

**Supporting Information**  
**for**  
**Assessment of DNA Epigenetic Modifications**

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Table S1. Reported contents of 5mC in DNA from various species and organs.

Modification	Species / organs	Contents	References	Year
5mC	<b>Eukaryotes (mammal, elegans, Drosophila)</b>			
	Human tissues (Placenta, sperm, heart, liver, lungs, spleen, lymphocytes, brain, thymus)	0.76-1.00% [5mC/DNA]	1	1982
	<i>Homo sapiens</i>	1.22% [5mC/DNA]	2	1984
	<i>Drosophila melanogaster</i>	0.008% [5mC/DNA]	2	1984
	<i>Drosophila melanogaster</i> embryos	0.1-0.4% [5mC/dC]	3	2000
	Human placenta	2.994% [5mC/(5mC+dC)]	4	2004
	Human brain	3.84% [5mC/(5mC+dC)]		
	Human liver	3.702% [5mC/(5mC+dC)]		
	<i>Clupea pallasii</i> , sperm	10.82% [5mC/(5mC+dC)]	5	2008
	HeLa cells	3.8% [5mC/(5mC+dC)]	6	1985
		3.0% [5mC/(5mC+dC)]	7	2009
		2.8% [5mC/dG]	8	2013
	293T cells	2.6% [5mC/dC]	9	2011
	Mouse organs (heart, liver, lung, spleen, brain cortex, thymus, pancreas, E14, E14 Tet1 knockdown)	2.4-3.1% [5mC/dC]		
	Human blood	3.75% [5mC/(5mC+dC)]	10	2011
	Earthworms	3.36% [5mC/(5mC+dC)]		
	Salmon testes	6.98% [5mC/(5mC+dC)]		
	Human normal-adjacent colorectal tissue	5.2% [5mC/(5mC+dC)]	11	2011
	Human tumor-adjacent colorectal tissue	3.6% [5mC/(5mC+dC)]		
	A549 cells	4.28% [5mC/dG]	12	2011
	HepG2 cells	3.81% [5mC/dG]		
	HK2 cells	5.39% [5mC/dG]		
	Human sperm	4.22% [5mC/dG]		
	HEK293T-Tet1	2.7% [5mC/dG]	8	2013
	HEK293T-Tet1m	3.6% [5mC/dG]		
	Human brain	5.3% [5mC/dG]		
	WM-266-4	2.8% [5mC/dG]		
	Mouse brain	4.6% [5mC/dG]		
	Mouse skin (red head)	3.4% [5mC/dG]		
	Mouse skin (albino)	3.4% [5mC/dG]		
	Human tumor-adjacent lung tissue	3.6% [5mC/(5mC+dC)]	13	2013
Rat liver		3.55% [5mC/(5mC+dC)]	7	2009
		3.5% [5mC/(5mC+dC)]	13	2013
	Calf thymus	6.26% [5mC/(5mC+dC)]	7	2009

		5.8% [5mC/(5mC+dC)]	13	2013
<i>Mus musculus</i>		7.6% [5mC/dC]	14	2014
<i>Drosophila melanogaster</i> adult		0.034% [5mC/dC]		
<i>Caenorhabditis elegans</i>		0.0019-0.0033% [5mC/dC]	15	2015
Human CRC tumor tissues		3.5% [5mC/dG]	16	2015
Human CRC tumor-adjacent normal tissues		4.1% [5mC/dG]		
Mouse ES cells		3.0% [5mC/dG]	17	2017
NHDF-Neo cells		0.85% [5mC/dN]	18	2017
K562 cells		0.28% [5mC/dN]		
Me45 cells		0.72% [5mC/dN]		
HCT 116, BL cells		0.86% [5mC/dN]		
Raji cells		0.80% [5mC/dN]		
Peripheral blood leukocytes		4.11% [5mC/dC]	19	2018
CAD patients		3.75% [5mC/dC]		
<b>Plants</b>				
<i>Pisum sativum</i>		23.2% [5mC/dC]	20	1981
<i>Sinapsis alba</i>		12.2% [5mC/dC]		
<i>Viscum album</i>		23.2% [5mC/dC]		
<i>Vicia faba</i>		30.5% [5mC/dC]		
<i>Nicotiana tabacum</i>		32.6% [5mC/dC]		
<i>Triticum aestivum</i>		22.4% [5mC/dC]		
<i>Triticum</i> (wheat germ)		20.1% [5mC/dC]	21	1984
<i>Lycopersicum esculentum</i>		23% [5mC/dC]	22	1991
<i>Nicotiana tabacum</i>		32.4% [5mC/(5mC+dC)]	23	1993
		33.5-35.0% [5mC/dC]	24	1993
<i>Brassica napus</i>		14.7% [5mC/dC]	25	1999
<i>Zea mays</i>		35% [5mC/DNA]	26	1988
		16.33-16.89% [5mC/dC]	27	2007
		13.4-15.0% [5mC/dC]	28	2008
<i>Arabidopsis thaliana</i> Col0, leaves		6.47% [5mC/(5mC+dC)]	5	2008
<i>Nicotiana tabacum</i>		34.15% [5mC/(5mC+dC)]		
<i>Medicago sativa</i>		19.16% [5mC/(5mC+dC)]		
<i>Lepidium sativum</i>		14.6% [5mC/(5mC+dC)]	10	2011
<i>Linum usitatissimum</i>		15-19% [5mC/dC]	29	2012
<i>Oryza sativa</i>		14% [5mC/dC]	30	1990
		11-14% [5mC/(5mC+dC)]	23	1993
		16.0% [5mC/dC]	31	2001
<i>Arabidopsis thaliana</i>		4.6% [5mC/dC]	21	1984
		6.5% [5mC/dC]	32	2006
		9.63% [5mC/dG]	33	2013
		14.0% [5mC/dC]	14	2014
<b>Fungus</b>				

