

TABLE S1 Data from IRMS analysis showing  $\delta^{18}\text{O}$  values for non-fractionated DNA and RNA samples incubated with natural abundance  $^{18}\text{O}$ -water or with  $\text{H}_2^{18}\text{O}$ .

| Sample Identifier  | Nucleic acid type | Incubation time | Treatment                               | $\delta^{18}\text{O}$ (VSMOW) |
|--------------------|-------------------|-----------------|---|-------------------------------|
| 7-16O-a-DNA        | DNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 22.4                          |
| 8-16O-b-DNA        | DNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 22.6                          |
| 9-16O-c-DNA        | DNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 22.0                          |
| 31-16O-a-DNA       | DNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 22.6                          |
| 32-16O-b-DNA       | DNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 22.7                          |
| 33-16O-c-DNA       | DNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 23.1                          |
| 43-16O-a-DNA       | DNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 22.5                          |
| 44-16O-b-DNA       | DNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 23.3                          |
| 45-16O-c-DNA       | DNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 23.5                          |
| 4-18O-a-DNA        | DNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 68.6                          |
| 5-18O-b-DNA        | DNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 62.7                          |
| 6-18O-c-DNA        | DNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 57.0                          |
| 28-18O-a-DNA       | DNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 143.0                         |
| 29-18O-b-DNA       | DNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 106.8                         |
| 30-18O-c-DNA       | DNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 103.9                         |
| 40-18O-a-DNA       | DNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 244.4                         |
| 41-18O-b-DNA       | DNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 117.9                         |
| 42-18O-c-DNA       | DNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 118.3                         |
| Salmon sperm DNA-1 | DNA               | NA              | NA                                      | 24.1                          |
| Salmon sperm DNA-2 | DNA               | NA              | NA                                      | 22.7                          |
| Salmon sperm DNA-3 | DNA               | NA              | NA                                      | 23.5                          |
| 7-16O-a-RNA        | RNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 23.7                          |
| 8-16O-b-RNA        | RNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 24.8                          |
| 9-16O-c-RNA        | RNA               | 1 day           | natural abundance $^{18}\text{O}$ water | 24.3                          |
| 31-16O-a-RNA       | RNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 23.1                          |
| 32-16O-b-RNA       | RNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 22.9                          |
| 33-16O-c-RNA       | RNA               | 4 days          | natural abundance $^{18}\text{O}$ water | 23.2                          |
| 43-16O-a-RNA       | RNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 22.9                          |
| 44-16O-b-RNA       | RNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 23.8                          |
| 45-16O-c-RNA       | RNA               | 8 days          | natural abundance $^{18}\text{O}$ water | 23.3                          |
| 4-18O-a-RNA        | RNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 98.4                          |
| 5-18O-b-RNA        | RNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 50.0                          |
| 6-18O-c-RNA        | RNA               | 1 day           | 95 atom % $\text{H}_2^{18}\text{O}$     | 63.0                          |
| 28-18O-a-RNA       | RNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 99.6                          |
| 29-18O-b-RNA       | RNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 100.8                         |
| 30-18O-c-RNA       | RNA               | 4 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 68.5                          |
| 40-18O-a-RNA       | RNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 243.8                         |
| 41-18O-b-RNA       | RNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 118.3                         |
| 42-18O-c-RNA       | RNA               | 8 days          | 95 atom % $\text{H}_2^{18}\text{O}$     | 78.3                          |