

Baseline Results from the UK SIGNIFY Study: A Whole-Body MRI Screening Study in *TP53* Mutation Carriers and Matched Controls

Sibel Saya MSc*, Emma Killick MD^{2*}, Sarah Thomas MSc, Natalie Taylor, Elizabeth K. Bancroft PhD,
Jeanette Rothwell MSc, Sarah Benafif MBBS, Alexander Dias MBBS, Christos Mikropoulos MD, Jenny Pope,
Anthony Chamberlain MSc, Ranga Gunapala MSc, The SIGNIFY Study Steering Committee, Louise Izatt
PhD, Lucy Side MD, Lisa Walker MS, Susan Tomkins MB ChB, Jackie Cook MD, Julian Barwell PhD, Vicki
Wiles MSc, Lauren Limb MSc, Diana Eccles MD, Martin O. Leach PhD, Susan Shanley PhD, Fiona J. Gilbert
FRCP, FRCR, Helen Hanson MD, David Gallagher MD, Bala Rajashanker MRCP, FRCR, Richard W.
Whitehouse MD FRCR**, Dow-Mu Koh MD FRCR**, S. Aslam Sohaib MRCP FRCR**, D. Gareth Evans
MD FRCP**, Rosalind A. Eeles PhD FRCP**

*Joint first authorship

**Joint last authorship

Corresponding author:

Prof Rosalind Eeles MA, FRCR, FRCP, PhD, FMedSci
The Institute of Cancer Research and Royal Marsden NHS Foundation Trust,
15 Cotswold Road,
Sutton SM2 5NG,
United Kingdom
Tel. +44 208 722 4094
Fax +44 208 722 4110
rosalind.eeles@icr.ac.uk

Supplementary Table 1: MR Imaging Protocol

	T1-weighted gradient echo	Fat-suppressed T2-weighted HASTE	DWIBS Whole body diffusion weighted MR imaging with background signal suppression	T1-weighted VIBE DIXON
Coverage	From vertex to feet	From vertex to feet	From vertex to feet	From vertex to feet
No of slice partitions	30	30	30 image sections per stack	52
Technique	Breath-hold	Breath-hold	Free-breathing	Breath-hold
Orientation	Axial	Axial	Axial	Coronal
Field of View (cm)	38-40	38-40	38-40	38-40
Matrix Size	182 * 320	208 * 256	128 * 128	192 * 192
TR	247	1000	8600	6.97
TE	4.36	84	72	2.39
Flip Angle	70	180	n/a	n/a
Voxel Size (mm)	1.2 * 1.2 * 8	1.5 * 1.5 * 8	1.5 * 1.5 * 8	1 * 1 * 5
Echo-planar imaging factor			150	
Parallel imaging factor	2	2	2	3
No. of signals averaged	1	1	4	1

Section thickness (mm)	8	8	8	5
Direction of motion probing gradients	None	None	3 scan trace	None
Receiver Bandwidth	300	501	1954	450
Fat Suppression **	None	SPAIR	STIR (T1 = 180ms)	None
b-values (s/mm²)	Not applicable	Not applicable	Typically 50 and 800-1000	Not applicable

Supplementary Table 2: Details of Incidental Findings and Follow up Investigations

Gender	Age	Control/Carrier	MRI abnormality	Investigations	Outcome
M	29	Carrier	Maxillary sinusitis Left leg: multiple high signals in bone Right humerus: high T2 signal Right leg: ?deposits	Repeat WB MRI	Pending
M	29	Carrier	Left lower lobe lung lesion probably infective	Chest X-ray	Chest infection
M	49	Carrier	Thyroid nodule	Thyroid Ultrasound	Benign
F	51	Carrier	Abdominal wall lesion, suspicious of sarcoma Liver nodule	US guided biopsy Liver US	Myxosarcoma Benign
F	48	Carrier	Ovarian Cysts Pericardial Cyst	CA-125 & TVUS None until symptomatic	Normal Sarcoma
F	48	Carrier	5mm lung nodule	Contrast enhanced CT chest	Lesion resolved
M	41	Carrier	Left ureteric abnormality and atrophic L kidney	Renal function (serum creatinine and estimated GFR)	Normal
M	40	Carrier	Posterior left ilium lesion	Dedicated pelvic MRI x 5 CT plus CT guided biopsy	No evidence of osteosarcoma on biopsy
F	21	Carrier	1.8cm well circumscribed lesion segment 7 of liver Indeterminate lesion on upper pole of right	Contrast MRI liver and kidney Partial nephrectomy and	Liver and kidney EAML

			kidney 3.4 cm	partial hepatectomy	
F	58	Carrier	12mm angiomyolipoma in right kidney Possible fatty lesion in liver	Liver MRI x 2 Renal MRI x 2 + US	Continuing surveillance
F	33	Carrier	Right temporal lobe cyst	MRI brain	Astrocytoma
F	34	Carrier	Right ovarian cyst	TVUS CA-125 x2	Cyst resolved
F	52	Carrier	Lung lower lobe pleurally based lung lesion Small lesion in right lobe of liver Cystic lesion right side of vagina	Chest CT PET-CT x2 Liver/pelvic MRI	Continuing surveillance for lung lesion Haemorrhagic cyst of liver Vaginal Gartner duct cyst
F	53	Carrier	4.5 x 2.8cm cyst behind right knee	Lower leg US x 2, MRI & CT	Benign
M	43	Carrier	Non-specific signal changes around sacroiliac joint	Pelvic MRI	Sacro-iliitis, referred to rheumatologist
F	45	Carrier	Large right renal mass Uterine fibroids Left ovary cyst	Abdominal CT Pelvic MRI Right nephrectomy, TAH and left salpingo-oophorectomy	Chromophobe renal cell carcinoma Benign renal angiomyolipoma Uterine leiomyosarcoma Uterine leiomyoma

					Benign left ovary cyst
F	25	Control	Right ovary cyst 3cm	TVUS	Cyst resolved
F	40	Control	Left ovary cyst 3cm	TVUS	Cyst resolved
M	43	Control	Oedema and fatty change in right gastrocnemius muscle	MRI left lower leg with contrast	Benign AVM or haemangioma
M	40	Control	Liver cyst	Liver US	Pending
M	41	Control	Liver cyst Right renal cyst	US abdomen	Haemangioma Simple renal cyst
C37 F	39	Control	Cyst in right SI joint Cystic changes in breasts	MRI of right SI joint in 6 months Breast US	Pending Breasts- simple cysts only
C40 M	51	Control	Liver cyst haemangioma Renal cyst	Liver and renal US	Haemangioma Cortical cysts

AVM = arterio-venous malformation; EAML = Epithelioid angiomyolipoma; GFR= glomerular filtration rate;

SI = sacro-iliac; TAH = total abdominal hysterectomy; TV = transvaginal; US = ultrasound