescent lesions contained cancer or high-grade dysplasia, all non-fluorescent lesions contained low-grade dysplasia or benign tissue.	Mitsunaga *et al* , 2013
gGlu-HMRG	*In vivo - mouse*	disseminated peritoneal ovarian cancer model	Activation of gGlu-HMRG occurred within 1 min of topically spraying the tumor, creating high signal contrast between the tumor and the background.	Urano *et al* , 2011
MUC1, rank 41				
aptamer-PEG-near- infrared fluorescence probe (APT-PEG-MPA)	*in vivo - mouse* *optical imaging*	breast cancer, non-small cell lung carcinoma, hepatocellular carcinoma xenografts	MUC1 aptamer-based NIR fluorescence probe has a high tumor-targetinga ability and low accumulation in normal tissue	Chen *et al* , 2015
MN-EPPT (iron oxide nanoparticles (MN), labeled with Cy5.5 dye conjugated to peptides (EPPT)	in vivo - *mouse* *optical imaging/MRI*	breast cancer transgenic mouse model	changes in uMUC-1 expression during tumor development and therapeutic intervention could be monitored non-invasively using molecular imaging approach with the uMUC-1-specific contrast agent (MN-EPPT) detectable by magnetic resonance and fluorescence optical imaging	Ghosh *et al* , 2013