	<i>Saccharomyces cerevisiae</i>	0.3-1.0% [5mC/dC]	34	1978
	<i>Apodachlya sp., Schizosaccharomyces pombe, Aspergillus nidulans nidulnns</i>	$\leq 0.10\%$ [5mC/(5mC+dC)]	35	1984
	<i>Phycomyces blakesleeanus</i>	0.50% [5mC/(5mC+dC)]		
	<i>Sporotrichum dimorphosphorum</i>	0.20% [5mC/(5mC+dC)]		
	<i>Candida albicans Sh8, 9938, B311</i>	0.045-0.11% [5mC/DNA]	36	1987
	Yeast	0.014-0.364% [5mC/(5mC+dC)]	37	2012
	<b>Unicellular prokaryotes</b>			
	<i>Chlamydomonas reinhardtii</i>	0.70% [5mC/dC]	34	1978
	<i>Tetrahymena pyriformis</i>	$<0.02\%$ [5mC/dC]		
	<i>Anabaena sp. strain PCC 7120</i>	4.28% [5mC/dC]	38	1988
	<i>Plectonema sp. strain 594</i>	2.9% [5mC/dC]		
	<i>Synechococcus cedrorum R2</i>	1.3% [5mC/dC]		
	<b>Bacteria</b>			
	<i>Salmonella typhosa</i>	0.91-1.02% [5mC/dC]	39	1968
	<i>Alcaligenes faecalis</i>	1.89% [5mC/dC]		
	<i>Bacillus brevis R, S and P</i>	0.26%, 1.94% and 0.61% [5mC/dC]		
	<i>Agrobacterium tumefaciens</i>	0.52% [5mC/dC]		
	<i>Propionibacterium shermanii</i>	1.53% [5mC/dC]		
	<i>Mycobacterium luteum</i>	0.30% [5mC/dC]		
	<i>Escherichia coli C, CK</i>	0.92-0.95% [5mC/dC]	39	1968
		1.00% [5mC/dG]	40	2012
	<i>Escherichia coli B</i>	$<0.01\%$ [5mC/dG]	40	2012
	<i>Escherichia coli (EC6001, 6002, 6006, 6026; ECOR11, 27, 47, 52; Popeye-1)</i>	0.86-1.30% [5mC/dG]		
	<i>Escherichia coli DH5α</i>	2.3% [5mC/dC]		
	<i>Escherichia coli GM2929 (dcm-6)</i>	0.016% [5mC/dC]	14	2014
	<b>Virus</b>			
	<i>Phage φX174</i>	0.02% [5mC/DNA]	2	1984
	Lambda phage	$< 0.30\%$ [5mC/(5mC+dC)]	5	2008

Table S2. Reported contents of 5hmC in DNA from various species and organs.

