**Supplementary Material**

**Figure S1** | Segregation analysis for three families.

(A) Segregation analysis for family 1 by whole exome sequencing and Sanger sequencing. (B) Segregation analysis for family 2 by whole exome sequencing and whole genome sequencing. (C) Segregation analysis for family 3 by whole genome sequencing and Sanger sequence.
**Table S1.** Individual 7 IFN-related gene expression in three families (relative mRNA expression).

| Members | IFI27 | IFI44 | IFI44L | IFIT1 | ISG15 | RSAD2 | SIGLEC1 | IFN-Score |
|---------|-------|-------|--------|-------|-------|-------|---------|-----------|
| **Family 1** | | | | | | | | |
| I-1 (Father) | 1.074 | -1.413 | -0.913 | -0.150 | -1.473 | 0.135 | -1.008 | -3,747 |
| I-2 (Mother) | 4.597 | -1.300 | -0.081 | 6.620 | -1.459 | 11.661 | -0.873 | 19,164 |
| II-1 (Patient 1) (6 months after JAK-I treatment) | 89,424 | 0.429 | 15.078 | 15.165 | -1.270 | 19,386 | -0.387 | 137,825 |
| II-1 (Patient 1) (7 months after JAK-I treatment) | 659,869 | 0.113 | 16.575 | 38.290 | 1.175 | 92,438 | 1.413 | 809,871 |
| **Family 2** | | | | | | | | |
| I-1 (Father) | -0.601 | -1.425 | -0.963 | -0.133 | -1.361 | -0.939 | -0.647 | -6,067 |
| II-2 (Brother) | 1.486 | -1.336 | 0.370 | 6.779 | -1.150 | 6.138 | -0.322 | 11,965 |
| II-6 (Patient 2) | 321,236 | 0.964 | 20.271 | 25.464 | -0.282 | 76,358 | 0.454 | 444,466 |
| **Family 3** | | | | | | | | |
| II-1 (Patient 4) | 4.197 | 23.617 | 137,556 | 644,621 | 98,365 | 1220,366 | 6,865 | 2135,588 |
| II-2 (Patient 3) | 11,696 | 57,670 | 267,005 | 559,203 | 44,426 | 2083,289 | 0.782 | 3024,071 |