

**Table S1** – Allele and genotype frequencies in thyroid cancer patients submitted to <sup>131</sup>I therapy (n=26) and in the reference DTC population (n=106).

| Genotype                                | Reference DTC      |                    | Study sample  |                    |                |                    |              |                    |
|-----------------------------------------|--------------------|--------------------|---------------|--------------------|----------------|--------------------|--------------|--------------------|
|                                         | population (n=106) |                    |               |                    |                |                    |              |                    |
|                                         |                    |                    | 70 mCi (n=15) |                    | 100 mCi (n=11) |                    | TOTAL (n=26) |                    |
|                                         | Genotype           |                    | Genotype      |                    | Genotype       |                    | Genotype     |                    |
|                                         | MAF                | frequency<br>n (%) | MAF           | frequency<br>n (%) | MAF            | frequency<br>n (%) | MAF          | frequency<br>n (%) |
| <b><i>MLH1</i> rs1799977</b>            |                    |                    |               |                    |                |                    |              |                    |
| Ile/Ile                                 | G: 0.30            | 48 (45.7)          | G: 0.30       | 7 (46.7)           | G: 0.45        | 3 (27.3)           | G: 0.37      | 10 (38.5)          |
| Ile/Val                                 |                    | 50 (47.6)          |               | 7 (46.7)           |                | 6 (54.5)           |              | 13 (50.0)          |
| Val/Val                                 |                    | 7 (6.7)            |               | 1 (6.7)            |                | 2 (18.2)           |              | 3 (11.5)           |
| Ile/Val+Val/Val                         |                    | 57 (54.3)          |               | 8 (53.3)           |                | 8 (72.7)           |              | 16 (61.5)          |
| <b><i>MSH3</i> rs26279 <sup>a</sup></b> |                    |                    |               |                    |                |                    |              |                    |
| Thr/Thr                                 | G: 0.33            | 48 (45.7)          | G: 0.23       | 10 (66.7)          | G: 0.14        | 8 (72.7)           | G: 0.19      | 18 (69.2)          |
| Thr/Ala                                 |                    | 45 (42.9)          |               | 3 (20.0)           |                | 3 (27.3)           |              | 6 (23.1)           |
| Ala/Ala                                 |                    | 12 (11.4)          |               | 2 (13.3)           |                | 0 (0.0)            |              | 2 (7.7)            |
| Thr/Ala+Ala/Ala                         |                    | 57 (54.3)          |               | 5 (33.3)           |                | 3 (27.3)           |              | 8 (30.8)           |
| <b><i>MSH3</i> rs184967</b>             |                    |                    |               |                    |                |                    |              |                    |
| Arg/Arg                                 | A: 0.15            | 80 (75.5)          | A: 0.10       | 13 (86.7)          | A: 0.14        | 8 (72.7)           | A: 0.12      | 21 (80.8)          |
| Arg/Gln                                 |                    | 21 (19.8)          |               | 1 (6.7)            |                | 3 (27.3)           |              | 4 (15.4)           |
| Gln/Gln                                 |                    | 5 (4.7)            |               | 1 (6.7)            |                | 0 (0.0)            |              | 1 (3.8)            |
| Arg/Gln+Gln/Gln                         |                    | 26 (24.5)          |               | 2 (13.3)           |                | 3 (27.3)           |              | 5 (19.2)           |
| <b><i>MSH4</i> rs5745549</b>            |                    |                    |               |                    |                |                    |              |                    |

|                                         |         |           |         |           |         |           |         |           |
|-----------------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Ser/Ser                                 | A: 0.07 | 92 (86.8) | A: 0.03 | 14 (93.3) | A: 0.14 | 8 (72.7)  | A: 0.08 | 22 (84.6) |
| Ser/Asn                                 |         | 14 (13.2) |         | 1 (6.7)   |         | 3 (27.3)  |         | 4 (15.4)  |
| Asn/Asn                                 |         | 0 (0.0)   |         | 0 (0.0)   |         | 0 (0.0)   |         | 0 (0.0)   |
| Ser/Asn+Asn/Asn                         |         | 14 (13.2) |         | 1 (6.7)   |         | 3 (27.3)  |         | 4 (15.4)  |
| <b><i>MSH4</i> rs5745325</b>            |         |           |         |           |         |           |         |           |
| Ala/Ala                                 | A: 0.27 | 57 (53.8) | A: 0.13 | 11 (73.3) | A: 0.32 | 4 (36.4)  | A: 0.21 | 15 (57.7) |
| Ala/Thr                                 |         | 40 (37.7) |         | 4 (26.7)  |         | 7 (63.6)  |         | 11 (42.3) |
| Thr/Thr                                 |         | 9 (8.5)   |         | 0 (0.0)   |         | 0 (0.0)   |         | 0 (0.0)   |
| Ala/Thr+Thr/Thr                         |         | 49 (46.2) |         | 4 (26.7)  |         | 7 (63.6)  |         | 11 (42.3) |
| <b><i>PMS1</i> rs5742933</b>            |         |           |         |           |         |           |         |           |
| G/G                                     | C: 0.17 | 73 (70.2) | C: 0.18 | 10 (71.4) | C: 0.14 | 9 (81.8)  | C: 0.16 | 19 (76.0) |
| G/C                                     |         | 27 (26.0) |         | 3 (21.4)  |         | 1 (9.1)   |         | 4 (16.0)  |
| C/C                                     |         | 4 (3.8)   |         | 1 (7.1)   |         | 1 (9.1)   |         | 2 (8.0)   |
| G/C+C/C                                 |         | 31 (29.8) |         | 4 (28.6)  |         | 2 (18.2)  |         | 6 (24.0)  |
| <b><i>MLH3</i> rs175080<sup>b</sup></b> |         |           |         |           |         |           |         |           |
| Leu/Leu                                 | G: 0.49 | 25 (23.6) | G: 0.30 | 7 (46.7)  | A: 0.32 | 1 (9.1)   | G: 0.46 | 8 (30.8)  |
| Leu/Pro                                 |         | 59 (55.7) |         | 7 (46.7)  |         | 5 (45.5)  |         | 12 (46.2) |
| Pro/Pro                                 |         | 22 (20.8) |         | 1 (6.7)   |         | 5 (45.5)  |         | 6 (23.1)  |
| Leu/Pro+ Pro/Pro                        |         | 81 (76.4) |         | 8 (53.3)  |         | 10 (90.9) |         | 18 (69.2) |
| <b><i>MSH6</i> rs1042821</b>            |         |           |         |           |         |           |         |           |
| Gly/Gly                                 | T: 0.22 | 68 (64.2) | T: 0.17 | 10 (66.7) | T: 0.09 | 9 (81.8)  | T: 0.13 | 19 (73.1) |
| Gly/Glu                                 |         | 30 (28.3) |         | 5 (33.3)  |         | 2 (18.2)  |         | 7 (26.9)  |
| Glu/Glu                                 |         | 8 (7.5)   |         | 0 (0.0)   |         | 0 (0.0)   |         | 0 (0.0)   |
| Gly/Glu+Glu/Glu                         |         | 38 (35.8) |         | 5 (33.3)  |         | 2 (18.2)  |         | 7 (26.9)  |

