# Supplementary Information for 

# Mitochondrial Polymorphisms, in The D-Loop Area, Are Associated with Brain Tumors 

Donya Altafi, M.Sc. ${ }^{1 *}$, Soha Sadeghi. M.Sc. ${ }^{1}$, Hamed Hojatian, M.Sc. ${ }^{1}$, Maryam Torabi Afra, M.Sc. ${ }^{1}$, Safoura Pakizeh Kar, M.Sc. ${ }^{2}$, Mojtaba Gorji, Ph.D. ${ }^{3}$, Massoud Houshmand, Ph.D. ${ }^{4,5 *}$

1. Molecular Biology Department, NourDanesh Institute of Higher Education, Esfahan, Iran
2. Department of Biology, International University of Guilan, Guilan, Iran
3. Department of Hematology and Oncology, Lorestan Medical University, Lorestan, Iran
4. Department of Medical Genetics, National Institutes for Genetic Engineering and Biotechnology, Tehran, Iran
5. Research Center, Knowledge University, Erbil, Kurdistan Region, Iraq
*Corresponding Addresses: P.O.Box: 1483614681, Molecular Biology Department, NourDanesh Institute of Higher Education, Esfahan, Iran
P.O.Box: 14965/161, Department of Medical Genetics, National Institutes for Genetic Engineering and Biotechnology, Tehran, Iran

Emails: donya.altafi@gmail.com,massoudh@nigeb.ac.ir

Table S1: D-loop region variant distributions in controls and cases

| Ethnicity | Number | A152G | T195C | T204C | G207A | A263G | T489C | A750G |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Arab |  | 21.70\% | 17.30\% | 4.30\% | 8.70\% | 100\% | 17.30\% | 95.60\% |
|  | 23 | 5 | 4 | 1 | 2 | 23 | 4 | 22 |
| Armenian |  | 22.20\% | 11.10\% | 11.10\% | 11.10\% | 100\% | 11.10\% | 94.40\% |
|  | 18 | 4 | 2 | 2 | 2 | 18 | 2 | 17 |
| Asurian |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Azari |  | 63.60\% | 22.70\% | 13.60\% | 9.10\% | 100\% | 13.60\% | 95.40\% |
|  | 24 | 14 | 5 | 3 | 2 | 22 | 3 | 21 |
| Baluch |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bandari |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Esfahan |  | 12.50\% | 18.75\% | 18.75\% | 0\% | 100\% | 12.50\% | 87.50\% |
|  | 15 | 2 | 3 | 3 | 0 | 16 | 2 | 14 |
| Kerman |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mashhad |  | 39.10\% | 30.40\% | 8.70\% | 13\% | 100\% | 30.40\% | 100\% |
|  | 24 | 9 | 7 | 2 | 3 | 23 | 7 | 23 |
| Shiraz |  | 30.40\% | 13\% | 17.40\% | 13\% | 100\% | 21.70\% | 95.60\% |
|  | 22 | 7 | 3 | 4 | 3 | 23 | 5 | 22 |
| Yazd |  | 29.10\% | 37.50\% | 8.30\% | 4.10\% | 100\% | 12.50\% | 83.30\% |
|  | 24 | 7 | 9 | 2 | 1 | 24 | 3 | 20 |
| Gilani |  | 29.10\% | 37.50\% | 8.30\% | 4.10\% | 100\% | 16.60\% | 91.60\% |
|  | 24 | 7 | 9 | 2 | 1 | 24 | 4 | 22 |
| Jews |  | 35.10\% | 10.80\% | 0\% | 2.70\% | 100\% | 18.90\% | 100\% |
|  | 38 | 13 | 4 | 0 | 1 | 37 | 7 | 37 |
| Kurd |  | 29.10\% | 20.80\% | 8.30\% | 4.10\% | 100\% | 20.80\% | 87.50\% |
|  | 25 | 7 | 5 | 2 | 1 | 24 | 5 | 21 |
| Lur |  | 18.10\% | 18.10\% | 13.60\% | 9.10\% | 100\% | 31.80\% | 90.90\% |
|  | 23 | 4 | 4 | 3 | 2 | 22 | 7 | 20 |
| Mazani |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mixed Tehran |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total(Controls) |  | 30.80\% | 21.40\% | 9.30\% | 7\% | 100\% | 19.10\% | 93.30\% |
|  | 454 | 79 | 55 | 24 | 18 | 256 | 49 | 239 |
| patients |  | 32\% | 12\% | 12\% | 12\% | 100\% | 24\% | 84\% |
|  | 25 | 8 | 3 | 3 | 3 | 25 | 6 | 21 |

