

Table S4. Compositions and contents of total-ketocarotenoids in HEK293T cells. Data ($\mu\text{g/g}$ DW, gram of dry weight).

| Samples | TOTAL-KETOCAROTEN | MIN-total-keto | SD | Compared to | One way ANOVA, <i>P-values</i> |
|-------------------------|--------------------|--------------------|-----|-------------------------|--------------------------------|
| | $\mu\text{g/g}$ DW | $\mu\text{g/g}$ DW | | | |
| pbK3HZ-2A+beta-carotene | 49.0 | 40.2 | 7.6 | pWZG-2A+beta-carotene | |
| | 34.8 | | | | |
| | 36.9 | | | | |
| pC1HZG-2A+beta-carotene | 56.6 | 55.6 | 7.3 | pbK3HZ-2A+beta-carotene | |
| | 62.4 | | | | |
| | 47.9 | | | | |
| pWZG-2A+beta-carotene | 75.1 | 74.2 | 2.2 | pbK3HZ-2A+beta-carotene | |
| | 71.7 | | | | |
| | 75.8 | | | | |
| pWZg2R-2A+beta-carotene | 88.9 | 90.4 | 1.8 | pWZG-2A+beta-carotene | ** |
| | 92.4 | | | | |
| | 90.0 | | | | |
| pWZg1R-2A+beta-carotene | 140.4 | 140.2 | 5.5 | pWZG-2A+beta-carotene | *** |
| | 145.6 | | | | |
| | 134.6 | | | | |
| pPLXG+pWZg1R | 38.2 | 43.5 | 5.9 | pPYLG+pWZg1R | |
| | 42.4 | | | | |
| | 49.9 | | | | |
| pAPLG+pWZg1R | 50.8 | 51.7 | 1.7 | pPLXG+pWZg1R | |
| | 53.7 | | | | |
| | 50.8 | | | | |
| pPYLG+pWZg1R | 59.6 | 63.2 | 3.1 | pPLXG+pWZg1R | ** |
| | 65.3 | | | | |
| | 64.8 | | | | |
| pPLXG+pWZg1R+GGPP | 78.4 | 74.9 | 4.2 | pPLXG+pWZg1R | ** |
| | 70.2 | | | | |
| | 76.0 | | | | |
| pAPLG+pWZg1R+GGPP | 119.7 | 124.4 | 5.0 | pAPLG+pWZg1R | *** |
| | 123.7 | | | | |
| | 129.8 | | | | |
| pPYLG+pWZg1R+GGPP | 212.6 | 207.2 | 5.1 | pPYLG+pWZg1R | *** |
| | 202.4 | | | | |
| | 206.5 | | | | |
| pPLXG+pWZg1R+ZR+GGPP | 161.1 | 154.6 | 7.3 | pPLXG+pWZg1R | *** |
| | 146.7 | | | | |
| | 156.0 | | | | |
| pAPLG+pWZg1R+ZR+GGPP | 191.6 | 196.0 | 7.7 | pAPLG+pWZg1R | *** |
| | 191.5 | | | | |
| | 204.8 | | | | |
| pPYLG+pWZg1R+ZR+GGPP | 267.1 | 262.1 | 4.3 | pPYLG+pWZg1R | *** |

| | | | | | |
|--|-------|--|--|--|--|
| | 259.0 | | | | |
| | 260.2 | | | | |

P < 0.05, P < 0.01 and P < 0.001 are tagged as *, **, and ***, respectively. ND, not detectable. The total-ketocarotenoids is the sum of E (*trans*) and Z (*cis*) isomers.