|                               |         |           |          |           |          |            |          |           |
|-------------------------------|---------|-----------|----------|-----------|----------|------------|----------|-----------|
| <b><i>RAD51</i> rs1801321</b> |         |           |          |           |          |            |          |           |
| T/T                           | G: 0.50 | 28 (26.4) | G: 0.50  | 4 (26.7)  | G: 0.45  | 4 (36.4)   | G: 0.48  | 8 (30.8)  |
| T/G                           |         | 50 (47.2) |          | 7 (46.7)  |          | 4 (36.4)   |          | 11 (42.3) |
| G/G                           |         | 28 (26.4) |          | 4 (26.7)  |          | 3 (27.3)   |          | 7 (26.9)  |
| T/G+G/G                       |         | 78 (73.6) |          | 11 (73.3) |          | 7 (63.6)   |          | 18 (69.2) |
| <b><i>NBN</i> rs1805794</b>   |         |           |          |           |          |            |          |           |
| Glu/Glu                       | C: 0.28 | 55 (51.9) | C : 0.30 | 7 (46.7)  | C : 0.14 | 8 (72.7)   | C : 0.23 | 15 (57.7) |
| Glu/Gln                       |         | 43 (40.6) |          | 7 (46.7)  |          | 3 (27.3)   |          | 10 (38.5) |
| Gln/Gln                       |         | 8 (7.5)   |          | 1 (6.7)   |          | 0 (0.0)    |          | 1 (3.8)   |
| Glu/Gln+Gln/Gln               |         | 51 (48.1) |          | 8 (53.3)  |          | 3 (27.3)   |          | 11 (42.3) |
| <b><i>XRCC2</i> rs3218536</b> |         |           |          |           |          |            |          |           |
| Arg/Arg                       | A: 0.07 | 92 (86.8) | A: 0.10  | 12 (80.0) | A: 0.00  | 11 (100.0) | A: 0.06  | 23 (88.5) |
| Arg/His                       |         | 14 (13.2) |          | 3 (20.0)  |          | 0 (0.0)    |          | 3 (11.5)  |
| His/His                       |         | 0 (0.0)   |          | 0 (0.0)   |          | 0 (0.0)    |          | 0 (0.0)   |
| Arg/His+His/His               |         | 14 (13.2) |          | 3 (20.0)  |          | 0 (0.0)    |          | 3 (11.5)  |
| <b><i>XRCC3</i> rs861539</b>  |         |           |          |           |          |            |          |           |
| Thr/Thr                       | T: 0.45 | 36 (34.0) | C: 0.47  | 5 (33.3)  | T: 0.36  | 5 (45.5)   | T: 0.46  | 10 (38.5) |
| Thr/Met                       |         | 44 (41.5) |          | 4 (26.7)  |          | 4 (36.4)   |          | 8 (30.8)  |
| Met/Met                       |         | 26 (24.5) |          | 6 (40.0)  |          | 2 (18.2)   |          | 8 (30.8)  |
| Thr/Met+Met/Met               |         | 70 (66.0) |          | 10 (66.7) |          | 6 (54.5)   |          | 16 (61.5) |
| <b><i>XRCC4</i> rs1805377</b> |         |           |          |           |          |            |          |           |
| G/G                           | A: 0.08 | 90 (84.9) | A: 0.10  | 12 (80.0) | A: 0.05  | 10 (90.9)  | A: 0.08  | 22 (84.6) |
| G/A                           |         | 15 (14.2) |          | 3 (20.0)  |          | 1 (9.1)    |          | 4 (15.4)  |
| A/A                           |         | 1 (0.9)   |          | 0 (0.0)   |          | 0 (0.0)    |          | 0 (0.0)   |