Table S1: Continued

| Ethnicity | Number | T15936C | C15884G | G15928A | C16069T | T16126C | G16145A | C16148T |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Arab |  | 0\% | 0\% | 0\% | 13.04\% | 34.78\% | 17.39\% | 8.69\% |
|  | 23 | 0 | 0 | 0 | 3 | 8 | 4 | 2 |
| Armenian |  | 0\% | 0\% | 0\% | 16.66\% | 16.66\% | 22.22\% | 0\% |
|  | 18 | 0 | 0 | 0 | 3 | 3 | 4 | 0 |
| Asurian |  | 0\% | 0\% | 0\% | 25\% | 31.25\% | 6.25\% | 0\% |
|  | 16 | 0 | 0 | 0 | 4 | 5 | 1 | 0 |
| Azari |  | 0\% | 0\% | 12.50\% | 12.50\% | 25\% | 0\% | 4.16\% |
|  | 24 | 0 | 0 | 3 | 3 | 6 | 0 | 1 |
| Baluch |  | 0\% | 0\% | 0\% | 16.66\% | 16.66\% | 8.33\% | 0\% |
|  | 12 | 0 | 0 | 0 | 2 | 2 | 1 | 0 |
| Bandari |  | 0\% | 0\% | 0\% | 13.33\% | 23.33\% | 10\% | 3.33\% |
|  | 30 | 0 | 0 | 0 | 4 | 7 | 3 | 1 |
| Esfahan |  | 0\% | 0\% | 6.66\% | 6.66\% | 20\% | 13.33\% | 0\% |
|  | 15 | 0 | 0 | 1 | 1 | 3 | 2 | 0 |
| Kerman |  | 0\% | 0\% | 8\% | 0\% | 16\% | 4\% | 0\% |
|  | 25 | 0 | 0 | 2 | 0 | 4 | 1 | 0 |
| Mashhad |  | 0\% | 0\% | 16.66\% | 16.66\% | 54.16\% | 12.50\% | 4.16\% |
|  | 24 | 0 | 0 | 4 | 4 | 13 | 3 | 1 |
| Shiraz |  | 0\% | 0\% | 18.18\% | 9.09\% | 40.90\% | 13.63\% | 0\% |
|  | 22 | 0 | 0 | 4 | 2 | 9 | 3 | 0 |
| Yazd |  | 0\% | 0\% | 0\% | 12.50\% | 33.33\% | 16.66\% | 12.50\% |
|  | 24 | 0 | 0 | 0 | 3 | 8 | 4 | 3 |
| Gilani |  | 0\% | 0\% | 0\% | 16.66\% | 25\% | 16.66\% | 8.33\% |
|  | 24 | 0 | 0 | 0 | 4 | 6 | 4 | 2 |
| Jews |  | 0\% | 0\% | 0\% | 13.15\% | 21.05\% | 10.52\% | 7.89\% |
|  | 38 | 0 | 0 | 0 | 5 | 8 | 4 | 3 |
| Kurd |  | 0\% | 0\% | 12\% | 32\% | 40\% | 20\% | 8\% |
|  | 25 | 0 | 0 | 3 | 8 | 10 | 5 | 2 |
| Lur |  | 0\% | 0\% | 0\% | 21.73\% | 34.78\% | 26.08\% | 0\% |
|  | 23 | 0 | 0 | 0 | 5 | 8 | 6 | 0 |
| Mazani |  | 0\% | 0\% | 21.73\% | 17.39\% | 43.47\% | 17.39\% | 0\% |
|  | 23 | 0 | 0 | 5 | 4 | 10 | 4 | 0 |
| Mixed Tehran |  | 0\% | 0\% | 7.95\% | 9.09\% | 34.09\% | 11.36\% | 3.40\% |
|  | 88 | 0 | 0 | 7 | 8 | 30 | 10 | 3 |
| Total(Controls) |  | 0\% | 0\% | 6.38\% | 13.87\% | 30.83\% | 12.99\% | 3.96\% |
|  | 454 | 0 | 0 | 29 | 63 | 140 | 59 | 18 |
| patients |  | 8\% | 8\% | 8\% | 24\% | 52\% | 20\% | 8\% |
|  | 25 | 2 | 2 | 2 | 6 | 13 | 5 | 2 |

