

**Supplemental Table S7: Primary Outgrowth Rates for PDX Models**

A. Breast PDX (primary tumours only)

Study	Sample type	Mouse strain	Engraftment site	Donor pathology	Donor treatment	N sample	Outgrowth rate (%)	N	Definition of outcome
Shirakawa 2001	TF	Balb/c nude, SCID	subcutaneous	High grade inv DC (100%)	NR	10	10	patient	exponential growth
Zhang 2013	TF	SCID/Bg	orthotopic	IDC (89%)	Previous treatment	169	41	patient	A surviving tissue fragment > 1 mm in diameter and shown to be proliferative (Ki67+)
Valdez 2011*	IC	NSG	orthotopic	DC (100%)	NR	8	75	patient	8 weeks growth
Valdez 2011*	IC	NSG	orthotopic	DC (100%)	NR	34	42	tissue	8 weeks growth
Bergamaschi 2009*	TF	SCID	subcutaneous	IDC (76%); ILC (14%); MUC (10%)	NR	30	20	PDX	P0-P1. A diameter of approximately 15 mm.
Charafe-Jauffret 2013	IC	NSG	orthotopic	IDC (83.2%); ILC (7%); mixed (1.4%); MED (1.4%); other (7%)	CT (76%); IR (80%); HT (55%)	74	27	tissue	12 mm in the largest diameter (<1000 mm <sup>3</sup> ),
Visonneau 1998	TF	SCID, NOD/SCID	subcutaneous	Infiltrating carcinoma (13%); IDC (74%); mixed (13%)	NR	16	50	patient	Signs of heavy tumor burden (> 10% body weight), ulceration of the skin with bleeding, and/or signs of severe respiratory distress, weakness and lethargy.
Patsialou 2012	TF	SCID	orthotopic	ILC (13%), IDC (87%)	NR	29	27.6	tissue	samples that grew from 1st implantation
McAuliffe 2015	TF	Balb/c nude	subcutaneous	NR	Neoadjuvant therapy (50%)	48	27	tissue	tumor growth at the site of implantation
Cottu 2012	TF	Swiss nude	orthotopic	NR	NR	164	15	patient	NR
du Manoir 2014*	TF	Swiss nude	subcutaneous	NR	NR	130	30	patient	A maximum of 2000 mm <sup>3</sup>
Eyre 2016*	TF	NSG	subcutaneous	NR	RT (2%), CT (4%), HT (13%)	120	38	tissue	1.3cm <sup>3</sup>

\*possible oestrogen supplementation. TF = tissue fragments; IC = isolated cells. IDC = invasive ductal carcinoma; ILC = invasive lobular carcinoma; DC = ductal carcinoma; mets = metastases; AC = adenocarcinoma; inv= invasive; MUC = mucinous; MED = medullary. CT = chemotherapy; IR = irradiation; HT = hormone therapy. Bold = studies with unclear concerns for model validity; grey shade = studies with high risk of concern for model validity.

B. Colon PDX (primary tumours only, all subcutaneous using tissue fragments unless otherwise indicated)

Study	Mouse strain	Donor pathology	Donor Treatment	N sample	Outgrowth rate (%)	N	Definition of outcome
Davies 1981	nude mice	AC (100%)	NR	9	44	PDX	NR
Lee 2014	Balb/c nude or NOD/SCID	AC (100%)	TN	10	100	patient	1000 mm3
Mukohyama 2016	NOD/SCID	AC (100%)	NR	5	60	patient	1-2 cm
Mukohyama 2016**	NSG	AC (100%)	NR	8	50	patient	1-2 cm
Zhou 2011	Balb/c nude	AC (100%)	NR	21	14	patient	reached 1 cm diameter
Jin 2011	Balb/c nude	mAC (100%)	NR	20	60	PDX	>1500 mm3
Chou 2013*	NSG	AC (65%), mAC (23%), AC/NE (5%), NE (5%)	CT (18%)	28	61	patient	2 cm
Guan 2016	Balb/c nude	AC (89%), mAC (11%)		85	58.5	patient	150mm3
Linnebacher 2010	NOD/SCID	AC (98%); LNEC (2%)	TN	48	27	patient	reached 1-1.5cm3
Puig 2013*	NOD/SCID	AC (75%); mAC (25%)	CT (50%)	32	84	patient	reached 1cm3
Zhang 2015	NOD/SCID	AC (97%), mAC (3%)	CT (3%)	43	70	patient	500-1000 mm3
Dangles-Marie 2007	Swiss nude	NR	NR	11	82	patient	NR
Gock 2016	NMRI nude	NR	CT naïve	20	40	Tissue	1-1.5cm3
Julien 2012	Swiss nude	NR	CT (23%)	58	60	patient	800 -1500 mm3