|                         |         |           |         |           |         |            |         |           |
|-------------------------|---------|-----------|---------|-----------|---------|------------|---------|-----------|
| G/A+A/A                 |         | 16 (15.1) |         | 3 (20.0)  |         | 1 (9.1)    |         | 4 (15.4)  |
| <b>LIG4 rs1805388</b>   |         |           |         |           |         |            |         |           |
| Thr/Thr                 | T: 0.14 | 81 (76.4) | T: 0.10 | 12 (80.0) | T: 0.09 | 9 (81.8)   | T: 0.10 | 21 (80.8) |
| Thr/Ile                 |         | 21 (19.8) |         | 3 (20.0)  |         | 2 (18.2)   |         | 5 (19.2)  |
| Ile/Ile                 |         | 4 (3.8)   |         | 0 (0.0)   |         | 0 (0.0)    |         | 0 (0.0)   |
| Thr/Ile+Ile/Ile         |         | 25 (23.6) |         | 3 (20.0)  |         | 2 (18.2)   |         | 5 (19.2)  |
| <b>XRCC4 rs28360135</b> |         |           |         |           |         |            |         |           |
| Ile/Ile                 | C: 0.06 | 94 (88.7) | C: 0.07 | 13 (86.7) | C: 0.00 | 11 (100.0) | C: 0.04 | 24 (92.3) |
| Ile/Thr                 |         | 12 (11.3) |         | 2 (13.3)  |         | 0 (0.0)    |         | 2 (7.7)   |
| Thr/Thr                 |         | 0 (0.0)   |         | 0 (0.0)   |         | 0 (0.0)    |         | 0 (0.0)   |
| Ile/Thr+Thr/Thr         |         | 12 (11.3) |         | 2 (13.3)  |         | 0 (0.0)    |         | 2 (7.7)   |
| <b>XRCC5 rs1051685</b>  |         |           |         |           |         |            |         |           |
| A/A                     | G: 0.09 | 89 (84.0) | G: 0.03 | 14 (93.3) | G: 0.09 | 9 (81.8)   | G: 0.06 | 23 (88.5) |
| A/G                     |         | 15 (14.2) |         | 1 (6.7)   |         | 2 (18.2)   |         | 3 (11.5)  |
| G/G                     |         | 2 (1.9)   |         | 0 (0.0)   |         | 0 (0.0)    |         | 0 (0.0)   |
| A/G+G/G                 |         | 17 (16.0) |         | 1 (6.7)   |         | 2 (18.2)   |         | 3 (11.5)  |
| <b>XRCC5 rs1051677</b>  |         |           |         |           |         |            |         |           |
| T/T                     | C: 0.13 | 79 (74.5) | C: 0.17 | 11 (73.3) | C: 0.18 | 7 (63.6)   | C: 0.17 | 18 (69.2) |
| T/C                     |         | 26 (24.5) |         | 3 (20.0)  |         | 4 (36.4)   |         | 7 (26.9)  |
| C/C                     |         | 1 (0.9)   |         | 1 (6.7)   |         | 0 (0.0)    |         | 1 (3.8)   |
| T/C+C/C                 |         | 27 (25.5) |         | 4 (26.7)  |         | 4 (36.4)   |         | 8 (30.8)  |
| <b>XRCC5 rs6941</b>     |         |           |         |           |         |            |         |           |
| C/C                     | A: 0.13 | 78 (75.0) | A: 0.17 | 11 (73.3) | A: 0.17 | 6 (66.7)   | A: 0.17 | 17 (70.8) |
| C/A                     |         | 25 (24.0) |         | 3 (20.0)  |         | 3 (33.3)   |         | 6 (25.0)  |

|         |           |          |          |          |
|---------|-----------|----------|----------|----------|
| A/A     | 1 (1.0)   | 1 (6.7)  | 0 (0.0)  | 1 (4.2)  |
| C/A+A/A | 26 (25.0) | 4 (26.7) | 3 (33.3) | 7 (29.2) |

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***XRCC5* rs2440**

|         |         |           |         |           |         |          |         |           |
|---------|---------|-----------|---------|-----------|---------|----------|---------|-----------|
| T/T     | T: 0.45 | 20 (19.2) | C: 0.47 | 5 (33.3)  | C: 0.50 | 2 (22.2) | C: 0.48 | 7 (29.2)  |
| T/C     |         | 54 (51.9) |         | 6 (40.0)  |         | 5 (55.6) |         | 11 (45.8) |
| C/C     |         | 30 (28.8) |         | 4 (26.7)  |         | 2 (22.2) |         | 6 (25.0)  |
| T/C+C/C |         | 84 (80.8) |         | 10 (66.7) |         | 7 (77.8) |         | 17 (70.8) |

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All comparisons of genotype distributions were performed by the two-sided Fisher's exact test (whenever 2x2 contingency tables are possible) or the  $\chi^2$  test (remaining cases). <sup>a</sup>  $p < 0.05$  for the comparison of genotype distributions (dominant model) in the reference DTC population *versus* that in the study sample (70 mCi + 100 mCi groups combined). <sup>b</sup>  $p < 0.05$  for the comparison of genotype distributions (codominant model) in the 70 mCi group *versus* that in the 100 mCi group. No further significant differences were found. MAF, minor allele frequency.