Table S1: Continued

| Ethnicity | Number | T16172C | C16186T | T16189C | C16193T | C16223T | T16224C | C16234T |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Arab |  | 4.34\% | 0\% | 30.43\% | 0\% | 30.43\% | 0\% | 0\% |
|  | 23 | 1 | 0 | 7 | 0 | 7 | 0 | 0 |
| Armenian |  | 11.11\% | 0\% | 22.22\% | 5.55\% | 27.77\% | 0\% | 0\% |
|  | 18 | 2 | 0 | 4 | 1 | 5 | 0 | 0 |
| Asurian |  | 0\% | 0\% | 31.25\% | 0\% | 6.25\% | 0\% | 0\% |
|  | 16 | 0 | 0 | 5 | 0 | 1 | 0 | 0 |
| Azari |  | 0\% | 4.16\% | 16.66\% | 4.16\% | 25\% | 0\% | 0\% |
|  | 24 | 0 | 1 | 4 | 1 | 6 | 0 | 0 |
| Baluch |  | 0\% | 8.33\% | 16.66\% | 0\% | 8.33\% | 0\% | 0\% |
|  | 12 | 0 | 1 | 2 | 0 | 1 | 0 | 0 |
| Bandari |  | 3.33\% | 10\% | 40\% | 0\% | 43.33\% | 0\% | 0\% |
|  | 30 | 1 | 3 | 12 | 0 | 13 | 0 | 0 |
| Esfahan |  | 0\% | 0\% | 46.66\% | 0\% | 46.66\% | 0\% | 0\% |
|  | 15 | 0 | 0 | 7 | 0 | 7 | 0 | 0 |
| Kerman |  | 4\% | 0\% | 32\% | 4\% | 36\% | 0\% | 4\% |
|  | 25 | 1 | 0 | 8 | 1 | 9 | 0 | 1 |
| Mashhad |  | 12.50\% | 8.33\% | 25\% | 0\% | 37.50\% | 0\% | 0\% |
|  | 24 | 3 | 2 | 6 | 0 | 9 | 0 | 0 |
| Shiraz |  | 4.54\% | 4.54\% | 22.72\% | 4.54\% | 45.45\% | 0\% | 0\% |
|  | 22 | 1 | 1 | 5 | 1 | 10 | 0 | 0 |
| Yazd |  | 8.33\% | 8.33\% | 25\% | 4.16\% | 33.33\% | 0\% | 4.16\% |
|  | 24 | 2 | 2 | 6 | 1 | 8 | 0 | 1 |
| Guilani |  | 4.16\% | 0\% | 8.33\% | 0\% | 37.50\% | 0\% | 8.33\% |
|  | 24 | 1 | 0 | 2 | 0 | 9 | 0 | 2 |
| Jews |  | 0\% | 0\% | 15.78\% | 0\% | 23.68\% | 0\% | 0\% |
|  | 38 | 0 | 0 | 6 | 0 | 9 | 0 | 0 |
| Kurd |  | 4\% | 4\% | 24\% | 0\% | 28\% | 4\% | 0\% |
|  | 25 | 1 | 1 | 6 | 0 | 7 | 1 | 0 |
| Lur |  | 0\% | 0\% | 4.34\% | 0\% | 26.08\% | 0\% | 0\% |
|  | 23 | 0 | 0 | 1 | 0 | 6 | 0 | 0 |
| Mazani |  | 8.69\% | 0\% | 17.39\% | 0\% | 34.78\% | 0\% | 0\% |
|  | 23 | 2 | 0 | $4$ | 0 | $8$ | 0 | 0 |
| Mixed Tehran |  | 4.54\% | 5.68\% | 21.59\% | 1.13\% | 32.95\% | 0\% | 0\% |
|  | 88 | 4 | 5 | 19 | 1 | 29 | 0 | 0 |
| (Total(Controls |  | 4.18\% | 3.52\% | 22.90\% | 1.32\% | 31.71\% | 0.22\% | 0.88\% |
|  | 454 | 19 | 16 | 104 | 6 | 144 | 1 | 4 |
| Patients |  | 8\% | 12\% | 12\% | 8\% | 12\% | 8\% | 8\% |
|  | 25 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |

Table S1: Continued

| Ethnicity | Number | C16256T | C16261T | C16270T | G16274A | C16292T | T16311C | A16318C |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Arab |  | 4.34\% | 13.04\% | 0\% | 8.69\% | 0\% | 13.04\% | 8.69\% |
|  | 23 | 1 | 3 | 0 | 2 | 0 | 3 | 2 |
| Armenian |  | 11.11\% | 11.11\% | 5.55\% | 11.11\% | 0\% | 16.66\% | 0\% |
|  | 18 | 2 | 2 | 1 | 2 | 0 | 3 | 0 |
| Asurian |  | 0\% | 6.25\% | 0\% | 0\% | 0\% | 0\% | 0\% |
|  | 16 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Azari |  | 0\% | 0\% | 0\% | 0\% | 4.16\% | 20.83\% | 0\% |
|  | 24 | 0 | 0 | 0 | 0 | 1 | 5 | 0 |
| Baluch |  | 0\% | 8.33\% | 0\% | 8.33\% | 0\% | 0\% | 0\% |
|  | 12 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Bandari |  | 3.33\% | 10\% | 0\% | 0\% | 6.66\% | 16.66\% | 0\% |
|  | 30 | 1 | 3 | 0 | 0 | 2 | 5 | 0 |
| Esfahan |  | 0\% | 26.66\% | 13.33\% | 0\% | 0\% | 33.33\% | 0\% |
|  | 15 | 0 | 4 | 2 | 0 | 0 | 5 | 0 |
| Kerman |  | 4\% | 4\% | 4\% | 4\% | 0\% | 4\% | 4\% |
|  | 25 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| Mashhad |  | 0\% | 8.33\% | 0\% | 0\% | 8.33\% | 12.50\% | 8.33\% |
|  | 24 | 0 | 2 | 0 | 0 | 2 | 3 | 2 |
| Shiraz |  | 13.63\% | 9.09\% | 4.54\% | 13.63\% | 4.54\% | 9.09\% | 4.54\% |
|  | 22 | 3 | 2 | 1 | 3 | 1 | 2 | 1 |
| Yazd |  | 0\% | 8.33\% | 0\% | 0\% | 4.16\% | 12.50\% | 4.16\% |
|  | 24 | 0 | 2 | 0 | 0 | 1 | 3 | 1 |
| Guilani |  | 4.16\% | 12.50\% | 4.16\% | 4.16\% | 4.16\% | 8.33\% | 4.16\% |
|  | 24 | 1 | 3 | 1 | 1 | 1 | 2 | 1 |
| Jews |  | 5.26\% | 10.52\% | 2.63\% | 0\% | 2.63\% | 15.78\% | 10.52\% |
|  | 38 | 2 | 4 | 1 | 0 | 1 | 6 | 4 |
| Kurd |  | 4\% | 20\% | 4\% | 0\% | 8\% | 24\% | 4\% |
|  | 25 | 1 | 5 | 1 | 0 | 2 | 6 | 1 |
| Lur |  | 17.39\% | 21.73\% | 4.34\% | 0\% | 0\% | 39.13\% | 8.69\% |
|  | 23 | 4 | 5 | 1 | 0 | 0 | 9 | 2 |
| Mazani |  | 0\% | 17.39\% | 0\% | 0\% | 4.34\% | 8.69\% | 4.34\% |
|  | 23 | 0 | 4 | 0 | 0 | 1 | 2 | 1 |
| Mixed Tehran |  | 4.54\% | 6.81\% | 3.40\% | 3.40\% | 0\% | 13.63\% | 5.68\% |
|  | 88 | 4 | 6 | 3 | 3 | 0 | 12 | 5 |
| (Total(Controls |  | 4.40\% | 10.57\% | 2.60\% | 2.86\% | 2.64\% | 14.75\% | 4.62\% |
|  | 454 | 20 | 48 | 12 | 13 | 12 | 67 | 21 |
| patients |  | 8\% | 20\% | 8\% | 12\% | 8\% | 8\% | 8\% |
|  | 25 | 2 | 5 | 2 | 3 | 2 | 2 | 2 |