\*Isolated cells, subrenal and subcutaneous. \*\* minced tissue. AC = adenocarcinoma; mAC=mucinous adenocarcinoma; CaG=carcinoma gingiva; Ca= carcinoid; LNEC = large cell neuroendocrine carcinoma; NE = neuroendocrine ; squamous cell carcinoma =SCC, combined small cell carcinoma =SCC; denosquamous =DS, pleomorphic carcinoma =PC . CT = chemotherapy; TN = treatment naïve. Bold = studies with unclear concerns for model validity; grey shade = studies with high risk of concern for model validity.

C. Lung PDX (primary tumours only, all tissue fragments)

Study	Mouse strain	Engraftment site	Donor pathology	Donor treatment	N sample	Outgrowth rate (%)	N	Definition of outcome
Anderson	NOD/SCID	orthotopic	100% SCC	NR	10	60	patient	confirmed SCLC tumours (800-1500mm3)
Russo 2015	CD1 nude	subrenal	100% SQCC	TN	12	92	PDX	first generation xenografts which closely resembled the parental tumour by H &E
Russo 2015	CD1 nude	subrenal	100% AC	TN	14	29	PDX	first generation xenografts which closely resembled the parental tumour by H &E
Dong 2010	NOD/SCID	subrenal	100% NSCLC	TN	527	90	PDX	49 days growth

Roife 2017	NOD/SCID	subcutaneous	100% NSCLC	Treatment (25%)	16	50	patient	1.5cm <sup>3</sup> tumour
Cutz, 2006	NOD/SCID	subrenal	7% squamous metaplasia; 7% carcinoid; 35% SQCC; 14% AC; 21% SCC; 7% carcinosarcoma	21% CT, 14% RT	14	78	patient	First-generation implant growth was assessed by palpation and harvested at 30 days or up to 60 days postgrafting
Hao 2015	NOD/SCID	subcutaneous	48% AC, 39% SQCC, 13% NE	NR	88	26	patient	Tumours which reached 1.5cm <sup>3</sup>
Zhang 2013	SCID, nude	subcutaneous	52% AC; 3% AC/SCC; 45% SCC	TN	31	45	patient	first generation of mice
Zhuang 2017	NCG	subcutaneous	44% AC; 33% SCC; 22% SQCC	NR	9	33	patient	500m <sup>3</sup> tumour
Bertolini 2009	CD1 nude	subcutaneous	80% AC; 20% LCC		29	34	tissue	NR

SCC = Small cell carcinoma; NSCLC = non-small cell lung cancer; AC = Adenocarcinoma; LCC = Large cell carcinoma; ASQC = Adenosquamous carcinoma; DC = ductal carcinoma; SQCC = squamous cell carcinoma; NE = neuroendocrine. CT = chemotherapy; RT = radiotherapy. TN = treatment naïve. Bold = studies with unclear concerns for model validity; grey shade = studies with high risk of concern for model validity.