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**Table S2** – BNMN frequency (%o, mean  $\pm$  S.D.) in DTC patients before and after (1, 3/6 and 24 months) therapy with different doses of  $^{131}\text{I}$  (70 and 100 mCi).

|                | n <sup>a</sup> | t <sub>0</sub>                      | t <sub>1</sub>                          | t <sub>3</sub>                            | t <sub>6</sub>                     | t <sub>24</sub>                     |
|----------------|----------------|-------------------------------------|-----------------------------------------|-------------------------------------------|------------------------------------|-------------------------------------|
| <b>70 mCi</b>  | 15             | 5.27 $\pm$ 3.63                     | <b>8.80 <math>\pm</math> 4.65*</b>      | --                                        | <b>8.93 <math>\pm</math> 5.92*</b> | <b>9.64 <math>\pm</math> 2.80**</b> |
| <b>100 mCi</b> | 11             | <b>9.64 <math>\pm</math> 4.78 ‡</b> | <b>17.27 <math>\pm</math> 5.14* ‡ ‡</b> | <b>21.40 <math>\pm</math> 5.66*** ‡ ‡</b> | --                                 | --                                  |
| <b>TOTAL</b>   | 26             | 7.12 $\pm$ 4.63                     | <b>12.38 <math>\pm</math> 6.39**</b>    | --                                        | --                                 | --                                  |

<sup>a</sup> At t<sub>3</sub>, in the 100 mCi group, data was available for 10 patients only, while at t<sub>24</sub>, in the 70 mCi group, only 11 patients were considered as the remaining 4 were submitted to further treatment.

\*  $p < 0.05$ , compared to t<sub>0</sub>; \*\*  $p < 0.01$ , compared to t<sub>0</sub>; \*\*\*  $p < 0.001$ , compared to t<sub>0</sub>;  $p$ -value for MN frequency comparison between different time points determined by the paired sample t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Wilcoxon signed-rank test (remaining cases); ‡  $p < 0.05$ , compared to 70 mCi; ‡ ‡  $p < 0.001$ , compared to 70 mCi;  $p$ -value for MN frequency comparison between different dose groups determined by the independent sample t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Mann-Whitney U test for independent samples (remaining cases).

**Table S3** – Frequency of micronucleated cells (%BNMN, mean  $\pm$  SD) in the 70 mCi dose group at t<sub>0</sub>, t<sub>1</sub>, t<sub>6</sub> and t<sub>24</sub>, and corresponding variation, according to genotype.

| Genotype               | n  | %BNMN (mean ± SD) |                     |                |                 | Δ %BNMN (mean ± SD)  |                 |                  |
|------------------------|----|-------------------|---------------------|----------------|-----------------|----------------------|-----------------|------------------|
|                        |    | t <sub>0</sub>    | t <sub>1</sub>      | t <sub>6</sub> | t <sub>24</sub> | Δt <sub>1</sub>      | Δt <sub>6</sub> | Δt <sub>24</sub> |
| <i>MLH1</i> rs1799977  |    |                   |                     |                |                 |                      |                 |                  |
| Ile/Ile                | 7  | 4.14 ± 3.29       | <b>12.14 ± 3.58</b> | 10.86 ± 7.11   | 9.20 ± 1.30     | <b>8.00 ± 4.97</b>   | 6.71 ± 6.85     | 5.00 ± 3.39      |
| Ile/Val+Val/Val        | 8  | 6.25 ± 3.85       | <b>5.88 ± 3.36*</b> | 7.25 ± 4.46    | 10.00 ± 3.74    | <b>-0.38 ± 3.70*</b> | 1.00 ± 4.90     | 3.50 ± 4.37      |
| <i>MSH3</i> rs26279    |    |                   |                     |                |                 |                      |                 |                  |
| Thr/Thr                | 10 | 5.50 ± 3.63       | 8.90 ± 3.81         | 9.90 ± 7.09    | 10.13 ± 1.64    | 3.40 ± 3.47          | 4.40 ± 7.46     | 4.63 ± 3.96      |
| Thr/Ala+Ala/Ala        | 5  | 4.80 ± 4.03       | 8.60 ± 6.54         | 7.00 ± 1.58    | 8.33 ± 5.13     | 3.80 ± 9.96          | 2.20 ± 3.70     | 3.00 ± 4.00      |
| <i>MSH4</i> rs5745325  |    |                   |                     |                |                 |                      |                 |                  |
| Ala/Ala                | 11 | 5.18 ± 3.79       | 8.91 ± 5.07         | 9.09 ± 6.64    | 9.63 ± 3.34     | 3.73 ± 6.83          | 3.91 ± 7.05     | 4.13 ± 3.91      |
| Ala/Thr+Thr/Thr        | 4  | 5.50 ± 3.70       | 8.50 ± 3.87         | 8.50 ± 4.04    | 9.67 ± 0.58     | 3.00 ± 3.56          | 3.00 ± 4.90     | 4.33 ± 4.51      |
| <i>PMS1</i> rs5742933  |    |                   |                     |                |                 |                      |                 |                  |
| G/G                    | 10 | 6.00 ± 4.08       | 9.20 ± 4.89         | 8.20 ± 3.77    | 9.88 ± 3.31     | 3.20 ± 7.05          | 2.20 ± 4.92     | 3.50 ± 4.14      |
| G/C+C/C                | 4  | 4.75 ± 0.50       | 9.00 ± 4.55         | 12.00 ± 9.93   | 9.00 ± 0.00     | 4.25 ± 4.27          | 7.25 ± 9.67     | 4.50 ± 0.71      |
| <i>MSH6</i> rs1042821  |    |                   |                     |                |                 |                      |                 |                  |
| Gly/Gly                | 10 | 4.20 ± 3.55       | 8.40 ± 4.74         | 6.80 ± 2.57    | 8.43 ± 2.23     | 4.20 ± 6.16          | 2.60 ± 4.14     | 4.43 ± 4.47      |
| Gly/Glu+Glu/Glu        | 5  | 7.40 ± 3.05       | 9.60 ± 4.88         | 13.20 ± 8.59   | 11.75 ± 2.63    | 2.20 ± 6.14          | 5.80 ± 9.78     | 3.75 ± 2.99      |
| <i>RAD51</i> rs1801321 |    |                   |                     |                |                 |                      |                 |                  |
| T/T                    | 4  | 6.50 ± 3.70       | 10.25 ± 4.11        | 12.25 ± 9.74   | 9.33 ± 0.58     | 3.75 ± 4.86          | 5.75 ± 11.30    | 2.33 ± 3.79      |
| T/G+G/G                | 11 | 4.82 ± 3.68       | 8.27 ± 4.90         | 7.73 ± 3.82    | 9.75 ± 3.33     | 3.45 ± 6.59          | 2.91 ± 4.06     | 4.88 ± 3.87      |
| <i>NBN</i> rs1805794   |    |                   |                     |                |                 |                      |                 |                  |