Table S1: Continued

| Ethnicity | Number | C16327T | C16355T | T16362C | G16384A | C16392T | C16394T | G16477A | T16519C |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Arab |  | 0\% | 8.69\% | 17.39\% | 0\% | 0\% | 0\% | 0\% | 65.21\% |
|  | 23 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 15 |
| Armenian |  | 0\% | 11.11\% | 0\% | 0\% | 0\% | 0\% | 0\% | 55.55\% |
|  | 18 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1000\% |
| Asurian |  | 0\% | 0\% | 6.25\% | 0\% | 0\% | 0\% | 0\% | 62.50\% |
|  | 16 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| Azari |  | 0\% | 4.16\% | 8.33\% | 0\% | 0\% | 0\% | 0\% | 79.16\% |
|  | 24 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 19 |
| Baluch |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 75\% |
|  | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Bandari |  | 0\% | 0\% | 6.66\% | 0\% | 0\% | 0\% | 0\% | 53.33\% |
|  | 30 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 16 |
| Esfahan |  | 0\% | 0\% | 20\% | 0\% | 0\% | 0\% | 0\% | 46.66\% |
|  | 15 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 7 |
| Kerman |  | 0\% | 0\% | 12\% | 0\% | 0\% | 4\% | 0\% | 0\% |
|  | 25 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 |
| Mashhad |  | 0\% | 0\% | 4.16\% | 0\% | 0\% | 0\% | 0\% | 75\% |
|  | 24 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 18 |
| Shiraz |  | 0\% | 0\% | 22.72\% | 0\% | 4.54\% | 9.09\% | 0\% | 68.18\% |
|  | 22 | 0 | 0 | 5 | 0 | 1 | 2 | 0 | 15 |
| Yazd |  | 0\% | 8.33\% | 4.16\% | 0\% | 0\% | 4.16\% | 0\% | 70.83\% |
|  | 24 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 17 |
| Guilani |  | 4.16\% | 0\% | 4.16\% | 0\% | 0\% | 0\% | 0\% | 66.66\% |
|  | 24 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 16 |
| Jews |  | 0\% | 2.63\% | 5.26\% | 0\% | 0\% | 0\% | 0\% | 71.05\% |
|  | 38 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 27 |
| Kurd |  | 4\% | 4\% | 8\% | 0\% | 0\% | 0\% | 0\% | 72\% |
|  | 25 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 18 |
| Lur |  | 4.34\% | 0\% | 8.69\% | 0\% | 0\% | 0\% | 0\% | 65.21\% |
|  | 23 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 15 |
| Mazani |  | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 0\% | 56.52\% |
|  | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Mixed Tehran |  | 0\% | 1.13\% | 14.77\% | 0\% | 0\% | 0\% | 0\% | 67.04\% |
|  | 88 | 0 | 1 | 13 | 0 | 0 | 0 | 0 | 59 |
| (Total(Controls |  | 0.66\% | 2.20\% | 9.25\% | 0\% | 0.22\% | 0\% | 0\% | 62.55\% |
|  | 454 | 3 | 10 | 42 | 0 | 1 | 4 | 0 | 284 |
| patients |  | 8\% | 12\% | 20\% | 8\% | 8\% | 8\% | 8\% | 56\% |
|  | 25 | 2 | 3 | 5 | 2 | 2 | 2 | 2 | 14 |

