

Supplementary Table 1. Clinical information of MMD patients and healthy volunteers

| | Gender | Age (years) | RNF213 variant | Symptom | Infarct | Suzuki grade, right/left | Used | Reference |
|----------------------|--------|-------------|----------------|------------------------|---------|--------------------------|--|----------------|
| MMD1 | F | 7 | GA | Headache | No | 3/2 | Microarray | ¹¹⁾ |
| MMD2 | F | 8 | Unidentified | TIA | No | 3/2 | Microarray | ¹¹⁾ |
| MMD3 | M | 8 | GA | TIA | No | 3/3 | Microarray | ¹¹⁾ |
| MMD4 | F | 19 | GA | Weakness | Yes | 2/1 | Microarray | ¹¹⁾ |
| MMD5 | F | 37 | GA | TIA | No | 3/2 | Microarray | ¹¹⁾ |
| MMD6 | F | 8 | Unidentified | Headache, seizure, TIA | No | 3/3 | Microarray | ¹¹⁾ |
| MMD7 | F | 36 | GA | Headache, TIA | No | 3/3 | Microarray | ¹¹⁾ |
| MMD8 | F | 4 | GA | Headache | No | 3/3 | qRT-PCR | ¹¹⁾ |
| MMD16 | M | 5 | GA | TIA | No | 3/2 | HCS, qRT-PCR, siRNA transfection (cell viability assay, qRT-PCR, Cell cycle, β -galactosidase assay, Tube formation), Western blot | |
| MMD17 | M | 9 | GA | TIA | No | 3/3 | HCS, β -galactosidase assay, Immunofluorescence, qRT-PCR, siRNA transfection (cell viability assay, qRT-PCR, Immunofluorescence) | |
| MMD18 | F | 6 | GA | TIA | No | 2/3 | HCS, cell cycle, siRNA transfection (cell viability assay, qRT-PCR, Cell cycle, Tube formation), Western blot | |
| MMD19 | M | 10 | GA | Headache | No | 3/3 | HCS, cell cycle, β -galactosidase assay, Tube formation, siRNA transfection (cell cycle, β -galactosidase assay) | |
| MMD20 | M | 13 | GA | Involuntary movement | No | 3/3 | HCS, cell cycle | |
| Healthy volunteers1 | M | 20 | GA | N/A | N/A | N/A | Microarray | ¹¹⁾ |
| Healthy volunteers2 | F | 21 | GG | N/A | N/A | N/A | Microarray, qRT-PCR | ¹¹⁾ |
| Healthy volunteers3 | F | 24 | GG | N/A | N/A | N/A | Microarray | ¹¹⁾ |
| Healthy volunteers4 | M | 23 | GG | N/A | N/A | N/A | Microarray | ¹¹⁾ |
| Healthy volunteers9 | M | 22 | GG | N/A | N/A | N/A | HCS, cell cycle | |
| Healthy volunteers10 | M | 23 | GG | N/A | N/A | N/A | HCS, cell cycle | |
| Healthy volunteers11 | F | 21 | GG | N/A | N/A | N/A | HCS, cell cycle, β -galactosidase assay, Immunofluorescence, Tube formation | |
| Healthy volunteers12 | F | 24 | GG | N/A | N/A | N/A | HCS, cell cycle, qRT-PCR | |
| Healthy volunteers13 | F | 25 | GG | N/A | N/A | N/A | HCS, cell cycle, qRT-PCR | |

MMD : Moyamoya disease, RNF213 : Ring finger protein 213, F : female, GA : heterozygotes, TIA : transient ischemic attack, M : male, qRT-PCR : real-time quantitative polymerase chain reaction, HCS : high content screening, N/A : not applicable, GG : wild types