Modification	Organisms / Cells	5hmC contents	References	Year
5hmC	E. coli B	0.2% [5hmC/dC]	41	1953
	Crude DNA from E. coli	0.6% [5hmC/dC]		
	Ox.spleen	0.2% [5hmC/dC]		
	Phage T5	1.0% [5hmC/dC]		
	Phage T7	2.7% [5hmC/dC]		
	Crude DNA from phage T7	0.5% [5hmC/dC]		
	Polyhedral virus	2.4% [5hmC/dC]		
	Vaccinia virus	0.6% [5hmC/dC]		
	Meningo-pneumonitis virus	3.9% [5hmC/dC]		
	Mouse brain	3.3% [5hmC/DNA]		1972
	Mouse liver	3.6% [5hmC/DNA]		
	Bullfrog brain	1.28% [5hmC/DNA]		
	Mouse purkinje cells	0.6% [5hmC/DNA]	43	2009
	Mouse granule cells	0.2% [5hmC/DNA]		
5hmC	Mouse Spinal cord	0.46% [5hmC/dG]	44	2010
	Mouse Kidney, nasal epithelia	0.17% [5hmC/dG]		
	Mouse bladder	0.16% [5hmC/dG]		
	Mouse heart, muscle	0.15% [5hmC/dG]		
	Mouse lung	0.14% [5hmC/dG]		
	Mouse Pituitary gland, liver,	0.06% [5hmC/dG]		
	Mouse spleen, testes	0.03% [5hmC/dG]		
	Mouse ES cells	0.39% [5hmC/dG]		2011
	Mouse EB 2 days differentiation	0.2% [5hmC/dG]		
	Mouse EB 3 days differentiation	0.15% [5hmC/dG]		
5hmC	Human heart	0.05% [5hmC/DNA]	46	2011
	Human kidney	0.38% [5hmC/DNA]		
	Human colon	0.45% [5hmC/DNA]		
	Human rectum	0.57% [5hmC/DNA]		
	Human liver	0.46% [5hmC/DNA]		
	Human lung	0.14% [5hmC/DNA]		
	Human breast	0.05% [5hmC/DNA]		
	Human placenta	0.06% [5hmC/DNA]		
	Mouse brain	0.15% [5hmC/DNA]		
	HeLa, HCT116, SW620, AN3CA cells	<0.02% [5hmC/DNA]		
	HEK293	0.009% [5hmC/dC]		2011
	HEK293, Tet2 CD wild type	0.75% [5hmC/dC]		
	HEK293, Tet2 CD mut	0.014% [5hmC/dC]		
	Mouse brain cortex	0.67% [5hmC/dC]		
	Mouse kidney	0.21% [5hmC/dC]		

	Mouse lung	0.16% [5hmC/dC]		
	Mouse heart	0.144% [5hmC/dC]		
	Mouse pancreas	0.093% [5hmC/dC]		
	Mouse liver	0.143% [5hmC/dC]		
	Mouse spleen	0.0575% [5hmC/dC]		
	Mouse thymus	0.0235% [5hmC/dC]		
		0.032% [5hmC/DNA]	47	2009
	Mouse embryonic stem (ES) Cells	0.13% [5hmC/dC]	9	2011
		0.0163 [5hmC/DNA]	8	2013
	HeLa cells	0.0083% [5hmC/dG]		
	293T cells	0.014% [5hmC/dG]		
	Jurkat-T cells	0.0004% [5hmC/dG]		
	Debaryomyces hansenii	0.0088% [5hmC/dG]		
	Kluyveromyces lactis	0.0004% [5hmC/dG]		
	Kluyveromyces marxianus	0.003% [5hmC/dG]		
	Pichia pastoris	0.075% [5hmC/dG]		
	Schizosaccharomyces pombe(CICC 1056)	0.34% [5hmC/dG]		
	Schizosaccharomyces pombe(CICC 1372)	0.26% [5hmC/dG]		
	Yarrowia lipolytica	0.064% [5hmC/dG]		
	HeLa cells	0.00312% [5hmC/DNA]		
	HEK293T-Tet1	0.096% [5hmC/DNA]		
	HEK293T-Tet1m	0.00325% [5hmC/DNA]		
	WM-266-4	0.00122% [5hmC/DNA]		
		0.38-0.54% [5hmC/(dC+5mdC+5hmdC)]	49	2012
	Mouse brain	0.056% [5hmC/DNA]	8	2013
	Mouse skin (red head)	0.0277% [5hmC/DNA]		
	Mouse skin (albino)	0.0217% [5hmC/DNA]		
	Mouse primordial germ cells	0.05-0.2% [5hmC/dC]		
	Mouse somatic cells	0.05-0.2% [5hmC/dC]		
		0.0013% [5hmC/dG]	17	2017
	Mouse ES cells	0.00089% [5hmC/dC]	51	2013
	Mouse ES cells treated with ascorbic acid	0.0033% [5hmC/dC]	51	2013
		0.155% [5hmC/DNA]	8	2013
	Human brain	0.67% [5hmC/DNA]	46	2011
	Arabidopsis thaliana	0.000079% [5hmC/dN]	33	2013
	Human CRC tumor tissues	0.027% [5hmC/dG]		
	Human CRC tumor-adjacent normal tissues	0.0868% [5hmC/dG]	16	2015
	HeLa cells	0.0068% [5hmC/dG]	52	2016

	293T cells	0.0109% [5hmC/dG]		
	NHDF-Neo cells	0.00087% [5hmC/dN]	18	2017
	K562 cells	0.00059% [5hmC/dN]		
	Me45 cells	0.00023% [5hmC/dN]		
	HCT 116 cells	0.00067% [5hmC/dN]		
	Raji cells	0.00013% [5hmC/dN]		
	BL cells	0.0004% [5hmC/dN]		
	Peripheral blood leukocytes	0.0163% [5hmC/dC]	19	2018
	CAD patients	0.0191% [5hmC/dC]		

Table S3. Reported contents of 5fC in DNA from various species and organs.

