Matrix Gla protein is an independent predictor of both intimal and medial vascular calcification in chronic kidney disease

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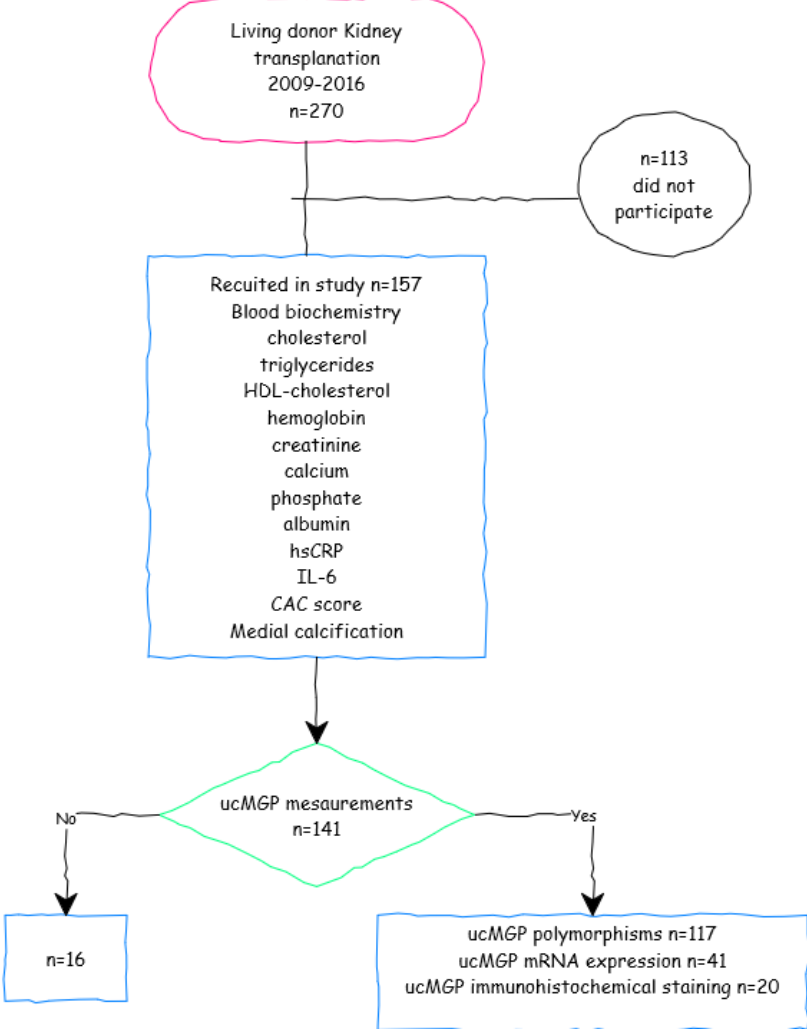Dept of Clinical Science Technology and Intervention

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Flow chart of study

Living donor Kidney
transplanation
2009-2016
n=270

n=113
did not
participate

Recuited in study n=157
Blood biochemistry
cholesterol
triglycerides
HDL-cholesterol
hemoglobin
creatinine
calcium
phosphate
albumin
hsCRP
IL-6
CAC score
Medial calcification

ucMGP mesaurements
n=141

No

Yes

n=16

ucMGP polymorphisms n=117
ucMGP mRNA expression n=41
ucMGP immunohistochemical staining n=20

Supplemental Figure S1 flow chart of patient inclusion

Supplemental Table S1 Other baseline clinical and biochemical characteristics in 141 CKD 5 patients in relation to tertiles of dp-ucMGP