D. Prostate PDX (primary tumours only, all tissue fragments)

Study	Mouse strain	Engraftment site	Donor pathology	Donor treatment	N sample	Outgrowth rate (%)	N	Definition of outcome
Priolo 2010	nude, NOD/SCID	subrenal	100% AC	TN	23	56	patient	grafts evaluated 3 months after grafting
Priolo 2010	nude, NOD/SCID	orthotopic	100% AC	TN	15	0	patient	grafts evaluated 3 months after grafting
Wang 2005	NOD/SCID	subrenal	100% AC		1	100	patient	60 or 90 days of growth
Russell 2015	nude	subcutaneous	66% AC, 33% AC/SCC	66% HT; 33% TN	29	17	patient	5–10 mm in diameter
Lawrence 2015	NOD/SCID, NSG	subrenal	20% HR, 80% CRPC	ADT (100%) and either RT, CT, abiratarone or enzalutamide	112	21	PDX	6-16 weeks growth
Lawrence 2015	NOD/SCID, NSG	subrenal	20% HR, 80% CRPC	100% had ADT and combinations of either RT, CT, abiratarone or enzalutamide	10	70	patient	6-16 weeks growth
Risbridger 2015	NSG	subrenal	100% G7	HN	62	8	PDX	Grafts with intraductal CAP evaluated between 6-14 wks after grafting.
Risbridger 2015	NSG	subrenal	100% G7	HN	12	17	patient	Grafts with intraductal CAP evaluated between 6-14 wks after grafting

Risbridger 2015	NSG	subrenal	100% G7	HN	62	71	PDX	Grafts with AC evaluated between 6-14 wks after grafting.
Risbridger 2015	NSG	subrenal	100% G7	HN	12	100	patient	Grafts with AC evaluated between 6-14 wks after grafting
Risbridger 2015*	NOD/SCID, NSG	subrenal	100% G7	HN	191	43	PDX	grafts containing tumor foci
Risbridger 2015*	NOD/SCID, NSG	subrenal	100% Gleason 7	HN	12	100	patient	grafts containing tumor foci
Toivanen 2011	NOD/SCID	subrenal	100% G7	NR	41	41	PDX	grafts containing tumor foci
Toivanen 2011	NOD/SCID	subrenal	100% G7	NR	6	67	patient	grafts containing tumor foci
Wetterauer 2015	NSG, NOG	subcutaneous, subrenal	70% G7, 20% G9, 10% G8	NR	27	37	patient	Assessed 3 months after grafting. Rate includes lymphoma development
Pretlow 1993	nude	subcutaneous	50% G9, 25% G7, 25% G8	NR	49	33	PDX	Tumors reaching a diameter of 4mm
Pretlow 1993	nude	subcutaneous	50% G9, 25% G7, 25% G8	NR	20	30	patient	Tumors reaching a diameter of 4mm
Presnell 2001	nude	subcutaneous	60% G6, 40% G8	NR	5	100	PDX	Assessed 1 month after grafting
Klein 1997	SCID	subcutaneous	66% T3, 33% T4	66% ADT	3	66	patient	2 to 3-fold increase in size
Chen 2013	NOD/SCID	subrenal	NR	TN	112	30	PDX	palpable tumour
Chen 2013	Rag2	subrenal	NR	TN	2	100	PDX	palpable tumour
Chen 2013	NOD/SCID	subcutaneous	NR	TN	228	69	PDX	palpable tumour
Chen 2013	Rag2	subcutaneous	NR	TN	32	63	PDX	palpable tumour
Chen 2013	NSG	subcutaneous	NR	TN	89	75	PDX	palpable tumour
Chen 2013	NOD/SCID	orthotopic	NR	TN	55	18	PDX	palpable tumour
Yoshikawa 2016	SCID	subcutaneous, subrenal	NR	100% ADT, CT, RT	5	25	PDX	NR
van Weerden 1996	NMRI nude	subcutaneous	NR	80% TN, 20% ADT	13	38.5	patient	primary take rate
van Weerden 1996	BALB/c nude	subcutaneous	NR	80% TN, 20% ADT	25	0	patient	primary take rate

\*isolated cells. AC = adenocarcinoma; SCC = small cell carcinoma. G = Gleason grade; HR = hormone responsive; CRPC = castrate resistant prostate cancer; HN = hormone naïve; ADT = androgen deprivation therapy. TN = Treatment naïve. Bold = studies with unclear concerns for model validity; grey shade = studies with high risk of concern for model validity.