Modification	Organisms / Cells	5fC contents	References	Year
5fC	Mouse embryonic stem (ES) Cells	0.002% [5fC/dC]	9	2011
		0.02% [5fC/dG]	45	2011
		0.00077% [5fC/dC]	51	2013
		0.00035% [5fC/DNA]	8	2013
		0.0022% [5fC/dG]	17	2017
	HEK293	0.00044% [5fC/dC]	9	2011
	HEK293, Tet2 CD wild type	0.16% [5fC/dC]		
	HEK293, Tet2 CD mut	0.00017% [5fC/dC]		
	Mouse brain cortex	0.0016% [5fC/dC]		
	Mouse kidney	0.0003% [5fC/dC]		
	Mouse lung	0.00037% [5fC/dC]		
	Mouse heart	0.00046% [5fC/dC]		
	Mouse pancreas	0.00059% [5fC/dC]		
	Mouse liver	0.00067% [5fC/dC]		
	Mouse spleen	0.0012% [5fC/dC]		
	Mouse thymus	0.00043% [5fC/dC]		
5fC	Mouse ES cells treated with ascorbic acid	0.00817% [5fC/dC]	51	2013
	<i>Arabidopsis thaliana</i>	0.000079% [5fC/dN]	33	2013
	HEK293T-Tet1	0.0076% [5fC/DNA]	8	2013
	HEK293T-Tet1m	0.000023% [5fC/DNA]		
	HeLa cells	0.000067% [5fC/DNA]		
	WM-266-4	0.000069% [5fC/DNA]		
	Human brain	0.00017% [5fC/DNA]		
5fC	Mouse brain	0.00014% [5fC/DNA]	53	2014
	Mouse skin (red head)	0.00012% [5fC/DNA]		
	Mouse skin (albino)	0.00007% [5fC/DNA]		
	A. thaliana leaves	0.00042% [5fC/dG]		
	G. biloba leaves	0.00028% [5fC/dG]		
	P. orientalis leaves	0.00047% [5fC/dG]		
5fC	O. sativa roots	0.00037% [5fC/dG]	53	2014
	O. sativa stems	0.00022% [5fC/dG]		
	O. sativa leaves	0.00026% [5fC/dG]		
	Z. mays leaves	0.0003% [5fC/dG]		
5fC	Z. mays kernels	0.00031% [5fC/dG]	53	2014
	Z. mays silks	0.0004% [5fC/dG]		
	L. esculentum stems	0.00044% [5fC/dG]		
	L. esculentum leaves	0.00021% [5fC/dG]		

	Human CRC tumor tissues	0.000092% [5fC/dG]	16	2015
	Human CRC tumor-adjacent normal tissues	0.000274% [5fC/dG]		
	293T cells	0.00045% [5fC/dG]	52	2016
	HeLa cells	0.00191% [5fC/dG]		
	NHDF-Neo cells	0.098/10 <sup>6</sup> [5fC/dN]	18	2017
	K562 cells	0.042/10 <sup>6</sup> [5fC/dN]		
	Me45 cells	0.044/10 <sup>6</sup> [5fC/dN]		
	HCT 116 cells	0.082/10 <sup>6</sup> [5fC/dN]		
	Raji cells	0.043/10 <sup>6</sup> [5fC/dN]		
	BL cells	0.013/10 <sup>6</sup> [5fC/dN]		
	293T cells	0.7/10 <sup>6</sup> [5fC/DNA]		
	HeLa cells	0.2/10 <sup>6</sup> [5fC/DNA]	54	2017
	MCF-7 cells	0.2/10 <sup>6</sup> [5fC/DNA]		
	Rat tissues (Liver, Brain, Kidney, Lung)	0.7-1.6/10 <sup>6</sup> [5fC/DNA]		

Table S4. Reported contents of 5caC in DNA from various species and organs.

Modification	Organisms / Cells	5caC contents	References	Year
5caC	Mouse embryonic stem (ES) Cells	0.0003% [5caC/dC]	9	2011
		0.000083% [5caC/DNA]	8	2013
		0.0003% [5caC/dG]	17	2017
	HEK293, Tet2 CD wild type	0.052% [5caC/dC]	9	2011
	<i>Arabidopsis. thaliana</i>	0.000078 [5caC/dN]	33	2013
	HEK293T-Tet1	0.0102% [5caC/DNA]	8	2013
	HEK293T-Tet1m	0.000018% [5caC/DNA]		
	HeLa cells	0.000027% [5caC/DNA]		
	WM-266-4	0.000029% [5caC/DNA]		
	Human brain	0.000015% [5caC/DNA]		
	Mouse brain	0.000012% [5caC/DNA]		
	Mouse skin (red head)	0.000021% [5caC/DNA]		
	Mouse skin (albino)	0.000019% [5caC/DNA]		
	A. thaliana leaves	0.00034% [5caC/dG]	53	2014
	G. biloba leaves	0.00019% [5caC/dG]		
	P. orientalis leaves	0.00036% [5caC/dG]		
	O. sativa roots	0.00009% [5caC/dG]		
	O. sativa stems	0.00003% [5caC/dG]		
	O. sativa leaves	0.00002% [5caC/dG]		
	Z. mays leaves	0.00002% [5caC/dG]		
	Z. mays kernels	0.00006% [5caC/dG]		
	Z. mays silks	0.00003% [5caC/dG]		
	L. esculentum stems	0.00004% [5caC/dG]		
	L. esculentum leaves	0.00004% [5caC/dG]	16	2015
	Human CRC tumor tissues	0.000009% [5caC/dG]		
	Human CRC tumor-adjacent normal tissues	0.000031% [5caC/dG]		