	All (n=141)	1st tertile (n=46)	2nd tertile (n=47)	3rd tertile (n=48)	p-value
iPTH, (ng/L)	261 (83, 558)	255 (81, 747)	270 (84, 502)	290 (49, 563)	0.72
1,25-OH vitamin, (mmol/L) ††	18 (9, 32)	18 (11, 35)	18 (9, 33)	17 (7, 32)	0.89
25(OH) D-vitamin, (mmol/L) ¶¶	35 (17, 72)	33 (16, 75)	38 (12, 69)	36 (21, 73)	0.64
hsCRP, (mg/L) ••	0.7 (0.2, 4.0)	0.5 (0.2, 2.5)	0.7 (0.2, 3.9)	1.5 (0.3, 10.7)	<0.001
IL-6, (pg/mL) ***	1.3 (0.1, 4.1)	0.9 (0.01, 3.0)	1.6 (0.3, 3.4)	1.4 (0.02, 6.6)	0.06
TNF, (pg/mL) ‡‡‡	10.5 (7.6, 16.5)	8.9 (7.3, 12.3)	10.7 (7.3, 16.1)	12.6 (9.1, 20.4)	<0.001
CTX, (ng/ml) •	1.8 (0.5, 5.1)	1.8 (0.4, 4.9)	1.8 (0.6, 5.5)	1.9 (0.5, 4.4)	0.88
FGF-19, (pg/ml) *	117 (41, 331)	133 (39, 439)	86 (35, 263)	135 (53, 343)	0.02
FGF-23, ††† (pg/ml)	4055 (676, 48027)	3668 (350, 32935)	7581 (826, 44887)	6391 (624, 99267)	0.40
Klotho, (pg/ml) ••	389 (213, 669)	366 (188, 763)	382 (212, 671)	414 (257, 585)	0.66
ALP, (U/L)	65.9 (39.8, 118.3)	69.7 (41.7, 118.2)	65.1 (37.4, 122.9)	65.5 (39.4, 121.5)	0.95
BALP, (ug/L)	15,8 (8.6, 41.5)	16.1 (8.9, 40.7)	14.7 (8.6, 41.1)	17.2 (8.3, 43.4)	0.84
Sclerostin, (pg/ml) **	432 (245, 830)	409 (215, 802)	440 (244, 807)	431 (259, 897)	0.55
Medication					
Statins, (%)	37	30	36	44	0.41
β-blockers, (%)	58	44	62	69	0.04
Calcium blocker, (%)	51	54	55	44	0.46
Phosphate binders, (%)	53	54	53	52	0.98

Data presented as median (10th – 90th percentile) or percentage

Supplemental Table S2 Genotype distributions of *MGP* polymorphisms rs4236, rs1800801 and rs1800802 in 117 CKD5 patients and 389 controls.

		CKD5 patients	**Controls**	**P-value***
MGP rs4236, n (%)	**T/T**	51 (44)	152 (39)	0.03
	T/C	59 (50)	177 (46)	
	C/C	7 (6)	60 (15)	
MGP rs1800801, n (%)	**C/C**	62 (53)	171 (44)	0.03
	C/T	48 (41)	161 (41)	
	T/T	7 (6)	57 (15)	
MGP rs1800802, n (%)	**A/A**	69 (59)	232 (59)	0.89
	A/G	42 (36)	145 (37)	
	G/G	6 (5)	16 (4)	

*Pearson's Chi-Square test

Supplemental Table S3 Distribution of patient characteristics in relation to *MGP* genotypes in 117 CKD5 patients.

		MGP genotypes			P-value
		rs4236			
		T/T	**T/C**	**C/C**	
Age (years)		47 (24-64)	45 (23-62)	39 (28-66)	0.58
Males (%)		76	63	43	0.11
DM (%)		10	8	14	0.88
dp-ucMGP (pmol/L)		1333 (745-2218)	1193 (661-2526)	1329 (799-1998)	0.65
MGP mRNA (RQ)[≠]		1.2 (0.3-3.4)	0.9 (0.4-1.7)	0.61 (0.5-0.8)	0.15
CAC score (AU)[#]		37 (0-1729)	1 (0-1068)	0 (0-12)	0.09
Media VC score, (%)[¤]	0	11	18	29	0.30
	1	40	54	57	
	2	31	20	0	
	3	18	9	14	
		rs1800801			
		C/C	**C/T**	**T/T**	
Age (years)		47 (25-63)	45 (23-62)	41 (29-63)	0.65
Males (%)		74	63	43	0.15
DM (%)		10	8	14	0.88
dp-ucMGP (pmol/L)		1315 (755-2737)	1191 (650-2478)	1329 (799-1998)	0.57
MGP mRNA (RQ)[≠]		1.2 (0.4-3.1)	0.9 (0.4-1.8)	0.6 (0.5-0.8)	0.16
CAC score (AU)[#]		15 (0-1312)	0 (0-990)	0 (0-12)	0.06
Media VC score, (%)[¤]	0	15	15	29	0.05
	1	35	62	57	
	2	33	15	0	
	3	17	9	14	
		rs1800802			
		A/A	**A/G**	**G/G**	
Age (years)		45 (23-62)	47 (25-64)	49 (36-60)	0.59
Males (%)		70	64	70	0.85
DM (%)		9	12	0	0.62
dp-ucMGP (pmol/L)		1323 (766-2526)	1232 (654-2016)	1121 (848-1884)	0.78
MGP mRNA (RQ)[≠]		1.0 (0.5-2.1)	1.3 (0.3-2.0)	1.3 (0.9-1.6)	0.88
CAC score (AU)[#]		0 (0-1061)	12 (0-1021)	15 (14-1710)	0.27
Media VC score, (%)[¤]	0	17	16	0	0.35
	1	54	39	40	
	2	15	34	40	
	3	14	10	20	

Data presented as median (range of 10th–90th percentile) or percentage. Differences between genotype groups were evaluated with Kruskal-Wallis and Pearson's Chi-square tests.

≠n=41; #n=91; ¤n=108