|                                                                                                                                                                                                                                                                   |    |             |              |             |              |             |             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------|--------------|-------------|--------------|-------------|-------------|-------------|
| Glu/Glu                                                                                                                                                                                                                                                           | 7  | 5.43 ± 4.61 | 10.00 ± 4.51 | 8.14 ± 4.56 | 9.86 ± 2.12  | 4.57 ± 5.80 | 2.71 ± 4.89 | 4.43 ± 3.99 |
| Glu/Gln+Gln/Gln                                                                                                                                                                                                                                                   | 8  | 5.13 ± 2.85 | 7.75 ± 4.80  | 9.63 ± 7.15 | 9.25 ± 4.11  | 2.63 ± 6.44 | 4.50 ± 7.71 | 3.75 ± 4.11 |
| <b><i>XRCC3</i> rs861539</b>                                                                                                                                                                                                                                      |    |             |              |             |              |             |             |             |
| Thr/Thr                                                                                                                                                                                                                                                           | 5  | 4.40 ± 2.41 | 9.20 ± 3.83  | 9.00 ± 5.61 | 11.00 ± 2.65 | 4.80 ± 4.66 | 4.60 ± 5.13 | 6.67 ± 2.52 |
| Thr/Met+Met/Met                                                                                                                                                                                                                                                   | 10 | 5.70 ± 4.17 | 8.60 ± 5.19  | 8.90 ± 6.37 | 9.13 ± 2.85  | 2.90 ± 6.72 | 3.20 ± 7.15 | 3.25 ± 3.96 |
| <b><i>XRCC5</i> rs2440</b>                                                                                                                                                                                                                                        |    |             |              |             |              |             |             |             |
| T/T                                                                                                                                                                                                                                                               | 5  | 3.60 ± 1.67 | 8.40 ± 3.65  | 7.00 ± 3.16 | 9.33 ± 0.58  | 4.80 ± 4.15 | 3.40 ± 3.36 | 6.00 ± 2.65 |
| T/C+C/C                                                                                                                                                                                                                                                           | 10 | 6.10 ± 4.12 | 9.00 ± 5.25  | 9.90 ± 6.86 | 9.75 ± 3.33  | 2.90 ± 6.87 | 3.80 ± 7.64 | 3.50 ± 4.14 |
| * $p < 0.05$ ; $p$ -value for variant allele carriers <i>versus</i> common allele homozygotes determined by the Student t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Mann-Whitney U test (remaining cases). |    |             |              |             |              |             |             |             |

**Table S4** – Frequency of micronucleated cells (%BNMN, mean  $\pm$  SD) in the 100 mCi dose group at t<sub>0</sub>, t<sub>1</sub> and t<sub>3</sub>, and corresponding variation, according to genotype.