Table S5. Reported contents of 6mA in DNA from various species and organs.

Modification	Organisms / Cells	6mA contents	References	Year
6mA	T. thermophila	0.8% [6mA/dA]	55	1982
	Mycobacterium smegmatis	3% [6mA/dA]	56	1983
	Mealybug	2.3% [6mA/dA]		
	Bacteriophage λ wt	0.14% [6mA/dA]		
	E. coli	0.33% [6mA/dA]	57	2010
	H. magnipapillata	0.41% [6mA/dA]		
	Chlamydomonas	0.3% -0.5% [6mA/dA]	58	2015
	C. elegans	0.01%-0.4% [6mA/dA]	59	2015
	Drosophila embryos	0.001% -0.07% [6mA/dA]		
	Drosophila brain	0.00095% [6mA/dA]	60	2015
	Drosophila ovary	0.00055% [6mA/dA]		
	Human 293T cells	0.00017% [6mA/dA]		
	Human Jurkat-T cells	0.00023% [6mA/dA]		
	Rat heart	0.00032% [6mA/dA]		
	Rat liver	0.00013% [6mA/dA]		
	Rat spleen	0.00009% [6mA/dA]		
	Rat lung	0.00008% [6mA/dA]		
	Rat kidney	0.00006% [6mA/dA]		
	Rat brain	0.00013% [6mA/dA]		
	Rat subcutis	0.00013% [6mA/dA]		
6mA	Leaves of Oryza sativa	0.00077% [6mA/dA]		
	Kernels of Zea mays	0.00015% [6mA/dA]		
	Xenopus laevis sperm	0.00009% [6mA/dA]	62	2016
	Zebrafis sperm	0.003% [6mA/dA]		
	Zebrafis oocyte	0.015% [6mA/dA]		
	Zebrafis brain	0.0026% [6mA/dA]		
	Zebrafis eye	0.0024% [6mA/dA]		
	Zebrafis heart	0.004% [6mA/dA]		
	Zebrafis ovary	0.0034% [6mA/dA]		
	Zebrafis testis	0.002% [6mA/dA]		
	Zebrafis muscle	0.004% [6mA/dA]		
	Zebrafis intestine	0.0032% [6mA/dA]	63	2016
	Pig sperm	0.015% [6mA/dA]		
	Pig oocyte	0.09% [6mA/dA]		
	Pig 4-Cell	0.018% [6mA/dA]		
	Pig morula	0.017% [6mA/dA]		
	Pig biastocyst	0.04% [6mA/dA]		
	Pig brain	0.0032% [6mA/dA]		
	Pig liver	0.0015% [6mA/dA]		
	Pig muscle	0.002% [6mA/dA]		

Pig stomach	0.007% [6mA/dA]		
Pig ovary	0.006% [6mA/dA]		
Pig kidney	0.001% [6mA/dA]		
Pig lung	0.0009% [6mA/dA]		
Pig spleen	0.001% [6mA/dA]		
Pig heart	0.0008% [6mA/dA]		
Pig colon	0.0014% [6mA/dA]		
Mouse brain	0.00024% [6mA/dA]		
Mouse kidney	0.00019% [6mA/dA]		
Mouse thymus	0.00038% [6mA/dA]		
Mouse embryonic stem cells	0.0006% -0.0007% [6mA/dA]		
C. reinhardtii	0.4% -0.6% [6mA/dA]	65	2016
Synechocystis	0.84% [6mA/dA]		
Chlamydomonas reinhardtii (CC-3491)	0.084% [6mA/dA]	66	2017
Chlamydomonas reinhardtii (wt7d+)	0.064% [6mA/dA]		
Human	0.051% [6mA/dA]	67	2018
Drosophila brain	0.0026% [6mA/dA]	68	2018
Human Astrocytes	0.0003% [6mA/dA]		
Glioma Stem Cell	0.1% [6mA/dA]	69	2018
Arabidopsis root	0.138% [6mA/dA]		
Arabidopsis seedling	0.045% [6mA/dA]		
Arabidopsis rosette leaves	0.006% [6mA/dA]		
Arabidopsis cauline leaves	0.08% [6mA/dA]		
Arabidopsis stem	0.012% [6mA/dA]	70	2018
Arabidopsis open flower	0.018% [6mA/dA]		
Arabidopsis flower buds	0.012% [6mA/dA]		
Arabidopsis siliques	0.025% [6mA/dA]		
Rice	0.24% [6mA/dA]	71	2018
Oxytricha	0.71% [6mA/(6mA+dA)]		
Tetrahymena	0.61% [6mA/(6mA+dA)]	72	2019
Mouse	0.00085% [6mA/dA]	73	2019
GW5100 E.coli cells	0.108% [6mA/dA]		
HEK293T cells	0.00012% [6mA/dA]		
HeLa cells	0.00048% [6mA/dA]		
Male rats brain	0.0003% [6mA/dA]		
Male rats pancreas	0.00012% [6mA/dA]		
Male rats lung	0.0001% [6mA/dA]		
Male rats spleen	0.00008% [6mA/dA]	74	2019
Male rats heart	0.00022% [6mA/dA]		
Male rats liver	0.00014% [6mA/dA]		
Male rats thymus	0.00012% [6mA/dA]		
Male rats kidney	0.0001% [6mA/dA]		
Mealybug	2.3% [6mA/dA]		

