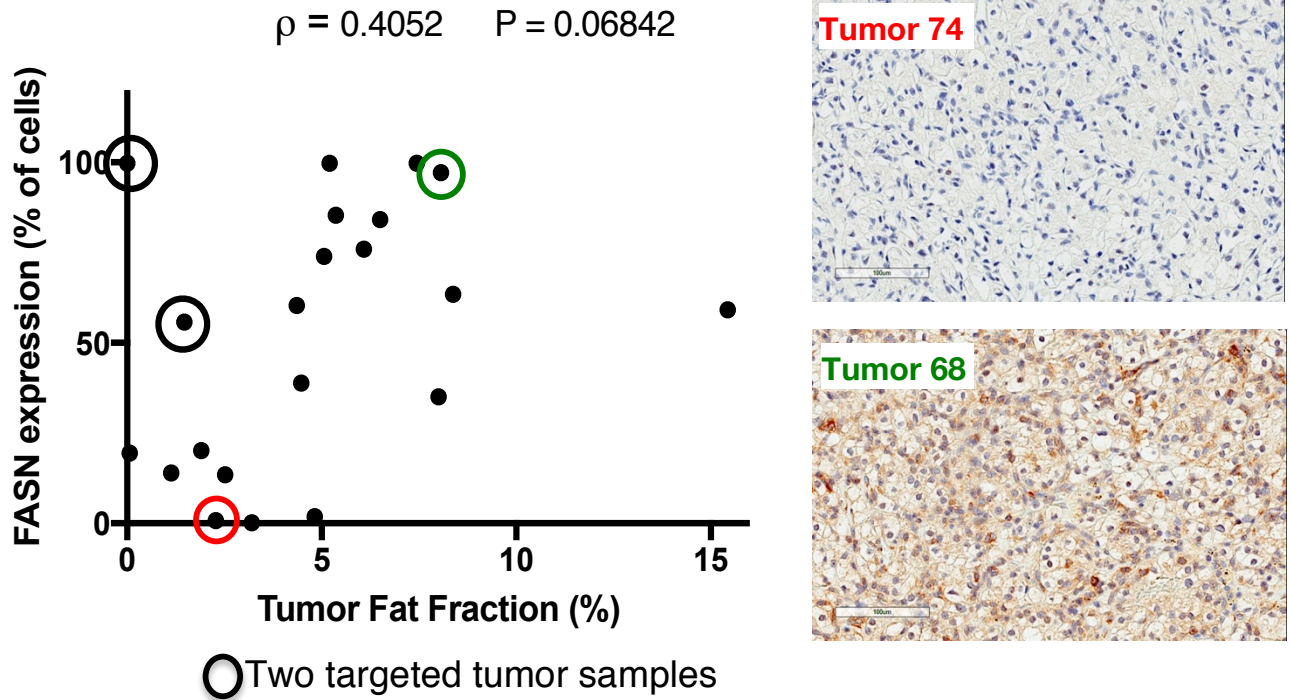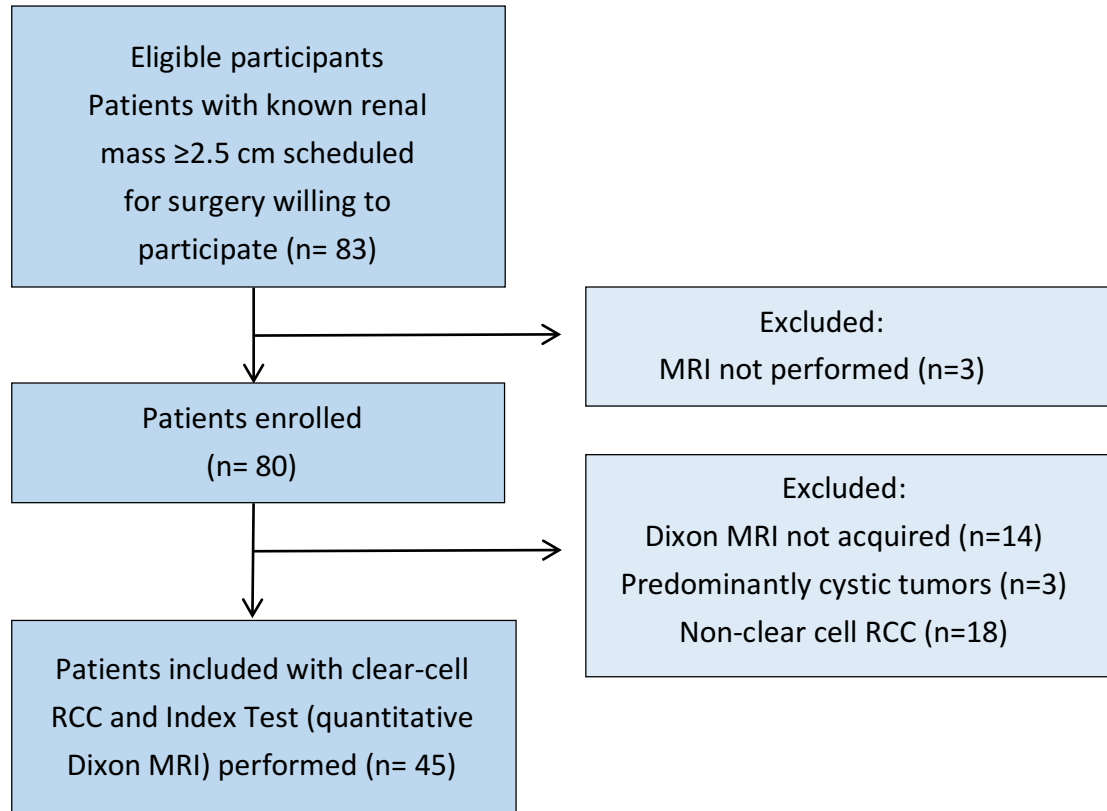**SUPPLEMENTARY MATERIALS**