| Genotype                      | n | %BNMN (mean ± SD)    |                      |                      | Δ %BNMN (mean ± SD)  |                 |
|-------------------------------|---|----------------------|----------------------|----------------------|----------------------|-----------------|
|                               |   | t <sub>0</sub>       | t <sub>1</sub>       | t <sub>3</sub>       | Δt <sub>1</sub>      | Δt <sub>3</sub> |
| <b><i>MLH1</i> rs1799977</b>  |   |                      |                      |                      |                      |                 |
| Ile/Ile                       | 3 | <b>5.33 ± 1.16</b>   | <b>24.00 ± 3.46</b>  | 21.50 ± 7.78         | <b>18.67 ± 3.06</b>  | 16.50 ± 6.36    |
| Ile/Val+Val/Val               | 8 | <b>11.25 ± 4.62*</b> | <b>14.75 ± 2.77*</b> | 21.38 ± 5.71         | <b>3.50 ± 4.57*</b>  | 10.13 ± 5.28    |
| <b><i>MSH3</i> rs26279</b>    |   |                      |                      |                      |                      |                 |
| Thr/Thr                       | 8 | 8.00 ± 2.73          | 16.88 ± 5.79         | <b>19.00 ± 4.93</b>  | 8.88 ± 7.72          | 10.71 ± 5.41    |
| Thr/Ala+Ala/Ala               | 3 | 14.00 ± 7.00         | 18.33 ± 3.51         | <b>27.00 ± 2.00*</b> | 4.33 ± 10.12         | 13.00 ± 7.55    |
| <b><i>MSH4</i> rs5745325</b>  |   |                      |                      |                      |                      |                 |
| Ala/Ala                       | 4 | 13.25 ± 5.68         | 13.75 ± 3.50         | 25.50 ± 4.73         | <b>0.50 ± 3.11</b>   | 12.25 ± 5.32    |
| Ala/Thr+Thr/Thr               | 7 | 7.57 ± 2.88          | 19.29 ± 4.99         | 18.67 ± 4.68         | <b>11.71 ± 7.27*</b> | 10.83 ± 6.49    |
| <b><i>PMS1</i> rs5742933</b>  |   |                      |                      |                      |                      |                 |
| G/G                           | 9 | 9.56 ± 5.13          | 17.89 ± 5.53         | 22.25 ± 5.87         | 8.33 ± 8.79          | 12.25 ± 5.34    |
| G/C+C/C                       | 2 | 10.00 ± 4.24         | 14.50 ± 0.71         | 18.00 ± 4.24         | 4.50 ± 4.95          | 8.00 ± 8.49     |
| <b><i>MSH6</i> rs1042821</b>  |   |                      |                      |                      |                      |                 |
| Gly/Gly                       | 9 | 10.00 ± 5.17         | 16.89 ± 3.44         | 20.56 ± 5.29         | 6.89 ± 7.04          | 10.56 ± 5.43    |
| Gly/Glu+Glu/Glu               | 2 | 8.00 ± 2.83          | 19.00 ± 12.73        | 29.00 ± --           | 11.00 ± 15.56        | 19.00 ± --      |
| <b><i>RAD51</i> rs1801321</b> |   |                      |                      |                      |                      |                 |
| T/T                           | 4 | 8.50 ± 1.29          | 14.75 ± 3.40         | 20.75 ± 6.02         | 6.25 ± 4.35          | 12.25 ± 5.38    |
| T/G+G/G                       | 7 | 10.29 ± 5.99         | 18.71 ± 5.62         | 21.83 ± 5.95         | 8.43 ± 9.98          | 10.83 ± 6.46    |
| <b><i>NBN</i> rs1805794</b>   |   |                      |                      |                      |                      |                 |
| Glu/Glu                       | 8 | 9.00 ± 4.84          | <b>19.13 ± 4.64</b>  | 19.57 ± 4.89         | 10.13 ± 8.10         | 10.14 ± 6.20    |
| Glu/Gln+Gln/Gln               | 3 | 11.33 ± 5.13         | <b>12.33 ± 2.52*</b> | 25.67 ± 5.77         | 1.00 ± 3.61          | 14.33 ± 4.04    |
| <b><i>XRCC3</i> rs861539</b>  |   |                      |                      |                      |                      |                 |
| Thr/Thr                       | 5 | 12.60 ± 5.60         | 17.40 ± 3.13         | 22.20 ± 6.72         | 4.80 ± 7.86          | 9.60 ± 7.30     |
| Thr/Met+Met/Met               | 6 | 7.17 ± 2.14          | 17.17 ± 6.71         | 20.60 ± 5.03         | 10.00 ± 8.32         | 13.20 ± 3.70    |
| <b><i>XRCC5</i> rs2440</b>    |   |                      |                      |                      |                      |                 |
| T/T                           | 2 | 7.50 ± 2.12          | 19.00 ± 4.24         | 22.50 ± 6.36         | 11.50 ± 6.36         | 15.00 ± 8.49    |
| T/C+C/C                       | 7 | 9.14 ± 4.53          | 16.57 ± 6.27         | 21.50 ± 6.19         | 7.43 ± 9.27          | 11.83 ± 5.53    |

\*  $p < 0.05$ ;  $p$ -value for variant allele carriers *versus* common allele homozygotes determined by the Student t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Mann-Whitney U test (remaining cases).

**Table S5** – Frequency of micronucleated cells (%BNMN, mean  $\pm$  SD) in the combined dose groups at  $t_0$  and  $t_1$ , and corresponding variation, according to genotype.