Table S6. Reported contents of 6hmA in DNA from various species and organs.

Modification	Organisms / Cells	6hmA contents	References	Year
6hmA	HEK293T cells	0.00011% [6hmA/dA]	74	2019
	HeLa cells	0.00009% [6hmA/dA]		
	Male rats brain	0.00013% [6hmA/dA]		
	Male rats pancreas	0.000122% [6hmA/dA]		
	Male rats lung	0.000115% [6hmA/dA]		
	Male rats spleen	0.00011% [6hmA/dA]		
	Male rats heart	0.000105% [6hmA/dA]		
	Male rats liver	0.00008% [6hmA/dA]		
	Male rats thymus	0.000075% [6hmA/dA]		
	Male rats kidney	0.00007% [6hmA/dA]		

Table S7. Reported contents of 5hmU in DNA from various species and organs.

<b>Modification</b>	<b>Organisms / Cells</b>	<b>5hmU contents</b>	<b>References</b>	<b>Year</b>
5hmU	Women Breast	0.00675% [5mU/T]	75	2001
	HeLa cells	0.0003% [5mU/dN]	76	2013
	WM-266-4 human melanoma cells	0.00034% [5mU/dN]		
	Human brain tissues	0.00039% [5mU/dN]		
	Mouse brain tissues	0.00083% [5mU/dN]		
	Mouse skin tissues	0.00064% [5mU/dN]		
	mESCs	0.00005% [5hmU/dN]	77	2014
	Pig liver	0.00006% [5mU/dN]	78	2014
	Pig brain	0.00013% [5mU/dN]		
	Trypanosoma brucei	0.00425% [5mU/dN]	79	2014
	Human leukocytes	0.0000492% [5mU/dN]	80	2014
	Human Sperm	0.0005209% [5mU/dN]		
	Pig liver	0.00002025% [5mU/dN]	81	2015
	Pig kidney	0.00001225% [5mU/dN]		
	Pig brain	0.00001102% [5mU/dN]		
	Pig thymus	0.00001042% [5mU/dN]		
	Pig lymph nodes	0.00004565% [5mU/dN]		
	Pig spleen	0.00001765% [5mU/dN]		
	Pig heart	0.00003614% [5mU/dN]		
	Pig intestine	0.00006251% [5mU/dN]		
	Pig muscle	0.00001439% [5mU/dN]		
	Male Wistar rat liver	0.00001439% [5mU/dN]		
	Male Wistar rat kidney	0.00001570% [5mU/dN]		
	Male Wistar rat thymus	0.00002770% [5mU/dN]		
	Male Wistar rat heart	0.00003045% [5mU/dN]		
	Male Wistar rat intestine	0.00001789% [5mU/dN]		
	Male Wistar rat lung	0.00001483% [5mU/dN]		
	Male Wistar rat brain	0.00001090% [5mU/dN]		

Table S8. Reported contents of base J in DNA from various species and organs.

<b>Modification</b>	<b>Organisms / Cells</b>	<b>base J contents</b>	<b>References</b>	<b>Year</b>
Base J	<i>T. brucei</i>	0.1% [Base J/dN]	82	1993
	<i>T. brucei</i>	0.23% [Base J/dN]	83	1996
	<i>T. brucei</i>	0.12% [Base J/dN]	84	1998
	<i>L. donovani</i>	0.02-0.04% [Base J/dN]		
	<i>T. cruzi</i>	0.02-0.04% [Base J/dN]		
	<i>C. fasciculata</i>	0.08% [Base J/dN]		
	<i>T. borreli</i>	0.04% [Base J/dN]		
	Nuclear DNA of <i>Euglena gracilis</i>	0.2% [Base J/dN]	85	2000
	<i>T. brucei</i>	0.155% [Base J/dN]	86	2014
	<i>Leishmania major</i>	0.08% [Base J/dN]	87	2017

Table S9. Reported contents of 4mC in DNA from various species and organs.

