**Supplementary information.**

Concentrations and pH used in experiments Q + DP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| quencher | t, °C | pH | C(DP), mM | C(Q), mM |
| GMP(-H)- | 8 | 11.34 | 15 | 9 |
| 11.31 | 15 | 18 |
| 25 | 11.32 | 15 | 7.5 |
| 11.40 | 15 | 15 |
| 45 | 11.38 | 15 | 6.5 |
| 11.37 | 15 | 13 |
| 65 | 11.39 | 15 | 4 (d8-DP) |
| 11.35 | 15 | 8 (d8-DP) |
| NacTyrO- | 8 | 11.72 | 15 | 4 |
| 11.74 | 15 | 8 |
| 25 | 11.71 | 15 | 3 |
| 11.74 | 15 | 6 |
| 45 | 11.76 | 15 | 2.5 |
| 11.73 | 15 | 5 |
| 65 | 11.73 | 15 | 2.5 |
| 11.76 | 15 | 5 |
| TyrO- | 8 | 11.76 | 15 | 4 |
| 11.76 | 15 | 6.5 |
| 15 | 11.73 | 15 | 4 |
| 11.78 | 15 | 6.5 |
| 25 | 11.70 | 15 | 3 |
| 11.85 | 15 | 6 |
| 35 | 11.69 | 15 | 3 |
| 11.69 | 15 | 6 |
| 45 | 11.73 | 15 | 3 |
| 11.75 | 15 | 6 |
| 55 | 11.77 | 15 | 2 |
| 11.76 | 15 | 3.25 |
| 11.74 | 15 | 4.5 |
| 65 | 11.75 | 15 | 1.5 |
| 11.71 | 15 | 2.5 |
| 11.72 | 15 | 3.5 |

GMP(-H)- + TyrO- + DP

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| t, °C | pH | C(DP), mM | C(GMP(-H)-), mM | C(TyrO-), mM |
| 25 | 11.78 | 15 | 4 | 2.5 |
| 11.73 | 15 | 4 | 1.3 |