| Genotype                                                                                                                                                                                                                                                                   | n  | %BNMN (mean ± SD)   |                      | Δ %BNMN (mean ± SD) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------|----------------------|---------------------|
|                                                                                                                                                                                                                                                                            |    | t <sub>0</sub>      | t <sub>1</sub>       | Δt <sub>1</sub>     |
| <b><i>MLH1</i> rs1799977</b>                                                                                                                                                                                                                                               |    |                     |                      |                     |
| Ile/Ile                                                                                                                                                                                                                                                                    | 10 | <b>4.50 ± 2.80</b>  | <b>15.70 ± 6.63</b>  | <b>11.20 ± 6.71</b> |
| Ile/Val+Val/Val                                                                                                                                                                                                                                                            | 16 | <b>8.75 ± 4.85*</b> | <b>10.31 ± 5.46*</b> | <b>1.56 ± 4.49*</b> |
| <b><i>MSH3</i> rs26279</b>                                                                                                                                                                                                                                                 |    |                     |                      |                     |
| Thr/Thr                                                                                                                                                                                                                                                                    | 18 | 6.61 ± 3.42         | 12.44 ± 6.18         | 5.83 ± 6.22         |
| Thr/Ala+Ala/Ala                                                                                                                                                                                                                                                            | 8  | 8.25 ± 6.78         | 12.25 ± 7.31         | 4.00 ± 9.27         |
| <b><i>MSH4</i> rs5745325</b>                                                                                                                                                                                                                                               |    |                     |                      |                     |
| Ala/Ala                                                                                                                                                                                                                                                                    | 15 | 7.33 ± 5.55         | <b>10.20 ± 5.09</b>  | <b>2.87 ± 6.13</b>  |
| Ala/Thr+Thr/Thr                                                                                                                                                                                                                                                            | 11 | 6.82 ± 3.19         | <b>15.36 ± 7.00*</b> | <b>8.55 ± 7.41*</b> |
| <b><i>PMS1</i> rs5742933</b>                                                                                                                                                                                                                                               |    |                     |                      |                     |
| G/G                                                                                                                                                                                                                                                                        | 19 | 7.68 ± 4.83         | 13.32 ± 6.74         | 5.63 ± 8.13         |
| G/C+C/C                                                                                                                                                                                                                                                                    | 6  | 6.50 ± 3.33         | 10.83 ± 4.54         | 4.33 ± 3.98         |
| <b><i>MSH6</i> rs1042821</b>                                                                                                                                                                                                                                               |    |                     |                      |                     |
| Gly/Gly                                                                                                                                                                                                                                                                    | 19 | 6.95 ± 5.20         | 12.42 ± 5.96         | 5.47 ± 6.55         |
| Gly/Glu+Glu/Glu                                                                                                                                                                                                                                                            | 7  | 7.57 ± 2.76         | 12.29 ± 7.99         | 4.71 ± 9.16         |
| <b><i>RAD51</i> rs1801321</b>                                                                                                                                                                                                                                              |    |                     |                      |                     |
| T/T                                                                                                                                                                                                                                                                        | 8  | 7.50 ± 2.78         | 12.50 ± 4.24         | 5.00 ± 4.47         |
| T/G+G/G                                                                                                                                                                                                                                                                    | 18 | 6.94 ± 5.31         | 12.33 ± 7.26         | 5.39 ± 8.18         |
| <b><i>NBN</i> rs1805794</b>                                                                                                                                                                                                                                                |    |                     |                      |                     |
| Glu/Glu                                                                                                                                                                                                                                                                    | 15 | 7.33 ± 4.92         | <b>14.87 ± 6.46</b>  | 7.53 ± 7.44         |
| Glu/Gln+Gln/Gln                                                                                                                                                                                                                                                            | 11 | 6.82 ± 4.40         | <b>9.00 ± 4.69*</b>  | 2.18 ± 5.67         |
| <b><i>XRCC3</i> rs861539</b>                                                                                                                                                                                                                                               |    |                     |                      |                     |
| Thr/Thr                                                                                                                                                                                                                                                                    | 10 | 8.50 ± 5.93         | 13.30 ± 5.44         | 4.80 ± 6.09         |
| Thr/Met+Met/Met                                                                                                                                                                                                                                                            | 16 | 6.25 ± 3.53         | 11.81 ± 7.04         | 5.56 ± 7.92         |
| <b><i>XRCC5</i> rs2440</b>                                                                                                                                                                                                                                                 |    |                     |                      |                     |
| T/T                                                                                                                                                                                                                                                                        | 7  | 4.71 ± 2.50         | 11.43 ± 6.21         | 6.71 ± 5.38         |
| T/C+C/C                                                                                                                                                                                                                                                                    | 17 | 7.35 ± 4.43         | 12.12 ± 6.71         | 4.76 ± 8.00         |
| * <i>p</i> < 0.05; <i>p</i> -value for variant allele carriers <i>versus</i> common allele homozygotes determined by the Student t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Mann-Whitney U test (remaining cases). |    |                     |                      |                     |

**Table S6** – Cytokinesis-Block Proliferation Index (CBPI, mean  $\pm$  SD) in the 70 mCi dose group at t<sub>0</sub>, t<sub>1</sub>, t<sub>6</sub> and t<sub>24</sub>, and corresponding variation, according to genotype.