Modification	Organisms / Cells	4mC contents	References	Year
4mC	<i>B. aneurinolyticus</i>	0.06% [4mC/dN]	88	1987
	<i>F. nucleatum</i>	<0.01% [4mC/dN]		
	<i>H. gallinarum</i>	<0.01% [4mC/dN]		
	<i>H. influenzae Rd</i>	<0.02% [4mC/dN]		
	<i>K. pneumoniae</i>	<0.02% [4mC/dN]		
	<i>M. nonliquefaciens</i>	<0.01% [4mC/dN]		
	<i>N. aerocolonigenes</i>	<0.01% [4mC/dN]		
	<i>R. sphaeroides</i>	0.16% [4mC/dN]		
	<i>S. pneumoniae</i>	<0.01% [4mC/dN]		
	<i>S. achromogenes</i>	<0.01% [4mC/dN]		
	<i>X. campestris</i> pv. <i>badrii</i>	0.04% [4mC/dN]		
	<i>Clostridium thermocellum</i> (JW20)	<0.01% [4mC/dN]		
	<i>Clostridium thermoaceticum</i> (72 and ATCC 39073)	0.20% [4mC/dN]		
	<i>Clostridium thermoautotrophicum</i> (701/3)	0.07% [4mC/dN]		
	<i>Clostridium thermoautotrophicum</i> (701/5)	<0.02% [4mC/dN]		
	<i>Clostridium thermosaccharolyticum</i>	<0.02% [4mC/dN]		
	<i>Clostridium sp.</i> (RB1, RB9)	0.05% [4mC/dN]		
	<i>Desulfotomaculum nigrificans</i>	0.10% [4mC/dN]		
	<i>Bacillus stearothermophilus</i> (H3) <sup>b</sup>	0.39% [4mC/dN]		
	<i>Methanobacterium formicum</i>	<0.01% [4mC/dN]		
	<i>Methanococcus voltae</i>	<0.01% [4mC/dN]		
	<i>Methanococcus delta</i>	<0.01% [4mC/dN]		
	<i>Clostridium aceticum</i>	<0.01% [4mC/dN]		
	<i>Acetobacterium woodii</i>	<0.01% [4mC/dN]		
	<i>Desulfovibrto</i> sp.	<0.01% [4mC/dN]	89	1985
	<i>Desulfovibrio</i> species	<0.03% [4mC/dN]		
	<i>D. Vulgaris</i> (Hildenborough)	<0.01% [4mC/dN]		
	<i>Escherichia coli</i> B <sup>c</sup>	<0.01% [4mC/dN]		
	<i>Micrococcus luteus</i>	<0.01% [4mC/dN]		
	<i>C.kristjanssonii</i>	0.23% [4mC/dC] (Mass spectrometry)		
C.kristjanssonii		0.53% [4mC/dC] (Deep sequencing)	90	2015

Table S10. Reported contents of 8-oxo-G in DNA from various species and organs.

<b>Modification</b>	<b>Organisms / Cells</b>	<b>8-oxo-G contents</b>	<b>References</b>	<b>Year</b>
8-oxo-G	Human leukocytes	0.00033% [8-oxo-G /dG)	91	1990
	Calf thymus	0.06528% [8-oxo-G /dN)	92	1991
	Human brain	0.00136% [8-oxo-G /dN)	93	1992
	Human lung	0.00968% [8-oxo-G /dN)		
	Human colon	0.00271% [8-oxo-G /dN)		
	Human stomach	0.00094% [8-oxo-G /dN)		
	Human ovary	0.00311% [8-oxo-G /dN)		
	Non-cancerous breast tissues	0.0051% [8-oxo-G /dG)	94	1995
	Breast cancer tissues.	0.0036% [8-oxo-G /dG)		
	Normal breast tissue	0.008% [8-oxo-G /dN)	95	1996
	Benign tumors breast tissue	0.03136% [8-oxo-G /dN)		
	Malignant breast tissue	0.07808% [8-oxo-G /dN)		
	Human leukocytes	0.00031% [8-oxo-G /dG)	96	1996
	Lymphocyte	0.00374% [8-oxo-G /dG)	97	1996
	Children Human lymphocytes	0.008608% [8-oxo-G /dN)	98	1997
	Human lung tissue	0.00052% [8-oxo-G /dG)	99	1997
	Lung cancer tissues	0.00052% [8-oxo-G /dG)	100	1998
	Squamous cell carcinoma lung tissues	0.00052% [8-oxo-G /dG)		
	Adenocarcinoma lung tissues	0.00051% [8-oxo-G /dG)		
	Normal lung tissues	0.00037% [8-oxo-G /dG)		
	Human leukocytes	0.0034% [8-oxo-G /dG)	101	1999
	Non-cancerous breast tissues	0.00134% [8-oxo-G /dG)	102	2000
	Breast cancer tissues.	0.00207% [8-oxo-G /dG)		
	Human leukocytes	0.00153% [8-oxo-G /dG)	103	2000
	Lung tumors	0.00077% [8-oxo-G /dG)	104	2000
	Normal lung tissues	0.00081% [8-oxo-G /dG)		
	Mouse liver nDNA	0.000032% [8-oxo-G /dG)	105	2001
	Mouse liver mtDNA	0.000194% [8-oxo-G /dG)		
	Mouse brain nDNA	0.000015% [8-oxo-G /dG)		
	Mouse brain mtDNA	0.000342% [8-oxo-G /dG)		
	Mouse heart nDNA	0.00002% [8-oxo-G /dG)		
	Mouse heart mtDNA	0.000324% [8-oxo-G /dG)		
	HCC peritumoral	0.018% [8-oxo-G /dG)	106	2001
	HCC tumor	0.0032% [8-oxo-G /dG)		
	Non-HCC peritumoral	0.0039% [8-oxo-G /dG)		
	Non-HCC tumor	0.0108% [8-oxo-G /dG)		
	Normal Human lymphocytes	0.00098% [8-oxo-G /dG)	107	2001
	Atherosclerotic patient Human lymphocytes	0.001278% [8-oxo-G /dG)		
	Pig live	0.001048% [8-oxo-G /dG)	108	2002