Fig. S1: Fat fraction correlation with fatty acid synthase (FASN) staining indicates a

positive trend towards significance. Graph shows the correlation between fat fraction values

and FASN expression (measured as percentage of cells exhibiting positive staining on FASN

immunohistochemistry [IHC]) in 21 ccRCC targeted tumor samples. The Spearman correlation

values are indicated in the graph. The red circle indicates a tumor that has low FF values and

corresponding low levels of FASN expression (top right, IHC of tumor 74), and the green circle

indicates the tumor that has high FF values and corresponding high levels of FASN staining

(bottom right, IHC of tumor 68). The black circles indicate two outlier samples with low FF

values and high FASN levels from the same ccRCC tumor, as explained in results and

discussion. The scale bar indicates 100 μm.

Fig S2. Flow Chart of Study Participants

Eligible participants
Patients with known renal
mass ≥2.5 cm scheduled
for surgery willing to
participate (n= 83)

Excluded:
MRI not performed (n=3)

Patients enrolled
(n= 80)

Excluded:
Dixon MRI not acquired (n=14)
Predominantly cystic tumors (n=3)
Non-clear cell RCC (n=18)

Patients included with clear-cell
RCC and Index Test (quantitative
Dixon MRI) performed (n= 45)

Supp Table S1: Patient and tumor characteristics

Characteristic	No. of Patients	%	Tumor Size (cm)
Age (years)	58.2 ± 11.6		
Gender			
M	36	80	
F	9	20	
T Stage			
I	27	60	
II	0	0	
III	17	37.8	
IV	1	2.2	
ISUP Grade			
1	0	0	0
2	19	42	4 ± 2
3	22	49	6 ± 2.4
4	4	9	11 ± 4
Treatment			
RPN	26	58	
LRN	7	15	
OPN	3	7.0	
ORN	8	18	
LSN	1	2	
Histology			
Clear cell	45	100	5.5 ± 3
Necrosis	14	32.6	
Sarcomatoid	2	4.7	

Note: Data are means ± standard deviations. ISUP = International Society of Urological

Pathology

RPN = robotic partial nephrectomy   LRN = laparoscopic radical nephrectomy

LSN = laparoscopic simple nephrectomy OPN = open partial nephrectomy

ORN = open radical nephrectomy.

Supp Table S2: Characteristics of tumors used for Oil Red O staining

(22 patients, 27 tumor samples)

Characteristic	No. of Patients	%	Tumor Size (cm)
Average Age (years): 57.32 ± 10.4			
Gender			
M	17	77.3	
F	5	22.7	
ISUP Grade			
1	0	0	0
2	10*	45.5	3.69 ±1.45
3	10	45.5	6.1 ± 2.54
4	2	9.1	12.65 ± 5.16
Treatment			
RPN	15	68.2	
LRN	2	9.1	
OPN	0	0.0	
ORN	4	18.2	
LSN	1	4.5	
Histology			
Clear cell	22	100.0	5.6 ± 3.4
Necrosis	6	27.3	8.11 ± 5.62
Sarcomatoid	2	4.7	12.65 ± 5.16

Note: Data are means ± standard deviations. ISUP = International Society of Urological Pathology. * One tumor showed 5% grade 3 features

RPN = robotic partial nephrectomy   LRN = laparoscopic radical nephrectomy

LSN = laparoscopic simple nephrectomy OPN = open partial nephrectomy

ORN = open radical nephrectomy.

Supp Table S3. Tabulation of the lipid species identified by mass spectrometric analysis as described in materials and methods. The total number of lipid molecules in each lipid class is represented.

Lipid Type	Lipid Classes	No. of species
Neutral Lipids	Cholesterol ester (CE)	27
	Monoacylglycerol (MAG)	2
	Diacylglycerol (DAG)	153
	Triacylglycerol (TAG)	495
Phospholipids	Lysophosphatidylcholine (LysoPC)	18
	Lysophosphatidylethanolamine (LysoPE)	7
	Phosphatidylcholine (PC)	320
	Phosphatidylethanolamine (PE)	105
	Phosphatidylserine (PS)	171
	Phosphatidic acid (PA)	74
	Phosphatidylinositol (PI)	78
	Phosphatidylglycerol (PG)	207
Sphingolipids	Sphingomyelin (SM)	2
	Ceramide (Cer)	21
	Hexo Ceramide (HexCer)	51
Polar Lipids	Cardiolipin (CL)	3
	Free Fatty acids (FFA)	25
	Total	**1759**