| Genotype               | n  | CBPI (mean ± SD) |                |                |                 | ΔCBPI (mean ± SD) |                 |                  |
|------------------------|----|------------------|----------------|----------------|-----------------|-------------------|-----------------|------------------|
|                        |    | t <sub>0</sub>   | t <sub>1</sub> | t <sub>6</sub> | t <sub>24</sub> | Δt <sub>1</sub>   | Δt <sub>6</sub> | Δt <sub>24</sub> |
| <i>MLH1</i> rs1799977  |    |                  |                |                |                 |                   |                 |                  |
| Ile/Ile                | 7  | 1.73 ± 0.13      | 1.79 ± 0.20    | 1.69 ± 0.10    | 1.51 ± 0.12     | 0.06 ± 0.10       | -0.04 ± 0.14    | -0.23 ± 0.19     |
| Ile/Val+Val/Val        | 8  | 1.82 ± 0.12      | 1.86 ± 0.13    | 1.78 ± 0.11    | 1.56 ± 0.07     | 0.05 ± 0.15       | -0.03 ± 0.17    | -0.25 ± 0.16     |
| <i>MSH3</i> rs26279    |    |                  |                |                |                 |                   |                 |                  |
| Thr/Thr                | 10 | 1.76 ± 0.15      | 1.78 ± 0.16    | 1.74 ± 0.12    | 1.51 ± 0.10     | 0.01 ± 0.11       | -0.02 ± 0.16    | -0.25 ± 0.19     |
| Thr/Ala+Ala/Ala        | 5  | 1.80 ± 0.07      | 1.94 ± 0.12    | 1.74 ±0.11     | 1.59 ± 0.02     | 0.14 ± 0.11       | -0.06 ± 0.15    | -0.24 ± 0.10     |
| <i>MSH4</i> rs5745325  |    |                  |                |                |                 |                   |                 |                  |
| Ala/Ala                | 11 | 1.77 ± 0.14      | 1.81 ± 0.17    | 1.75 ± 0.11    | 1.56 ± 0.06     | 0.04 ± 0.13       | -0.02 ± 0.16    | -0.23 ± 0.17     |
| Ala/Thr+Thr/Thr        | 4  | 1.79 ±0.11       | 1.89 ± 0.14    | 1.72 ± 0.11    | 1.48 ± 0.15     | 0.10 ± 0.08       | -0.08 ± 0.13    | -0.28 ± 0.18     |
| <i>PMS1</i> rs5742933  |    |                  |                |                |                 |                   |                 |                  |
| G/G                    | 10 | 1.76 ± 0.14      | 1.83 ± 0.17    | 1.76 ± 0.11    | 1.51 ± 0.09     | 0.06 ± 0.11       | -0.01 ± 0.17    | -0.24 ± 0.16     |
| G/C+C/C                | 4  | 1.76 ± 0.07      | 1.83 ± 0.20    | 1.69 ± 0.12    | 1.65 ± 0.00     | 0.07 ± 0.17       | -0.07 ± 0.05    | -0.14 ± 0.06     |
| <i>MSH6</i> rs1042821  |    |                  |                |                |                 |                   |                 |                  |
| Gly/Gly                | 10 | 1.79 ± 0.14      | 1.87 ± 0.17    | 1.73 ± 0.10    | 1.53 ± 0.08     | 0.09 ± 0.11       | -0.06 ± 0.18    | -0.25 ± 0.20     |
| Gly/Glu+Glu/Glu        | 5  | 1.75 ± 0.11      | 1.75 ± 0.14    | 1.76 ± 0.13    | 1.54 ± 0.13     | -0.01 ± 0.14      | 0.00 ± 0.06     | -0.24 ± 0.11     |
| <i>RAD51</i> rs1801321 |    |                  |                |                |                 |                   |                 |                  |
| T/T                    | 4  | 1.70 ± 0.11      | 1.74 ± 0.16    | 1.72 ± 0.14    | 1.60 ± 0.09     | 0.04 ± 0.13       | 0.02 ± 0.17     | -0.12 ± 0.05     |
| T/G+G/G                | 11 | 1.80 ± 0.13      | 1.86 ± 0.16    | 1.75 ± 0.11    | 1.51 ± 0.09     | 0.06 ± 0.13       | -0.06 ± 0.15    | -0.29 ± 0.17     |
| <i>NBN</i> rs1805794   |    |                  |                |                |                 |                   |                 |                  |

|                                                                                                                                                                                                                                                         |    |             |             |             |             |             |              |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|
| Glu/Glu                                                                                                                                                                                                                                                 | 7  | 1.76 ± 0.18 | 1.77 ± 0.17 | 1.78 ± 0.09 | 1.52 ± 0.09 | 0.00 ± 0.11 | 0.02 ± 0.16  | -0.25 ± 0.18 |
| Glu/Gln+Gln/Gln                                                                                                                                                                                                                                         | 8  | 1.79 ± 0.08 | 1.88 ± 0.15 | 1.71 ± 0.12 | 1.57 ± 0.10 | 0.10 ± 0.12 | -0.08 ± 0.13 | -0.24 ± 0.16 |
| <b><i>XRCC3</i> rs861539</b>                                                                                                                                                                                                                            |    |             |             |             |             |             |              |              |
| Thr/Thr                                                                                                                                                                                                                                                 | 5  | 1.83 ± 0.08 | 1.89 ± 0.11 | 1.78 ± 0.13 | 1.53 ± 0.12 | 0.06 ± 0.13 | -0.04 ± 0.14 | -0.31 ± 0.19 |
| Thr/Met+Met/Met                                                                                                                                                                                                                                         | 10 | 1.75 ± 0.15 | 1.80 ± 0.19 | 1.72 ± 0.10 | 1.54 ± 0.09 | 0.05 ± 0.13 | -0.03 ± 0.16 | -0.22 ± 0.16 |
| <b><i>XRCC5</i> rs2440</b>                                                                                                                                                                                                                              |    |             |             |             |             |             |              |              |
| T/T                                                                                                                                                                                                                                                     | 5  | 1.80 ± 0.06 | 1.89 ± 0.10 | 1.74 ± 0.10 | 1.57 ± 0.13 | 0.10 ± 0.12 | -0.06 ± 0.14 | -0.25 ± 0.19 |
| T/C+C/C                                                                                                                                                                                                                                                 | 10 | 1.77 ± 0.16 | 1.80 ± 0.19 | 1.74 ± 0.12 | 1.52 ± 0.08 | 0.03 ± 0.13 | -0.03 ± 0.16 | -0.24 ± 0.17 |
| <i>p</i> -value for variant allele carriers <i>versus</i> common allele homozygotes determined by the Student t test (whenever a normal distribution could not be excluded through the Shapiro-Wilk test) or the Mann-Whitney U test (remaining cases). |    |             |             |             |             |             |              |              |