	HeLa cells	0.000523% [8-oxo-G /dG)		
	HeLa cells	0.000079% [8-oxo-G /dG)		
	Lymphocyte cell line	0.00005% [8-oxo-G /dN)	109	2002
	HeLa cells	0.00401% [8-oxo-G /dG)	110	2003
	Larynx tumor	0.00195% [8-oxo-G /dN)		
	Larynx adjacent tissues	0.00205% [8-oxo-G /dN)	111	2003
	Fibroblast cell line	0.00005% [8-oxo-G /dG)	112	2004
	Human leukocytes	0.00031% [8-oxo-G /dG)	113	2004
	Kidney tissue	0.1079% [8-oxo-G /dG)	114	2004
	Cultured cells	0.00003% [8-oxo-G /dG)	115	2004
	Mouse brain cortices	0.002219% [8-oxo-G /dG)	116	2004
	HeLa cells	0.00004% [8-oxo-G /dG)	117	2004
	Human lymphocytes	0.000424% [8-oxo-G /dG)		
	Human lymphocyte	0.000373% [8-oxo-G /dG)		
	HeLa cells	0.000278% [8-oxo-G /dG)	118	2005
	HeLa cells	0.00005% [8-oxo-G /dG)		
	CD4+ T-cells	0.004% [8-oxo-G /dG)	119	2005
	Normal tissue, lung cancer patients	0.001% [8-oxo-G /dG)	120	2005
	Mononucleocytes	0.00049% [8-oxo-G /dG)	121	2005
	Human leukocytes	0.0006% [8-oxo-G /dG)	122	2005
	Human lymphocytes	0.00002% [8-oxo-G /dG)	123	2006
	Human leukocytes	0.00048% [8-oxo-G /dG)	124	2007
	Human leukocytes	0.0012% [8-oxo-G /dG)	125	2007
	mESCs	0.0005% [8-oxo-G /dN)	77	2014
	Pig liver,	0.00013% [8-oxo-G /dN)		
	Pig brain	0.00012% [8-oxo-G /dN)	78	2014
	Escherichia coli	0.00081% [8-oxo-G /dN)		
	Mouse lungs	0.0042% [8-oxo-G /dG)	126	2015
	Retinal pigment epithelium mtDNA	0.017% [8-oxo-G /dN)		
	Retinal pigment epithelium nuclear DNA	0.000054% [8-oxo-G /dN)	127	2016
	HepG2 cells	0.00022% [8-oxo-G /dG)		
	T24 cells	0.00113% [8-oxo-G /dG)	128	2016
	Sprague-Dawley rat hepatic	0.000265% [8-oxo-G /dG)	129	2016
	Newborn mice brain tissues	1.2% [8-oxo-G /dG)	130	2017
	CHO_APP_iMTH1 cells.	0.000653% [8-oxo-G /dG)	131	2018
	MCF10A cells,	0.00025% [8-oxo-G /dG)	132	2019

Table S11. Reported contents of 5gmC in DNA from various species and organs.

Modification	Organisms / Cells	5gmC contents	References	Year
5gmC	<i>Chlamydomonas reinhardtii</i>	0.001% [5gmC/dC]	133	2019

Table S12. Reported contents of 5fU in DNA from various species and organs.

Modification	Organisms / Cells	5fU contents	References	Year
5fU	mESCs	0.0002% [5fU/dN]	77	2014
	Human thyroid carcinoma tissues	0.001% [5fU/dN]	54	2017

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